COUNTY OF SANTA CRUZ

PLANNING DEPARTMENT
701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123
KATHLEEN MOLLOY PREVISICH, PLANNING DIRECTOR
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MITIGATED NEGATIVE DECLARATION

Project: Lewis Land Division **APN: 049-121-23**

Project Description: This is a proposal to divide a 17.6 acre parcel into two parcels of 4.18 and 13.39 gross acres. Geotechnical and Geologic report reviews were completed under permit 06-0461. Requires a Minor Land Division, an Agricultural Viability Study, and a Riparian Exception to replace a culvert within a riparian corridor.

Project Location: 711 Larkin Valley Road, Watsonville, CA

Owner: Nathan A. and Debra A. Lewis, Trustees

Applicant: Steve Graves

Staff Planner: Robin Bolster-Grant, (831) 454-5357

Email: pln111@co.santa-cruz.ca.us

This project will be considered at a public hearing by the Santa Cruz County Planning Commission. The time, date and location have not been set. When scheduling does occur, these items will be included in all public hearing notices for the project.

California Environmental Quality Act Mitigated Negative Declaration Findings:

Find, that this Mitigated Negative Declaration reflects the decision-making body's independent judgment and analysis, and; that the decision-making body has reviewed and considered the information contained in this Mitigated Negative Declaration and the comments received during the public review period; and, that revisions in the project plans or proposals made by or agreed to by the project applicant would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur; and, on the basis of the whole record before the decision-making body (including this Mitigated Negative Declaration) that there is no substantial evidence that the project as revised will have a significant effect on the environment. The expected environmental impacts of the project are documented in the attached Initial Study on file with the County of Santa Cruz Clerk of the Board located at 701 Ocean Street, 5th Floor, Santa Cruz, California.

Review Period Ends: November 1, 2012

Note: This Document is considered Draft until it is Adopted by the Appropriate County of Santa Cruz Decision-Making Body

Date: October 9/2012

Matt Johnston

MATT JOHNSTON, Environmental Coordinator
(831) 454-3201

County of Santa Cruz

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ENVIRONMENTAL COORDINATOR

NOTICE OF INTENT TO ADOPT A NEGATIVE DECLARATION

NOTICE OF PUBLIC REVIEW AND COMMENT PERIOD

Pursuant to the California Environmental Quality Act, the following project has been reviewed by the County Environmental Coordinator to determine if it has a potential to create significant impacts to the environment and, if so, how such impacts could be solved. A Negative Declaration is prepared in cases where the project is determined not to have any significant environmental impacts. Either a Mitigated Negative Declaration or Environmental Impact Report (EIR) is prepared for projects that may result in a significant impact to the environment.

Public review periods are provided for these Environmental Determinations according to the requirements of the County Environmental Review Guidelines. The environmental document is available for review at the County Planning Department located at 701 Ocean Street, in Santa Cruz. You may also view the environmental document on the web at www.sccoplanning.com under the Planning Department menu. If you have questions or comments about this Notice of Intent, please contact Matt Johnston of the Environmental Review staff at (831) 454-3201

The County of Santa Cruz does not discriminate on the basis of disability, and no person shall, by reason of a disability, be denied the benefits of its services, programs or activities. If you require special assistance in order to review this information, please contact Bernice Romero at (831) 454-3137 (TDD number (831) 454-2123 or (831) 763-8123) to make arrangements.

PROJECT: LEWIS LAND DIVISION

APP #: 10-0030

APN(S): 049-121-23

PROJECT DESCRIPTION: This is a proposal to divide a 17.6 acre parcel into two parcels of 4.18 and 13.39 gross acres. Geotechnical and Geologic report reviews were completed under permit 06-0461. Requires a Minor Land Division, an Agricultural Viability Study, and a Riparian Exception to replace a culvert within a riparian corridor.

EXISTING ZONE DISTRICT: Agriculture (A)
APPLICANT: Steve Graves
OWNER: Nathan A. and Debra A. Lewis, Trustees
PROJECT PLANNER: Robin Bolster-Grant, (831) 454-5357
EMAIL: pln111@co.santa-cruz.ca.us
ACTION: Negative Declaration with mitigations
REVIEW PERIOD: October 12, 2012 through November 1, 2012
This project will be considered at a Public Hearing by the Planning Commission. The time, date and location have not been set. When scheduling does occur, these items will be included in all public hearing notices for the project.

NAME: Nathan and Deborah Lewis
APPLICATION: 10-0030
A.P.N: 049-121-23

NEGATIVE DECLARATION MITIGATIONS

A. In order to mitigate potential impacts to Monterey spineflower and San Andreas oak woodland (SAOW), the following mitigation measures shall be made conditions of approval for any development resulting from the proposed lot split:

1. To ensure clearing for fire safety does not impact the SAOW, no structures may be constructed within 100 feet of the drip line of the SAOW.
2. Prior to disturbance on the new building site, construction fencing shall be installed to prevent accidental incursion into Monterey Spineflower or SAOW. The fence location shall be verified in the field by the project biologist.
3. The recommendations of the Habitat Management Plan by John Gilchrist & Associates (6/28/11) shall be incorporated into the conditions of approval.

B. In order to mitigate impacts to Santa Cruz long-toed salamanders, the following mitigation measures are required and would be incorporated into the conditions of project approval:

1. Restricting grading, vegetation removal and construction to outside of the designated disturbance envelope, with the development envelope perimeter demarcated by orange construction fencing prior to the start of construction;
2. Prior to any vegetation removal a qualified biologist shall conduct a pre-construction education session with the work crew, to address SCLTS status, history, identification and protection measures, particularly to ensure no impacts during rainy season construction;
3. Initial vegetation removal shall be conducted by hand-held tools and machinery;
4. A monitoring biologist shall be present during vegetation removal;
5. Prohibit winter grading and fill all trenches and pits prior to October 15th of any year.

C. In order to mitigate impacts of nighttime lighting on the adjacent riparian and SAO woodland habitats, the applicant or property owner shall submit an exterior lighting plan for review and approval by the Planning Department prior to building permit issuance which shows: all exterior lighting directed away from wooded areas and adjacent properties; light sources shielded by landscaping, fixture design or other physical means; and all exterior lighting utilizing high-pressure sodium vapor, metal halide, fluorescent, or equivalent energy-efficient fixtures.

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CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) ENVIRONMENTAL REVIEW INITIAL STUDY

Date: October 3, 2012 **Application Number:** 10-0030

Staff Planner: Robin Bolster-Grant

I. OVERVIEW AND ENVIRONMENTAL DETERMINATION

APPLICANT: Steve Graves **APN(s)**: 049-121-23

OWNER: Lewis Nathan A & Debra A Trustees **SUPERVISORAL DISTRICT**: 2

PROJECT LOCATION: Property located at the south side of Larkin Valley Road about 1.5 miles west of Buena Vista Drive (711 Larkin Valley Road).

SUMMARY PROJECT DESCRIPTION: Proposal to divide a 17.6 acre parcel into two parcels of 4.18 and 13.39 gross acres. Geotechnical and Geologic report reviews were completed under permit 06-0461. Requires a Minor Land Division, an Agricultural Viability Study, and a Riparian Exception to replace a culvert within a riparian corridor.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED: All of the following potential environmental impacts are evaluated in this Initial Study. Categories that are marked have been analyzed in greater detail based on project specific information.

- ☒ Geology/Soils
- ☒ Hydrology/Water Supply/Water Quality
- ☒ Biological Resources
- ☒ Agriculture and Forestry Resources
- ☐ Mineral Resources
- ☐ Visual Resources & Aesthetics
- ☒ Cultural Resources
- ☐ Hazards & Hazardous Materials
- ☐ Transportation/Traffic
- ☐ Noise
- ☐ Air Quality
- ☐ Greenhouse Gas Emissions
- ☐ Public Services
- ☐ Recreation
- ☐ Utilities & Service Systems
- ☒ Land Use and Planning
- ☐ Population and Housing
- ☐ Mandatory Findings of Significance

DISCRETIONARY APPROVAL(S) BEING CONSIDERED:

- ☐ General Plan Amendment
- ☒ Land Division
- ☐ Rezoning
- ☐ Development Permit
- ☐ Coastal Development Permit
- ☐ Grading Permit
- ☒ Riparian Exception
- ☐ Other:

NON-LOCAL APPROVALS

Other agencies that must issue permits or authorizations: None

DETERMINATION: (To be completed by the lead agency)
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 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 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.

Matthew Johnston
Environmental Coordinator

10/4/12
Date

II. BACKGROUND INFORMATION

EXISTING SITE CONDITIONS

Parcel Size: 17.75 acres
Existing Land Use: Residential
Vegetation: San Andreas Oak Woodland at the rear portion of the parcel; Ben Lomond spineflower identified on-site; riparian corridor and vegetation located at northwest property line.
Slope in area affected by project: ☒ 0 - 30% ☐ 31 – 100%
Nearby Watercourse: Intermittent tributary to Harkins Slough located at parcel frontage along Larkin Valley Road; Gallighan Slough located across Highway 1 about 3023 feet to the south; Corralitos Creek located about 1.7 miles to the east.

ENVIRONMENTAL RESOURCES AND CONSTRAINTS

Water Supply Watershed: Not Mapped
Groundwater Recharge: Mapped at parcel frontage; additional evaluation determined groundwater recharge area to be located at the rear of the parcel.
Timber or Mineral: Not Mapped

Agricultural Resource: Not a mapped agricultural resource area; front portion of parcel designated as Agriculture in the County General Plan.
Biologically Sensitive Habitat: Ben Lomond spineflower and San Andreas Oak Woodland identified on parcel; riparian corridor located at the northwest portion of the parcel and along parcel frontage.
Fire Hazard: Rear portion of the parcel mapped as Fire Hazard Area.
Floodplain: Front portion of parcel along Larkin Valley Road located with 100 year flood zone
Erosion: Not Mapped

Landslide: Front portion of property located within a mapped landslide area.
Liquefaction: Proposed development area mapped as high liquefaction.

Fault Zone: Not Mapped
Scenic Corridor: Not Mapped

Historic: No historic resources present on site.
Archaeology: Front portion of property including proposed building area mapped for archaeological resources.

Noise Constraint: None

Electric Power Lines: Along parcel frontage at Larkin Valley Road.
Solar Access: Potential for solar access at proposed building site.

Solar Orientation: Potential for future construction to take advantage of southern solar access.
Hazardous Materials: None

Other: None

SERVICES

Fire Protection: Cal Fire
School District: Pajaro Valley USD

Drainage District: None
Project Access: Via Big Tree Lane

Sewage Disposal: Septic

Water Supply: Private well

PLANNING POLICIES

Zone District: Agriculture (A)

Special Designation: None

General Plan: Rural Residential (R-R); Agriculture (AG)

Urban Services Line: ☐ Inside ☒ Outside

Coastal Zone: ☐ Inside ☒ Outside

ENVIRONMENTAL SETTING AND SURROUNDING LAND USES:

The parcel is located on the south side of Larkin Valley Road. There is a tributary to Harkin Slough along the frontage of the parcel at Larkin Valley Road and a portion of the property along the drainage path is designated as within the FEMA 100-year flood zone.

The front portion of the parcel is mapped as a Primary Groundwater Recharge area; however, County review of the submitted Hydrogeologic Report in 2010 as a part of application #REV06-0461indicates that the rear (southern) portion of the property is an area of primary groundwater recharge and that the front (northern) portion is not an area of primary groundwater recharge (Attachment 7).

A 60 foot wide riparian corridor begins near the center of the property at about 320 feet from the rear (south) property line. The corridor then runs west where is follows the west property line for a distance of approximately 800 feet at which point it crosses through the parcel towards the east property line, then to the Harkin Slough tributary at Larkin Valley Road.

At about 800 feet south of the front property line, the parcel begins to support San Andreas Oak Woodland habitat, which is a protected habitat in the County General Plan. The extent of the habitat was confirmed through site visits and it has been determined by County staff that the "transitional" area depicted on the project plans is an area which previously supported San Andreas Oak Woodland habitat and was cleared at some point in time, and is now in transition back to the oak woodland habitat.

During a site visit in 2010, the County's consulting biologist, Ecosystems West, identified a large patch of Monterey spineflower (*Chorizanthe pungens* ssp. *pungens)* located approximately 824 feet south of the front property line at the center of the parcel about 176 feet from the east and west property lines.

The proposal is to divide the existing 17.57 acre parcel into two parcels of 4.18 gross acres (Parcel A) and 13.39 gross acres (Parcel B). There is an existing single family residence which would remain on Parcel A and a development envelope located outside of the riparian corridor, Monterey spineflower habitat and San Andreas Oak Woodland habitat has been identified on Parcel B. Parcel B would take access from Big Tree Lane which Parcel A would continue to take access from Larkin Valley Road.

PROJECT BACKGROUND:

In 2004, the property owner applied for a Minor Land Division permit to divide the existing parcels into three parcels of approximately 5.3 acres, 5 acres, and 7.3 acres (#04-0273). The proposed third parcel was to be located south of the currently proposed Parcel B, within an area that has been determined to support San Andreas Oak Woodland habitat, which is defined as a Special Forest in the County's Sensitive Habitat Protection Ordinance (Chapter 16.32). A Rural Residential Density Matrix was completed as a part of the land division to determine the potential number of building sites based on existing constraints and resources. At the time, the Rural Residential Density Matrix resulted in a minimum parcel size of 15 acres, which could not support a division of the 17.5 gross acre parcel. The results of the Rural Matrix were based on indications of high groundwater, high liquefaction potential, steep slopes and mapped landslide areas on the parcel, and the existence of sensitive habitat within proposed building sites. The application was withdrawn by the applicant.

In 2006, the applicant applied for a Soils Report Review and a Geologic Report Review (#06-0461). The reports were accepted by the County Geologist and concluded that:

- The proposed development envelopes associated with Parcels A and B are outside of Primary Groundwater Recharge areas;
- The rear (southern) portion of the parcel is within a Primary Groundwater Recharge Area.
- The lower (northern) portion of the site is not located within the toe of an old landslide as mapped in the County's Geographic Information System and that the potential health and safety impacts associated with a new shallow landslide can be mitigated by foundation design and construction recommendations.
- That the potential for liquefaction of the surface materials at the proposed building sites during a strong earthquake is low.
- That the slopes under the proposed building locations are stable under static and seismic conditions.

With the acceptance of these documents, the applicant submitted a subsequent proposal for a Minor Land Division which was essentially the same proposal submitted in 2004. Although the application addressed many of the geologic concerns, the proposed configuration of the three lot split was found to be in conflict with the density requirements in General Plan Policy 5.1.5 (Land Divisions and Density Requirements in Sensitive Habitats), given the existence of San Andreas Oak Woodland in the proposed location of Parcel C. The applicant revised the plans in 2011 to depict a proposal for a two lot land division with both parcels and building areas clustered outside of sensitive habitat areas and a Habitat Management Plan to upgrade special forest areas located outside of mapped areas through resource management activities. The revised submittal complies with the requirements of General Plan Policy 5.1.5 and the minimum parcel size determined by a revised Rural Matrix (Attachment 16).

DETAILED PROJECT DESCRIPTION:

The proposal is to divide the existing 17.57 acre parcel into two parcels of 4.18 acres (Parcel A) and 13.39 acres (Parcel B).

The County General Plan designates the front portion of the parcel (along Larkin Valley Road) as Agriculture (AG) and the rear portion of the parcel as Rural Residential (R-R). The parcel is not designated as a Type 1, Type 2, or Type 3 Agricultural Resource in the County General Plan. The entire parcel has an implementing zone district of Agriculture (A).

The minimum average parcel size as determined by the Rural Matrix is 5 acres (Attachment 11), however, County Code Section 13.14.030 allows for the averaging of parcel sizes which allows for the creation of a parcel which is less than 5 acres in size.

County Code Section 16.50.085 (Protection of noncommercial agricultural land) requires that divisions of land which are designated as Agriculture (AG) in the County General Plan, but which are not designated as Type 1, Type 2, or Type 3 commercial agricultural land, maintain a minimum parcel size of ten (10) to forty (40) acres. The Code provides an exception to this requirement to allow for parcels to be created within the 2.5 to twenty (20) acre range with confirmation from the Agricultural Policy Advisory Commission (APAC) that such land is not viable for a commercial agricultural use. The applicant obtained this acceptance from the APAC on July 19, 2012 (Attachment 17).

There is an existing single family dwelling on Parcel A which takes access from Larkin Valley Road and shall remain as a result of the land division. No additional development is proposed on Parcel A. There is a proposed building envelope on Parcel B, which is located outside of the Monterey spineflower and San Andreas Oak Woodland Habitat and outside of delineated riparian areas. Parcel B will take access from Big Tree Lane. A Neighbor Access Agreement will be recorded to allow for the parcel to legally utilize the secondary access road. Additionally, a driveway easement will be required to be recorded prior to parcel map recordation to allow for the driveway to Parcel B to cross over Parcel A.

A 15" culvert currently exists on Parcel A and is located under the driveway to Parcel B. A Drainage Investigation, prepared by Roper Engineering (dated April 13, 2011) indicates that this 15" culvert is undersized to handle drainage during a 10-year storm event. Given that the culvert is a "shared" improvement between both proposed parcels (located on Parcel A and serving Parcel B) and that the use of the driveway served by the culvert will be intensified as a result of the project, the replacement of the culvert with two 24" culverts is required to be completed as a part of the project. A riparian exception is required to replace the culvert within the existing riparian corridor.

III. ENVIRONMENTAL REVIEW CHECKLIST

A. GEOLOGY AND SOILS

Would the project:

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
1. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
A. 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 Publication 42.	☐	☐	☒	☐
B. Strong seismic ground shaking?	☐	☐	☒	☐
C. Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
D. Landslides?	☐	☐	☒	☐

Discussion (A through D): The project site is located outside of the limits of the State Alquist-Priolo Special Studies Zone (County of Santa Cruz GIS Mapping, California Division of Mines and Geology, 2001). However, the San Andreas fault zone is located approximately 6 miles northeast of the project site and the nearest trace of the Zayante fault is mapped approximately 2 ¾ miles northeast of the project site. While the San Andreas fault is larger and considered more active, each fault is capable of generating moderate to severe ground shaking from a major earthquake. Consequently, large earthquakes can be expected in the future. The October 17, 1989 Loma Prieta earthquake (magnitude 7.1) was the second largest earthquake in central California history. A geologic investigation for the project was prepared by UPP Geotechnology, Inc., dated May 19, 2005 (Attachment 3), and a geotechnical investigation was prepared by Dees and Associates, Inc., dated August 2006 (Attachment 4). These reports have been reviewed and accepted by the Environmental Planning Section of the Planning Department (Attachment 5). The reports conclude that fault rupture would not be a potential threat to the proposed development, and that seismic shaking can be managed by designing the structures in accordance with the most current seismic design codes and by following the recommendations in the geologic and

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

geotechnical reports referenced above.

The geologic investigation showed no evidence of recent landsliding on the property in the proposed building areas (which are consistent with the currently proposed building sites) and also indicates that the landslide mapped at the base of the slope in the vicinity of the existing residence is an alluvial fan and not a landslide. The report also indicates that because of the moderate slopes and the layer of non-supportive colluvial soils that blankets the proposed building sites, the occurrence of a new shallow landslide associated with excessive precipitation or strong ground shaking in the proposed building areas cannot be excluded. The reports conclude that potential landslides of this nature should not constitute an immediate threat to the integrity of the proposed residences and associated improvements, provided that they are designed and constructed in accordance with the reports' recommendations.

The submitted geologic report indicates that groundwater was encountered at depths of near 20 feet in the proposed building sites which would reduce the potential for liquefaction to occur; however the geotechnical report indicates that some of the submerged sands have a potential to liquefy during the a design earthquake. The report provides recommendations for foundation construction to reduce the impact of settlement of liquefied soils which could occur during a design earthquake.

2.	Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☒	☐

Discussion: See response to A.1.A-D above. The reports cited above concluded that there is a potential risk of landsliding or liquefaction associated with extreme precipitation and/or seismic shaking. The geotechnical report indicates that lateral spreading is not anticipated at the site due to the depth of the liquefiable soils in relation to the slope and subsidence was not identified as a potential geologic hazard at the site. The recommendations contained in the geotechnical and geologic reports will be implemented to reduce this potential hazard to a less than significant level.

3.	Develop land with a slope exceeding 30%?	☐	☐	☐	☒

Discussion: There are slopes that exceed 30% on the property, however, no improvements are proposed on slopes in excess of 30%.

4.	Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐

Discussion: Some potential for erosion exists during the construction phase of the project; however, this potential is minimal because standard erosion controls are a required condition of the project. Prior to approval of a grading or building permit, the

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

project must have an approved Erosion Control Plan, which will specify detailed erosion and sedimentation control measures. The plan will include provisions for disturbed areas to be planted with ground cover and to be maintained to minimize surface erosion.

5. Be located on expansive soil, as defined in Section 1802.3.2 of the California Building Code (2007), creating substantial risks to life or property?	☐	☐	☒	☐

Discussion: There is no indication that the development site is subject to substantial risk caused by expansive soils.

6. Place sewage disposal systems in areas dependent upon soils incapable of adequately supporting the use of septic tanks, leach fields, or alternative waste water disposal systems where sewers are not available?	☐	☐	☒	☐

Discussion: The proposed project would use an onsite sewage disposal system, and County Environmental Health Services has determined that site conditions are appropriate to support such a system.

7. Result in coastal cliff erosion?	☐	☐	☐	☒

Discussion: The proposed project is not located in the vicinity of a coastal cliff or bluff; and therefore, would not contribute to coastal cliff erosion.

B. HYDROLOGY, WATER SUPPLY, AND WATER QUALITY
Would the project:

1. Place development 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?	☐	☐	☒	☐

Discussion: According to the Federal Emergency Management Agency (FEMA) National Flood Insurance Rate Map, dated March 2, 2006, a small portion of the project site at the frontage of Larking Valley Road lies within a 100-year flood hazard area. There are no improvements or structures proposed as a part of the project that are located within the mapped 100-year flood hazard area.

2. Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☒	☐

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

Discussion: See response to B-1 above.

3.	Be inundated by a seiche, tsunami, or mudflow?	☐	☐	☐	☒

Discussion: The parcel is not located within the vicinity of a large body of water.

4.	Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would 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 would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☒	☐

Discussion: The project would rely on a private well for water supply. In 2010, Environmental Planning staff accepted a Hydrogeologic Report (Attachment 7) prepared by UPP Geotechnology, Inc., which indicates that the majority of the lower portion of the subject parcel is not in an area of primary groundwater recharge as defined by the county and that the upper portion of the property, where development is not proposed as a part of the project, does qualify as primary groundwater recharge under the County definition. A 15" culvert is currently located on Parcel A and extends under the driveway to Parcel B. The Drainage Investigation, prepared by Roper Engineering (Attachment 10) indicates that this culvert is undersized for the area and will not accommodate a 10-year storm event. Replacement of the undersized 15" culvert is included in this proposal. According to the "On-Site Retention of Collected Runoff" analysis performed by Dees & Associates (Attachment 19) the newly created parcel will be able to accomplish retention of stormwater runoff through a combination of percolation and onsite storage. Drainage Calculations were prepared by Roper Engineering, dated April 13, 2011 (Attachment 10) and the report indicates that the post-development runoff rate will not exceed the existing pre-development rate. The Stormwater Management Section of the Department of Public Works has reviewed and accepted the Drainage Calculations and will review the drainage facilities for the newly created lot to ensure conformance with established design criteria prior to issuance of any building permits.

The proposed storm water runoff enhancements will ensure that the increase in impervious surfaces represented by the project will not significantly impact groundwater supplies or interfere with groundwater recharge.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
5. Substantially degrade a public or private water supply? (Including the contribution of urban contaminants, nutrient enrichments, or other agricultural chemicals or seawater intrusion).	☐	☐	☒	☐

Discussion: The project would not discharge runoff either directly or indirectly into a public or private water supply. However, runoff from this project may contain small amounts of chemicals and other household contaminants. No commercial or industrial activities are proposed that would contribute contaminants. Potential siltation from the proposed project will be addressed through implementation of erosion control measures.

6. Degrade septic system functioning?	☐	☐	☒	☐

Discussion: There is no indication that existing septic systems in the vicinity would be affected by the project.

7. 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 would result in flooding, on- or off-site?	☐	☐	☒	☐

Discussion: The proposed area of development is approximately 300 feet from a watercourse; however the project would not significantly alter the existing overall drainage pattern of the site. In addition to replacing the existing undersized 15" culvert with two 24" culverts, the newly created parcel will use the existing unpaved driveway. The proposed building envelope would be located 500 feet upslope from the intermittent stream and conditions of project approval require the submittal of an engineered drainage plan prior to any future construction on the newly created lot. The drainage plans would be required to include percolation trenches, bioswales, or other best management practices of stormwater retention to ensure that the stream is not significantly impacted by increased rates of stormwater runoff or erosion. The engineered drainage plan will be required to be reviewed and approved by the Stormwater Management Section of the Department of Public Works and by Environmental Planning staff.

8. Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems, or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

***Discussion*:**

Drainage Calculations prepared by Roper Engineering dated April 13, 2011, have been reviewed for potential drainage impacts and accepted by the Department of Public Works (DPW) Stormwater Management Section staff. The calculations show that the three culverts along Larkin Valley Road are undersized and are expected to overtop the adjacent roadways during a 10-year storm event. Of the three existing culverts that accommodate runoff from the subject parcel, only one – the 15" culvert – is located within the parcel boundaries. As a part of the proposed subdivision this 15" culvert would be replaced by two 24" culverts, which will ensure that no significant impacts to the drainage system would result from the creation of a second parcel and building site. The runoff rate from the property would be controlled by future retention systems, including bioswales and or percolation pits and the conditions of approval require these features to be reviewed and approved prior to any new development on the newly created parcel. No additional development is proposed on the second parcel that will contain the existing single-family dwelling. Refer to response B-5 for discussion of urban contaminants and/or other polluting runoff.

9.	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?	☐	☐	☒	☐

***Discussion*:** The proposal includes the replacement of an undersized 15" culvert with two 24" culverts, which will reduce the impacts due to flooding associated with the creation of a new parcel and building site, to a less than significant level.

10.	Otherwise substantially degrade water quality?	☐	☐	☒	☐

***Discussion*:** Project conditions of approval require the incorporation of best management practices and stormwater retention methods to treat development runoff onsite, prior to the approval of any future building permits. These measures will reduce any impacts of future development on water quality to a less than significant level.

C. BIOLOGICAL RESOURCES

Would the project:

1.	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 Game, or U.S. Fish and Wildlife	☐	☒	☐	☐

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

Service?

Discussion: A Biotic Review for this project was performed by John Gilchrest & Associates, dated February 23, 2010 and revised on June 28, 2010 (Attachment 11) The Gilchrist report has been reviewed by EcoSystems West (Attachment 12). Gilchrist found that the oak woodland on site did not contain the diversity of native plant species normally associated with San Andreas Oak Woodland (SAOW), habitat which is designated as sensitive habitat in the Santa Cruz County General Plan. However, the EcoSystems West review of the Gilchrist report asserted that the best indicator for SAOW is an association with baywood loamy sands and that the woodland on the subject site is "transitional SAOW." In addition, EcoSystems West observed a patch of Monterey spineflower, a federally listed threatened species, on the site.

The County Environmental Coordinator reviewed both reports (Attachment 13) and determined that the oak woodland on site is consistent with transitional San Andreas Oak Woodland, and therefore warrants protection from development. In response, the project has been revised from the original three lots to the creation of just two lots.

In response to the EcoSystems report, a Habitat Management Plan was prepared by John Gilchrist & Associates (Attachment 14), which provides management recommendations for both the SAOW and the Monterey spineflower.

In order to minimize significant impact to the protected habitat, the present proposal provides for a new building envelope that is located outside of the oak woodland located at the southwestern portion of the lot. The development will be clustered away from the oaks and, a "non-development buffer" is delineated on the Tentative Map to ensure that future development does not impact the oak woodland areas to the southwest. All structures would be required to maintain a 100-foot buffer from the San Andreas Oak Woodland to ensure that fire clearance requirements do not impact the habitat. In addition to these measures, the following additional recommendations, included in the Habitat Management Plan, would be incorporated into the project conditions of approval:

- Install a permanent low fence around the Monterey spineflower area. The fence should not restrict animal movement in and out but should prevent the inadvertent incursion of vehicles or heavy equipment. A single perimeter wire with stakes is sufficient.

- If mowing is necessary for fire protection, it shall be conducted in early spring (March) before flowering, or in later summer after spineflower becomes senescent. Mowing height shall be set above 5".

- Propagate coast live oak from seed found at the site or within 3 miles of the site. Six to eight oaks shall be planted within the larger openings in the SAOW. After planting, install mesh screening around each plant to protect against herbivores. Screens may have to be adjusted as plants grow, and removed when plants reach a height where deer cannot browse them Planting should occur in the fall, and the new oaks irrigated once a month for 2 years during the dry season with

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

a drip irrigation system.

- Remove existing invasive non-native vegetation. The harding grass should be mowed in late spring and then spot treated with a 2 percent solution of glyphosate. Care must be taken not to overspray into oaks or other native vegetation. The three French broom plants should be removed by hand in winter 2012 prior to flowering. If additional broom plants are found in later years, they should also be removed when they are seedlings.

- Annually in the spring, survey the SAOW for eucalyptus seedlings or sprouts and remove any small plants found.

- A revegetation ecologist or botanist should flag low growing oak seedlings and other small natives so that they can be avoided during mowing activity, harding grass removal or any other activity that may impact native species.

- Monitoring inspection by a native plant revegetation specialist should occur during plant installation and once during the first year after installation. Yearly inspection is required during the years 2 and 3. Recommendations made during monitoring visits should be incorporated into the maintenance program below.

- A revegetation maintenance program is required for a period of at least 3 years after completion of plant installation. The specific maintenance tasks are:

    1) Conduct routine maintenance of the irrigation system
    2) Remove trash and debris that may hinder vegetation establishment
    3) Review plantings for herbivore damage and add or modify screens as necessary.
    4) Remove any invasive non-native vegetation and assist with long range planning for eucalyptus, harding grass and French broom removal.
    5) Replace any planted oaks that do not survive the first two years
    6) Maintain complete notes on maintenance activities and dates.

In addition to these mitigation measures, a Biotic Deed Restriction will be required to be recorded prior to recording the Parcel Map for the minor land division. The deed restriction will memorialize the non-development buffer.

The site also contains mapped and non-mapped riparian areas. A mapped intermittent stream is located along Larkin Valley Road to the northeast, and an unmapped riparian corridor exists along the northwest portion of the parcel. A Site Assessment was performed by Bryan M. Mori, dated August 5, 2004, to evaluate the potential for Santa Cruz long-toed salamander (SCLTS), a federally listed endangered species, to occur on the site. This report was also based on the original proposal for the creation of three lots, rather than the two currently proposed. According to the SCLTS assessment two breeding ponds occur within one mile of the project site and nine *potential* breeding ponds occur within one mile of the site. Intermittent, shallow flow was

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

observed in the drainage on the property; however SCLTS individuals require quiet waters and have not been documented to reproduce within creeks. The site does contain potential upland habitat, therefore several recommendations were included in the SCLTS assessment which would minimize impacts of the development on SCLTS individuals and habitat.

The following mitigation measures are required and would be incorporated into the conditions of project approval:

- Restricting grading, vegetation removal and construction to outside of the designated disturbance envelope, with the development envelope perimeter demarcated by orange construction fencing prior to the start of construction;
- Prior to any vegetation removal a qualified biologist shall conduct a pre-construction education session with the work crew, to address SCLTS status, history, identification and protection measures, particularly to ensure no impacts during rainy season construction.
- Initial vegetation removal conducted by hand-held tools and machinery
- Ensure a monitoring biologist is present during vegetation removal.
- Prohibit winter grading and fill all trenches and pits prior to October 15th of any year.

All recommendations made by project biotic consultants have been incorporated into the project conditions of approval and/or are shown on the proposed Tentative Map for the project. Compliance with these biotic recommendations and designation of the recommended Development Envelope will ensure that potential impacts to protected species and habitat is reduced to a less than significant level.

2.	Have a substantial adverse effect on any riparian habitat or sensitive natural community identified in local or regional plans, policies, regulations (e.g., wetland, native grassland, special forests, intertidal zone, etc.) or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☒	☐

Discussion: The parcel contains riparian habitat along the northwest boundary and at the frontage. The newly created parcel conforms to a development envelope that restricts future improvements to a designated building envelope located away from the riparian corridor. The existing driveway, which crosses a portion of the riparian area, will continue to serve the existing and future development. While the additional building envelope may require the existing driveway to be slightly extended, this will occur away from the riparian corridor. The project includes the replacement of an existing

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

undersized 15" culvert with two new 25-foot sections of 24" HDPE culvert. The culvert replacement will enhance the drainage system functioning and protect the property from flooding. The culvert replacement is conditioned to occur during the dry season to provide minimal impact to the functioning of the riparian corridor. Conditions of approval will also require submittal of an erosion control plan be submitted in conjunction with the culvert replacement.

3. 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 or migratory wildlife nursery sites?	☐	☐	☒	☐

Discussion: The proposed culvert replacement and future development of the newly created parcel does not involve any activities that would interfere with the movements or migrations of fish or wildlife, or impede use of a known wildlife nursery site.

4. Produce nighttime lighting that would substantially illuminate wildlife habitats?	☐	☒	☐	☐

Discussion: The development area is adjacent to a riparian corridor, which could be adversely affected by a new or additional source of light that is not adequately deflected or minimized. A condition of project approval would require the applicant or property owner to submit an exterior lighting plan for review and approval by the Planning Department prior to building permit issuance which shows: all exterior lighting directed away from wooded areas and adjacent properties; light sources shielded by landscaping, fixture design or other physical means; and all exterior lighting utilizing high-pressure sodium vapor, metal halide, fluorescent, or equivalent energy-efficient fixtures. Compliance with this condition will ensure that impacts to wildlife habitats due to nighttime illumination would be reduced to a less than significant level.

5. 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?	☐	☐	☐	☒

Discussion: There are no mapped wetlands or observed wetlands on the subject parcel.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
6. Conflict with any local policies or ordinances protecting biological resources (such as the Sensitive Habitat Ordinance, Riparian and Wetland Protection Ordinance, and the Significant Tree Protection Ordinance)?	☐	☐	☒	☐

Discussion: The proposed culvert replacement will require a Riparian Exception to allow construction within a riparian corridor. This part of the project will be conditioned to comply with all requirements of the Riparian and Wetland Protection Ordinance by utilizing best management practices for erosion and sediment control and restricting the work to the dry season.

7. 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: The proposed project would not conflict with the provisions of any adopted Habitat Conservation Plan Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. Therefore, no impact would occur.

D. AGRICULTURE AND FOREST 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 Department 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. Would the project:

1. 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?	☐	☐	☒	☐

Discussion: The project site does not contain any lands designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance as shown on the

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency. To ensure that the development would not impact agricultural resources of local importance, an Agricultural Viability Study was prepared on April 2011 (Attachment 17) to address the agricultural viability of the subject parcel. The study concluded that the subject parcel is not viable for agriculture based on the site soils' lack of adequate drainage and the location of existing development on the site. The Agricultural Viability Study was approved by the Agricultural Policy Advisory Committee on July 19, 2012

2.	Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☒	☐

Discussion: See comments under D-2 above.

3.	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))?	☐	☐	☐	☒

Discussion: No forest land occurs on the project site or in the immediate vicinity. No impact is anticipated.

4.	Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒

Discussion: See response D-3 above.

5.	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 parcel containing mapped Agricultural Resources is located approximately 0.2 miles northeast of the project site. No development is proposed that would change the environment or extend any roads or other facilities such that is would impact agricultural resources in the vicinity of the project site; therefore, no impacts are anticipated

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

E. MINERAL RESOURCES

Would the project:

1.	Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒

Discussion: The site does not contain any known mineral resources that would be of value to the region and the residents of the state. Therefore, no impact is anticipated from project implementation.

2.	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: The project site is zoned Agriculture, which is not considered to be an Extractive Use Zone (M-3) nor does it have a Land Use Designation with a Quarry Designation Overlay (Q) (County of Santa Cruz 1994). Therefore, no potentially significant loss of availability of a known mineral resource of locally important mineral resource recovery (extraction) site delineated on a local general plan, specific plan or other land use plan would occur as a result of this project.

F. VISUAL RESOURCES AND AESTHETICS

Would the project:

1.	Have an adverse effect on a scenic vista?	☐	☐	☐	☒

Discussion: The project would not directly impact any public scenic resources, as designated in the County's General Plan (1994), or obstruct any public views of these visual resources.

2.	Substantially damage scenic resources, within a designated scenic corridor or public view shed area including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒

Discussion: The project site is not located along a County designated scenic road, public viewshed area, scenic corridor, within a designated scenic resource area, or within a state scenic highway. Therefore, no impact is anticipated.

3.	Substantially degrade the existing visual character or quality of the site and its surroundings, including	☐	☐	☒	☐

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
substantial change in topography or ground surface relief features, and/or development on a ridgeline?				

Discussion: The existing visual setting is largely rural, with low-density residential development occupying surrounding properties. The proposed creation of one additional parcel and future single-family dwelling is designed to maintain all development within a relatively clustered area at the lower half of the existing parcel. The project area is partially shielded from Larkin Valley Road by existing riparian vegetation that exists along the frontage of the property. Requirements for additional landscaping that provide vegetative screening are included in project conditions of approval

4. Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☒	☐	☐

Discussion: The project would contribute an incremental amount of night lighting to the visual environment. However, the following project conditions will reduce this potential impact to a less than significant level: all exterior lighting directed away from adjacent properties; light sources shielded by landscaping, fixture design or other physical means; and all exterior lighting utilizing high-pressure sodium vapor, metal halide, fluorescent, or equivalent energy-efficient fixtures.,

G. CULTURAL RESOURCES

Would the project:

1. Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5?	☐	☐	☐	☒

Discussion: The existing structure(s) on the property is/are not designated as a historic resource on any federal, state or local inventory.

2. Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5?	☐	☐	☒	☐

Discussion: According to the Santa Cruz County Archeological Society site assessment, dated July 3, 2004 (Attachment 15), there is no evidence of pre-historic cultural resources. However, pursuant to Section 16.40.040 of the Santa Cruz County Code, if archeological resources are uncovered during construction, the responsible persons shall immediately cease and desist from all further site excavation and comply with the notification procedures given in County Code Chapter 16.40.040.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
3. Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐

Discussion: Pursuant to Section 16.40.040 of the Santa Cruz County Code, if at any time during site preparation, excavation, or other ground disturbance associated with this project, human remains are discovered, the responsible persons shall immediately cease and desist from all further site excavation and notify the sheriff-coroner and the Planning Director. If the coroner determines that the remains are not of recent origin, a full archeological report shall be prepared and representatives of the local Native California Indian group shall be contacted. Disturbance shall not resume until the significance of the archeological resource is determined and appropriate mitigations to preserve the resource on the site are established.

4. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒

Discussion: No unique paleontological resources, sites, or geological features have been identified within the proposed disturbance area.

H. HAZARDS AND HAZARDOUS MATERIALS

Would the project:

1. Create a significant hazard to the public or the environment as a result of the routine transport, use or disposal of hazardous materials?	☐	☐	☐	☒

Discussion: No hazardous materials would be transported, used, or disposed as a part of the land division or resulting single-family dwelling construction and use; therefore there is no impact.

2. 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?	☐	☐	☐	☒

Discussion: Construction of the site improvements and future single-family residences would not involve the release of hazardous materials into the environment which would create a significant hazard to the public or environment; therefore there is no impact.

3. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or	☐	☐	☐	☒

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

proposed school?

Discussion: The site is not located within one quarter mile of an existing or proposed school and there are no hazardous emissions, hazardous materials, substances, or waste that would be associated with the proposed land division and improvements. Therefore there is no impact. See Section H-1 regarding recycling of paint and other construction materials.

4. 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, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒

Discussion: The project site is not included on the June 13, 2012 list of hazardous sites in Santa Cruz County compiled pursuant to the specified code.

5. 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, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒

Discussion: The parcel is not located within an airport land use plan or within two miles of a public or public use airport; therefore there is no impact

6. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒

Discussion: The parcel is not located within the vicinity of a private airstrip; therefore there is no impact.

7. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐

Discussion: The proposed project does not conflict with the County's adopted Emergency Management Plan (April 2002). Specific countrywide evacuation routes are not designated in the Emergency Management Plan; rather, feasible routes are determined based on particular events.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
8. Expose people to electro-magnetic fields associated with electrical transmission lines?	☐	☐	☒	☐

Discussion: Electric lines associated with the proposed land division would not be high voltage transmission; therefore, people would not be exposed to electromagnetic fields.

9. 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: The southwestern portion of the property is mapped as a fire hazard area, however there is no proposed development within the mapped portion of the property and the project design incorporates all applicable fire safety code requirements and includes fire protection devices as required by the local fire agency.

I. TRANSPORTATION/TRAFFIC

Would the project:

1. 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?	☐	☐	☒	☐

Discussion: The project would eventually allow for a small incremental increase in traffic on nearby roads and intersections. However, given the small number of new trips that would be created by the addition of one single-family dwelling, this increase is less than significant. Further, the increase would not cause the Level of Service at any nearby intersection to drop below Level of Service D.

2. 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?	☐	☐	☐	☒

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

Discussion: The proposed project does not impact air traffic patterns, therefore there is no impact.

3.	Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☒	☐

Discussion: The proposed development would result in an additional parcel and future single-family dwelling that would continue to take access from Larkin Valley Road, a County-maintained road. The addition of one single-family dwelling is not anticipated to impact any hazards or incompatible uses in the vicinity, in that such hazards are not currently known to exist.

4.	Result in inadequate emergency access?	☐	☐	☒	☐

Discussion: The project's road access meets County standards and has been approved by the local fire agency or California Department of Forestry, as appropriate.

5.	Cause an increase in parking demand which cannot be accommodated by existing parking facilities?	☐	☐	☒	☐

Discussion: The project meets the code requirements for the required number of parking spaces and therefore new parking demand would be accommodated on site.

6.	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: The proposed project would comply with current road requirements to prevent potential hazards to motorists, bicyclists, and/or pedestrians.

7.	Exceed, either individually (the project alone) or cumulatively (the project combined with other development), a level of service standard established by the County General Plan for designated intersections, roads or highways?	☐	☐	☒	☐

Discussion: See response I-1 above.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

J. NOISE

Would the project result in:

1. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project? ☐ ☐ ☒ ☐

Discussion: The project would create an incremental increase in the existing noise environment. However, this increase would be small, and would be similar in character to noise generated by the surrounding existing uses.

2. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels? ☐ ☐ ☒ ☐

Discussion: No excessive groundborne vibrations or noise levels will be created as a result of the proposed minor land division and future single family dwelling

3. Exposure of persons to or generation of noise levels in excess of standards established in the General Plan or noise ordinance, or applicable standards of other agencies? ☐ ☐ ☒ ☐

Discussion: Per County policy, average hourly noise levels shall not exceed the General Plan threshold of 50 L_{eq} during the day and 45 L_{eq} during the nighttime. Impulsive noise levels shall not exceed 65 db during the day or 60 db at night. The proposed minor land division and future residential use will not exceed these limitations in that the noises associated with a residential use are below the maximum thresholds for noise in the County General Plan and are consistent with surrounding rural residential land uses

4. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project? ☐ ☐ ☒ ☐

Discussion: Noise generated during construction would increase the ambient noise levels for adjoining areas. Construction would be temporary, however, and given the limited duration of this impact it is considered to be less than significant.

5. 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, would the project expose people residing or working in the project area ☐ ☐ ☐ ☒

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

to excessive noise levels?

Discussion: The project site is not located within an airport land use plan. The Watsonville Airport is located approximately 2.1 miles from the project site; therefore there is no impact.

6.	For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

Discussion: The project site is not located within the vicinity of a private airstrip; therefore there is no impact.

K. AIR QUALITY

Where available, the significance criteria established by the Monterey Bay Unified Air Pollution Control District (MBUAPCD) may be relied upon to make the following determinations. Would the project:

1.	Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐

Discussion: The North Central Coast Air Basin does not meet state standards for ozone and particulate matter (PM_{10}). Therefore, the regional pollutants of concern that would be emitted by the project are ozone precursors (Volatile Organic Compounds [VOCs] and nitrogen oxides [NO_x]), and dust.

Given the modest amount of new traffic that would be generated by the project there is no indication that new emissions of VOCs or NO_x would exceed MBUAPCD thresholds for these pollutants and therefore there would not be a significant contribution to an existing air quality violation.

Project construction may result in a short-term, localized decrease in air quality due to generation of dust. However, standard dust control best management practices, such as periodic watering, will be implemented during construction to reduce impacts to a less than significant level.

2.	Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐

Discussion: The project would not conflict with or obstruct implementation of the regional air quality plan. See K-1 above.

3.	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-	☐	☐	☒	☐

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?				

Discussion: See K-1 above.

4.	Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐

Discussion: No substantial pollutant concentrations would be emitted during or as a result of the proposed minor land division, with the exception of CO_2 emissions from construction vehicles and large events, which would be temporary and not substantial.

5.	Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒

Discussion: No objectionable odors would be created during construction or as a result of the proposed project therefore there is no impact.

L. GREENHOUSE GAS EMISSIONS

Would the project:

1.	Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐

Discussion: The proposed project, like all development, would be responsible for an incremental increase in green house gas emissions by usage of fossil fuels during the site grading and construction. At this time, Santa Cruz County is in the process of developing a Climate Action Plan (CAP) intended to establish specific emission reduction goals and necessary actions to reduce greenhouse gas levels to pre-1990 levels as required under AB 32 legislation. Until the CAP is completed, there are no specific standards or criteria to apply to this project. All project construction equipment would be required to comply with the Regional Air Quality Control Board emissions requirements for construction equipment. As a result, impacts associated with the temporary increase in green house gas emissions are expected to be less than significant.

2.	Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

Discussion: See the discussion under L-1 above. No impacts are anticipated.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
M. PUBLIC SERVICES				
Would the project:				
1. 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 public services:				
a. Fire protection?	☐	☐	☒	☐
b. Police protection?	☐	☐	☒	☐
c. Schools?	☐	☐	☒	☐
d. Parks or other recreational activities?	☐	☐	☒	☐
e. Other public facilities; including the maintenance of roads?	☐	☐	☒	☐

***Discussion (a through e)*:** While the project represents an incremental contribution to the need for services, the increase would be minimal. Moreover, the project meets all of the standards and requirements identified by the local fire agency or California Department of Forestry, as applicable, and school, park, and transportation fees to be paid by the applicant would be used to offset the incremental increase in demand for school and recreational facilities and public roads.

N. RECREATION				
Would the project:				
1. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☒	☐

***Discussion*:** The proposed project would result in the development of a new single-

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

family dwelling, which would potentially increase the use of an existing neighborhood or regional park or other recreational facilities; however, given the minimal increase in population associated with one single-family dwelling, the additional impact would not substantially add to or accelerate the physical deterioration of the facility. Additionally, capital improvement fees will be assessed for the construction of the new dwelling, which will further reduce the potential for accelerated physical deterioration of community parks and recreational facilities.

2.	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: No recreational facilities would be constructed or expanded as a part of the project.

O. UTILITIES AND SERVICE SYSTEMS

Would the project:

1.	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?	☐	☐	☒	☐

Discussion: Site analysis of the project by Roper Engineering, dated April 13, 2011 concluded that the proposed project will require the replacement of an existing 25 foot long section of a 15" culvert with two 24" culverts in order to alleviate existing drainage and flooding problems at the site. The replacement of this culvert will alleviate historical flooding along Larkin Valley Road without creating any additional significant environmental impacts.

2.	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?	☐	☐	☒	☐

Discussion: The project would rely on an individual well for water supply. Public water delivery facilities would not have to be expanded.

The project would be served by an on-site sewage disposal system, which would be adequate to accommodate the relatively light demands of the project.

3.	Exceed wastewater treatment requirements of the applicable	☐	☐	☒	☐

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
Regional Water Quality Control Board?				

Discussion: The project's wastewater flows would not violate any wastewater treatment standards.

4.	Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☒	☐

Discussion: The County Environmental Health Services Department has determined that the proposed wells will be sufficient to serve the proposed project and that no new entitlements or expanded entitlements are needed. Each resulting parcel would be served by an individual well.

5.	Result in 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?	☐	☐	☒	☐

Discussion: Refer to Sections O-2 and O-4.

6.	Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐

Discussion: The project would make a one-time contribution to the reduced capacity of regional landfills during construction. However no demolition is required to accommodate the proposed land division and future single-family dwelling. The impacts of temporary construction debris associated with a single-family dwelling will be less than significant.

7.	Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☒	☐

Discussion: Solid waste accumulation is anticipated to increase slightly as a result of the new residential uses; however, the increase would be minimal and is not anticipated to result in a breach of federal, state, or local statutes and regulations

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

P. LAND USE AND PLANNING

Would the project:

1.	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?	☐	☐	☐	☒

Discussion: The proposed project does not conflict with any regulations or policies adopted for the purpose of avoiding or mitigating an environmental effect.

2.	Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

Discussion: There are no habitat conservation plans or natural community conservation plans applicable to the subject property

3.	Physically divide an established community?	☐	☐	☒	☐

Discussion: The project would not include any element that would physically divide an established community.

Q. POPULATION AND HOUSING

Would the project:

1.	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)?	☐	☐	☒	☐

Discussion: The proposed project would not induce substantial population growth in an area because the project does not propose any physical or regulatory change that would remove a restriction to or encourage population growth in an area including, but limited to the following: new or extended infrastructure or public facilities; new commercial or industrial facilities; large-scale residential development; accelerated conversion of homes to commercial or multi-family use; or regulatory changes including General Plan amendments, specific plan amendments, zone reclassifications, sewer or water annexations; or LAFCO annexation actions.

The proposed project is designed at the density and intensity of development allowed by the General Plan and zoning designations for the parcel. Additionally, the project

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

does not involve extensions of utilities (e.g., water, sewer, or new road systems) into areas previously not served. Consequently, it is not expected to have a significant growth-inducing effect.

The proposed project would not extend the road or increase its capacity.

2.	Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Discussion: The proposed project would not displace any existing housing as an additional single-family dwelling will be constructed as a result of this proposal.

3.	Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Discussion: The proposed project would not displace a substantial number of people since the site is currently developed with a single-family dwelling that will remain.

R. MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
1. 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 animal community, reduce the number or restrict the range of a rare or endangered plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐

Discussion: 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 animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory were considered in the response to each question in Section III of this Initial Study. Resources that have been evaluated as significant would be potentially impacts by the project, specifically, San Andreas Oak Woodland, Monterey spineflower, and Santa Cruz long-toed salamander. However, mitigation has been included that clearly reduced these effects to a level below significance. As a result of this evaluation , there is no substantial evidence that, after mitigation, significant effects associated with this project would result. Therefore, this project has been determined not to meet this Mandatory Finding of Significance.

	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
2. 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)?	☐	☐	☐	☒

Discussion: In addition to project specific impacts, this evaluation considered the project's potential for incremental effects that are cumulatively considerable. As a result of this evaluation, it has been determined that there is no substantial evidence that there are cumulative effects associated with this project. Therefore, this project has been determined not to meet this Mandatory Finding of Significance.

	Potentially Significant Impact	Less than Significant with Mitigation	Less than Significant Impact	No Impact
3. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

Discussion: : In the evaluation of environmental impacts in this Initial Study, the potential for adverse direct or indirect impacts to human beings were considered in the response to specific questions in Section III. As a result of this evaluation, there were determined to be no potentially significant effects to human beings associated with this project. Therefore, this project has been determined not to meet this Mandatory Finding of Significance.

IV. TECHNICAL REVIEW CHECKLIST

	REQUIRED	DATE COMPLETED
Agricultural Policy Advisory Commission (APAC) Review	Yes ☒ No ☐	2/28/10
Archaeological Review	Yes ☒ No ☐	7/03/04
Biotic Report/Assessment	Yes ☒ No ☐	8/05/04 & 2/28/10
Geologic Hazards Assessment (GHA)	Yes ☐ No ☒	
Geologic Report	Yes ☒ No ☐	5/19/05, 8/21/06. and 02/21/07
Geotechnical (Soils) Report	Yes ☒ No ☐	8/21/06 and 3/23/07
Riparian Pre-Site	Yes ☐ No ☒	
Septic Lot Check	Yes ☒ No ☐	8/08/04
Other:(Habitat Management Plan)	Yes ☒ No ☐	6/28/11
Other:(Agricultural Viability Study)	Yes ☒ No ☐	2/28/10

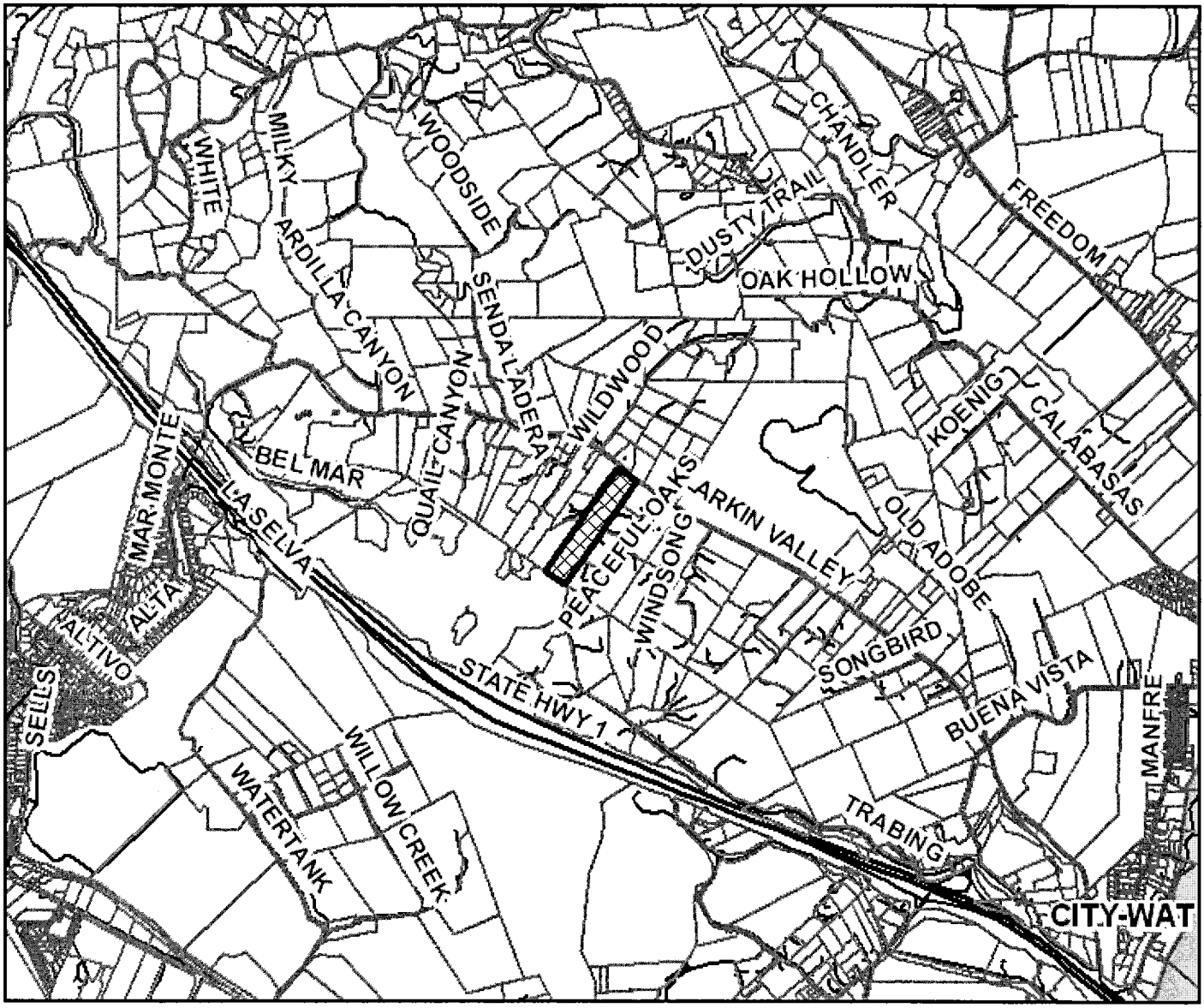
V. REFERENCES USED IN THE COMPLETION OF THIS ENVIRONMENTAL REVIEW INITIAL STUDY

County of Santa Cruz 1994.
1994 General Plan and Local Coastal Program for the County of Santa Cruz, California. Adopted by the Board of Supervisors on May 24, 1994, and certified by the California Coastal Commission on December 15, 1994.

VI. ATTACHMENTS

1. *Vicinity Map, Map of Zoning Districts; Map of General Plan Designations; and Assessor's Parcel Map.*
2. *Tentative Map & Preliminary Improvement Plans*, prepared by Roper Engineering, dated 4/18/11; revised 7/20/11 and 10/17/11
3. *Geologic Investigation and Updates(Report Summary, Conclusions, Recommendations,* prepared by Upp Geotechnology, Inc. dated 5/19/05, updated 8/21/06 and 02/21/07
4. *Geotechnical Investigation and Update (Conclusions and Recommendations)*, prepared by Dees & Associates, dated 08/21/06, updated 3/23/07
5. *Geologic and Geotechnical Report Review Letter*, prepared by Joe Hanna, County geologist, dated 4/13/07
6. *Hydrogeologic Report and Response to County Comments*, prepared by Upp Geotechnology, Inc. dated 10/05/09.
7. *Hydrogeologic Report Review Letter*, prepared by Joe Hanna, County geologist, dated 01/21/10
8. *Septic Lot Check*, prepared by Environmental Health Services, dated 6/8/04
9. *Discretionary Application Comments*, dated 09/18/12
10. *Drainage Calculations*, prepared by Roper Engineering, dated 4/13/11
11. *Biotic Report*, prepared by John Gilchrist & Associates, dated 2/23/10, revised 6/28/10
12. *Biotic Report Review,* prepared by EcoSystems West, dated 9/1/10
13. *Biotic Report Review Letter*, prepared by Matt Johnston, dated 9/2/10
14. *Habitat Management Plan,* prepared by John Gilchrist & Associates, dated 6/28/11
15. *Santa Cruz Long-Toed Salamander Assessment,* prepared by Bryan M. Mori, dated 8/5/04
16. *Archaeological Survey (Cover Sheet) and County Review Letter,* prepared by Rob Edwards, Cabrillo College, dated 7/3/04
17. *Agricultural Viability Study* reviewed by Richard Nutter, dated 2/28/10

Location Map



3,700 1,850 0 3,700 7,400 11,100 14,800

Feet

LEGEND

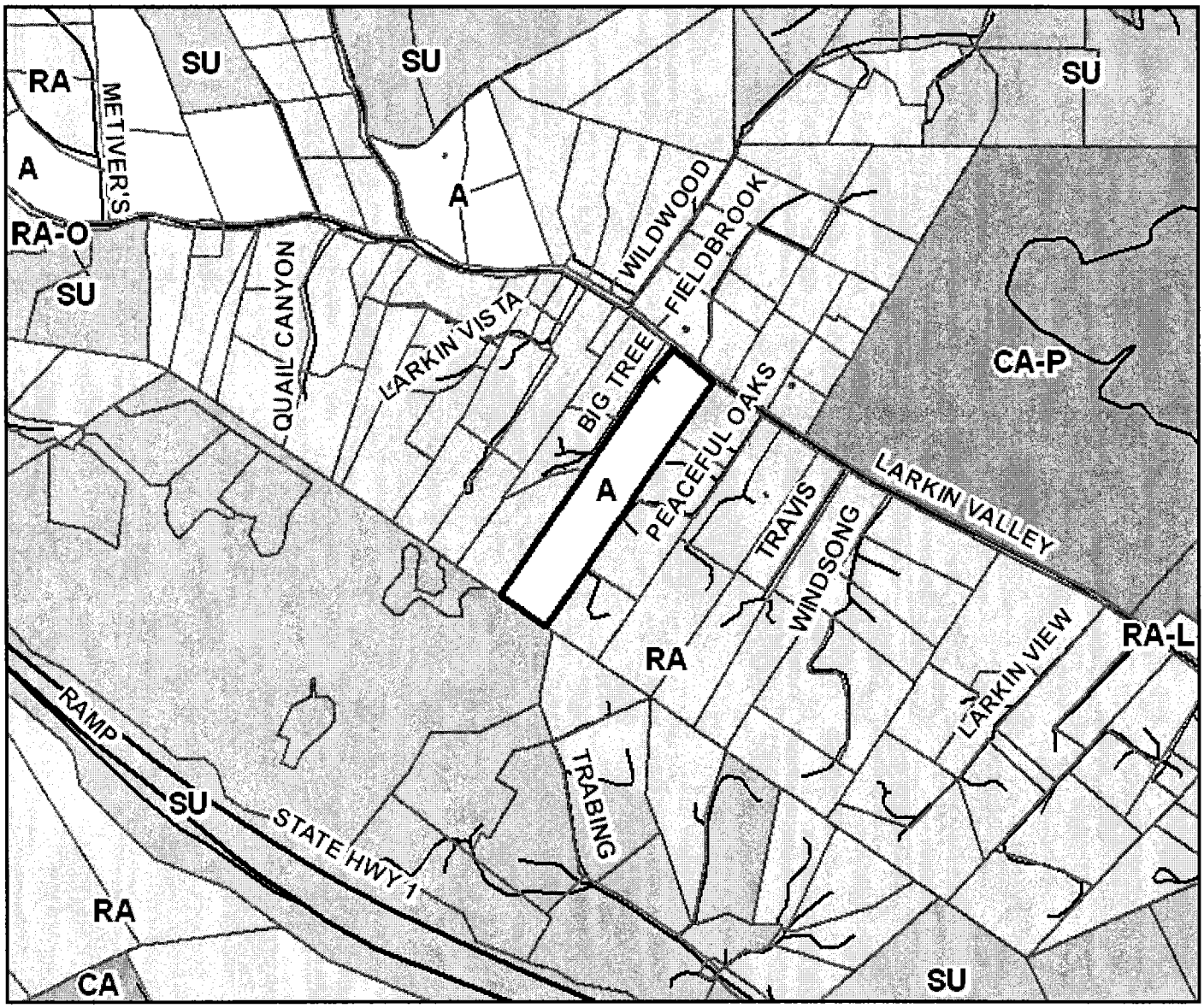
- APN: 049-121-23
- Assessors Parcels
- Streets
- State Highways
- WATSONVILLE

N
W E
S

Map Created by
County of Santa Cruz
Planning Department
February 2010

ATTACHMENT 1

Zoning Map



1,500 750 0 1,500 3,000 4,500 6,000 Feet

LEGEND

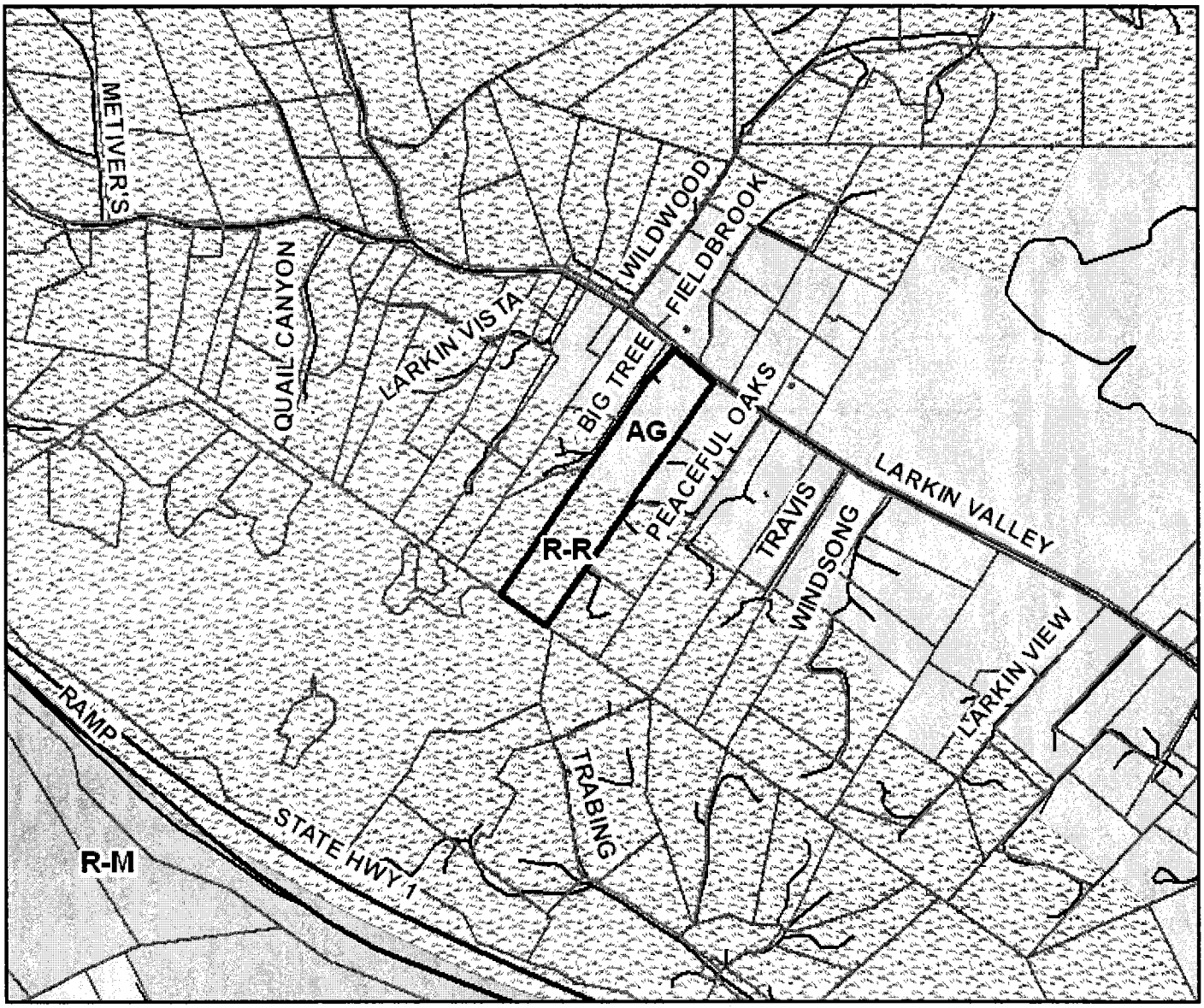
- APN: 049-121-23
- Assessors Parcels
- Streets
- State Highways
- AGRICULTURE
- AGRICULTURE COMMERCIAL
- AGRICULTURE RESIDENTIAL
- SPECIAL USE

N W E S

Map Created by
County of Santa Cruz
Planning Department
February 2010

ATTACHMENT 1

General Plan Designation Map



1,500 750 0 1,500 3,000 4,500 6,000 Feet

LEGEND

- APN: 049-121-23
- Assessors Parcels
- Streets
- State Highways
- Agriculture
- Residential-Rural
- Residential-Mountain

N
W E
S

Map Created by
County of Santa Cruz
Planning Department
February 2010

ATTACHMENT 1

ATTACHMENT 1

FOR TAX PURPOSES ONLY

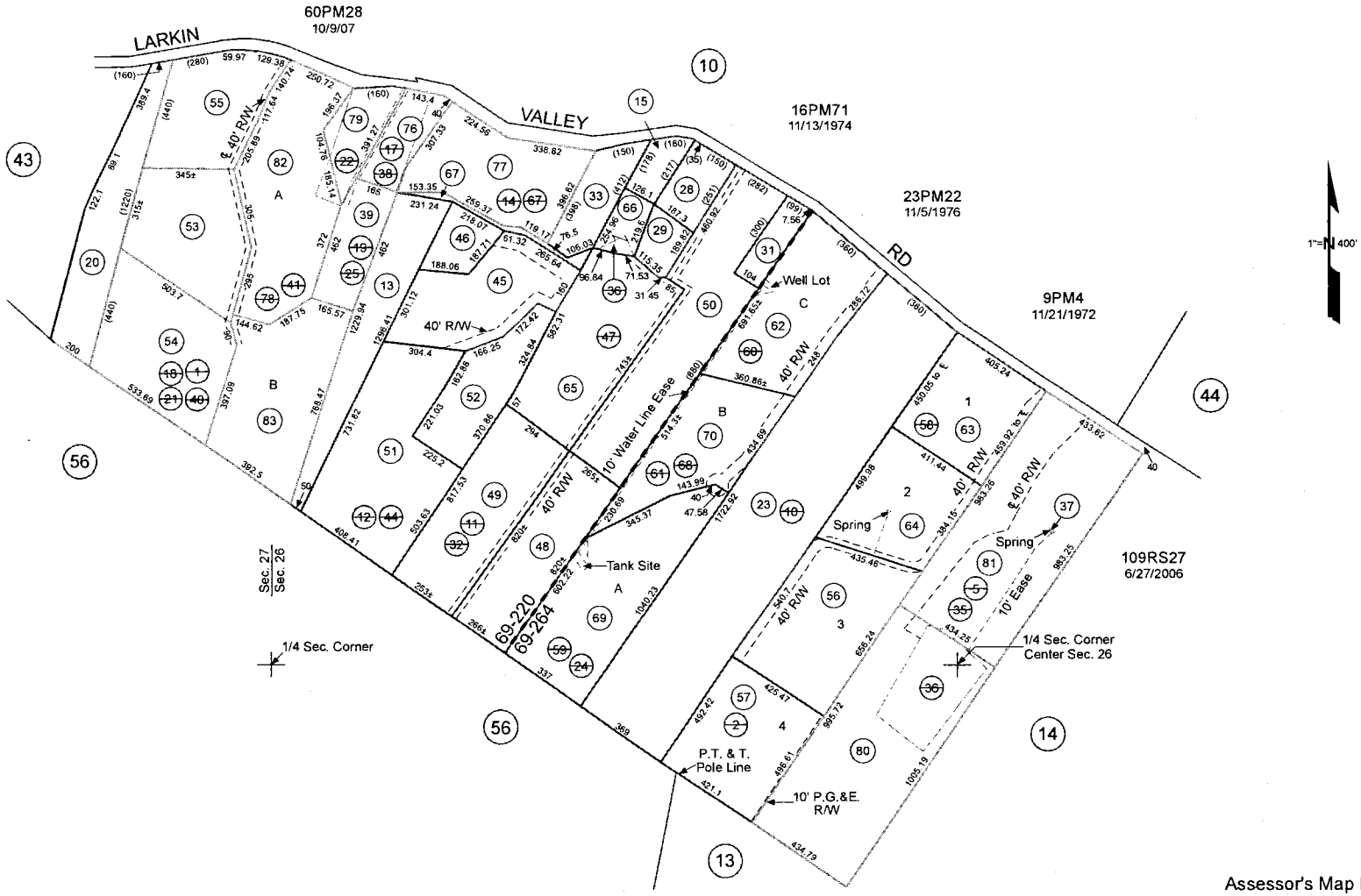
THE ASSESSOR MAKES NO GUARANTEE AS TO MAP ACCURACY NOR ASSUMES ANY LIABILITY FOR OTHER USES. NOT TO BE REPRODUCED. ALL RIGHTS RESERVED.

SAN ANDREAS RANCHO

W. 1/2 SEC. 26 & E. 1/2 SEC. 27, T.11S., R.1E., M.D.B. & M.

Tax Area Code
69-220 69-264

49-12

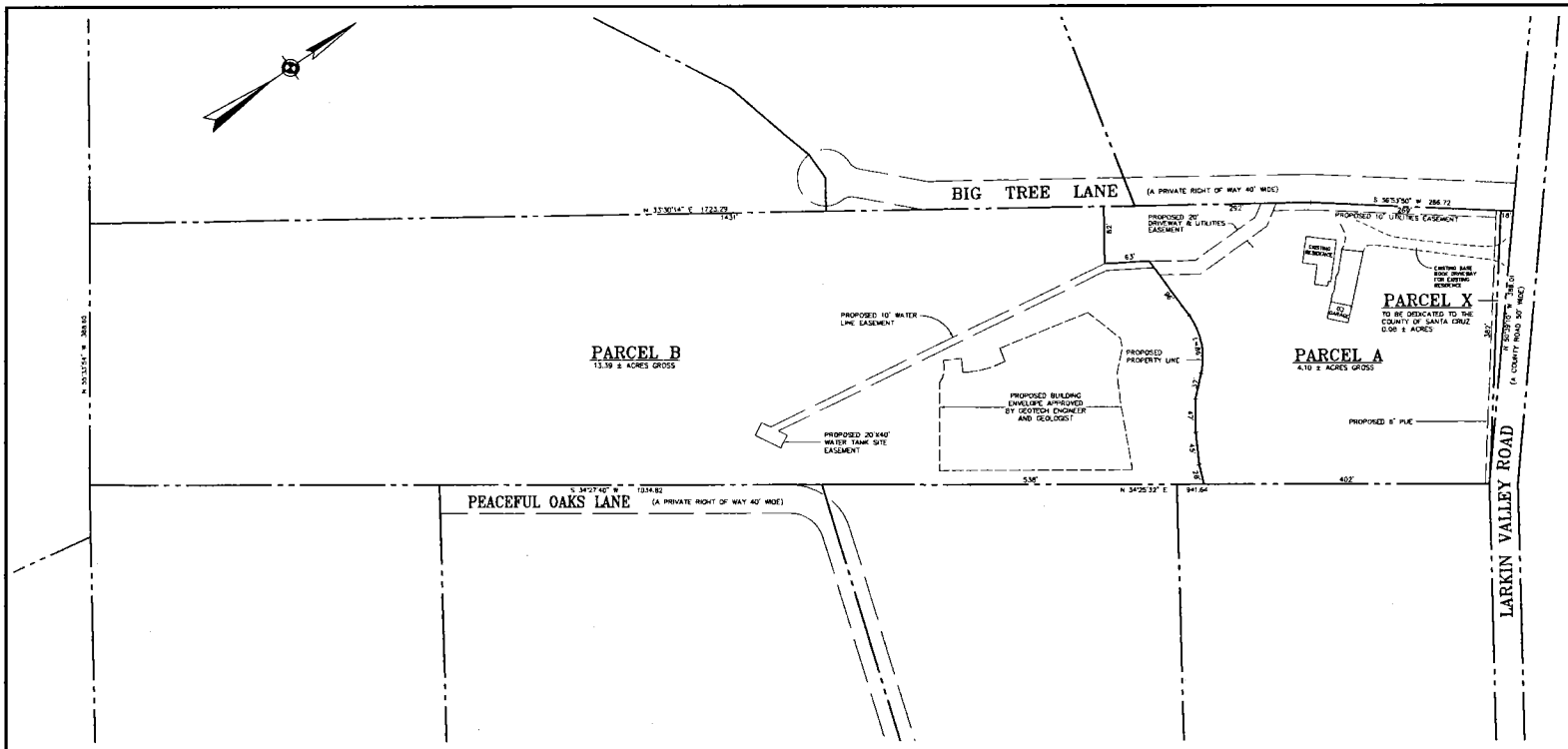


Note - Assessor's Parcel & Block Numbers Shown in Circles.

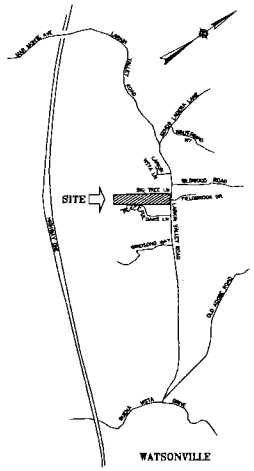
Assessor's Map No. 49-12
County of Santa Cruz, Calif.
April 2000

Electronically redrawn 4/21/00 KSA
Rev. 4/21/00 KSA (Pcl. to Pg. 56)
Rev. 1/4/02 mvm (TCA)
Rev. 12/2/03 CB (Added St. names)
Rev. 10/12/04 mvm (4-0044608, 9 & 10, LBA 1-76 & 77)
Rev. 6/20/06 mvm (6-0005352, LBA 1-80 & 81)
Rev. 7/2/07 td (109RS27)
Rev 11/1/07 CB (60PM28, Sp 1-82 & 83)
Rev 4/23/08 CB (TCA)

ATTACHMENT 6



TENTATIVE MAP
SCALE: 1"=80'
0 40 80 160
FEET



VICINITY MAP
SCALE: 1"=2000'±

CONSULTANTS

LAND USE CONSULTANT:
STEPHEN GRAVES AND ASSOCIATES
2735 PORTER STREET
SOQUEL, CA 95073
(831) 465-0677
sgassociates@cruzio.com

CIVIL ENGINEER/LAND SURVEYOR:
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64 PENNY LANE, SUITE A
WATSONVILLE, CA. 95076
(831) 724-5300
jeff@roperengineering.com

GEOLOGIST:
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CAMPBELL, CA 95008
(408) 869-5436

GEOTECHNICAL ENGINEER:
DEES AND ASSOCIATES
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ENVIRONMENTAL CONCEPTS
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APTOS, CA 95001
(831) 684-1565

BIOTIC:
JOHN GILCHRIST & ASSOCIATES
JOHN GILCHRIST
226 SPRING STREET
SANTA CRUZ, CA 95060
(831) 429-4355

GENERAL NOTES

1. OWNER/SUBDIVIDER: NATHAN LEWIS
711 LARKIN VALLEY ROAD
WATSONVILLE, CA 95076
(831) 728-0292
2. WATER SOURCE: PRIVATE WELL
3. SEWAGE DISPOSAL: PRIVATE SEPTIC
4. PRESENT ZONING: A, AGRICULTURAL
5. PRESENT LAND USE: RESIDENTIAL & AGRICULTURAL
6. STREET TREES: NONE
7. COMMON AREA: NONE
8. AREAS SUBJECT TO INUNDATION: 100 YR FEMA FLOOD ZONE AS SHOWN AND FLOWLINES OF DRAINAGE TRIBUTARIES
9. ALL UTILITIES SHALL BE UNDERGROUND.

SHEET INDEX

SANTA CRUZ COUNTY APPLICATION NO. 10-0030

PRELIMINARY

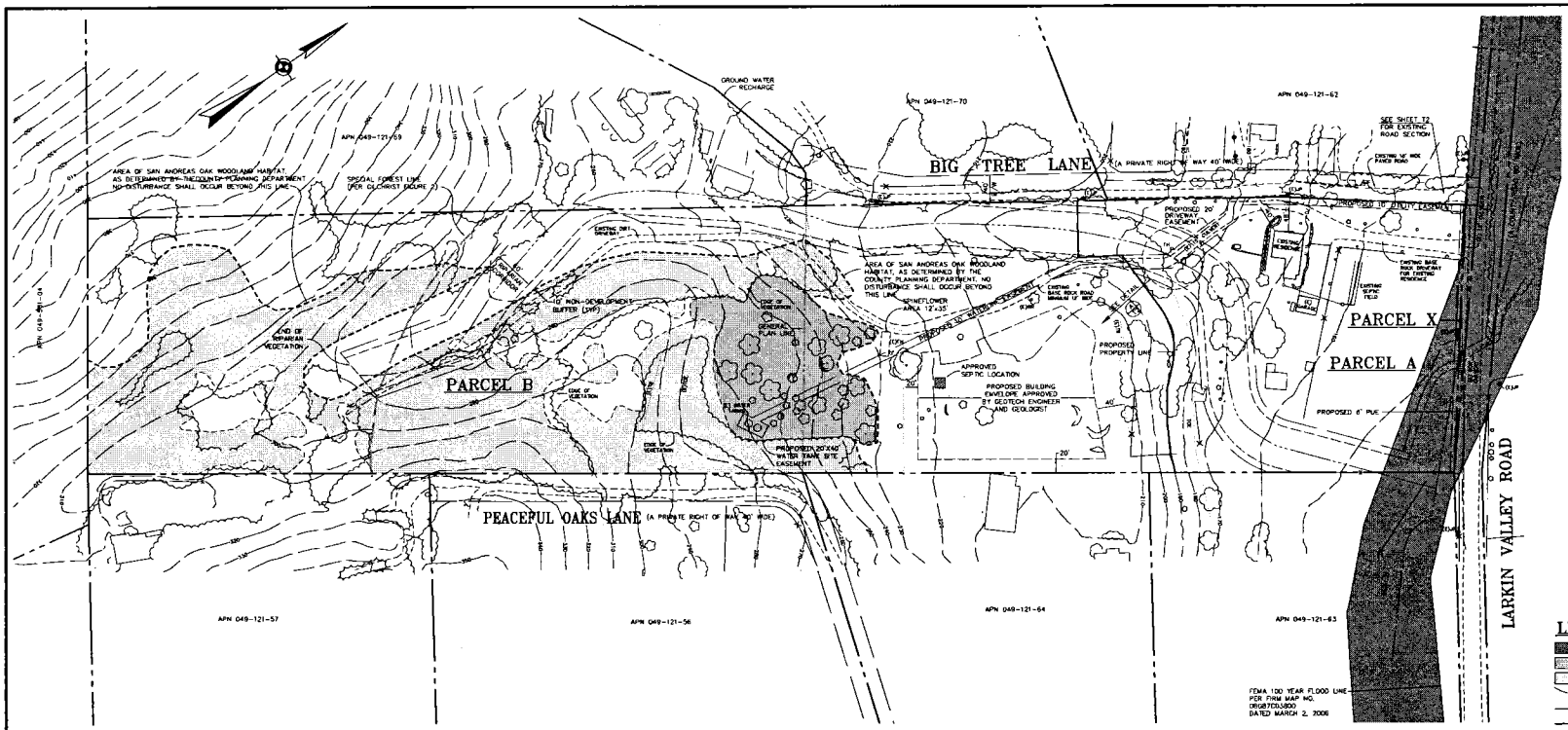
ROPER ENGINEERING
CIVIL ENGINEERING & LAND SURVEYING
64 PENNY LANE, SUITE A WATSONVILLE, CA 95076
(831) 724-5300 PHONE (831) 724-5509 FAX jeff@roperengineering.com

MINOR LAND DIVISION FOR
NATHAN LEWIS
711 LARKIN VALLEY ROAD WATSONVILLE APN 049-121-23

TENTATIVE MAP

SCALE:	AS NOTED
DESIGNED BY:	JR
DRAWN BY:	JR
DATE:	APR. 18, 2011
REVISED:	JULY 20, 2011
JOB NO.:	08020
SHEET	T1
OF	4 SHEETS

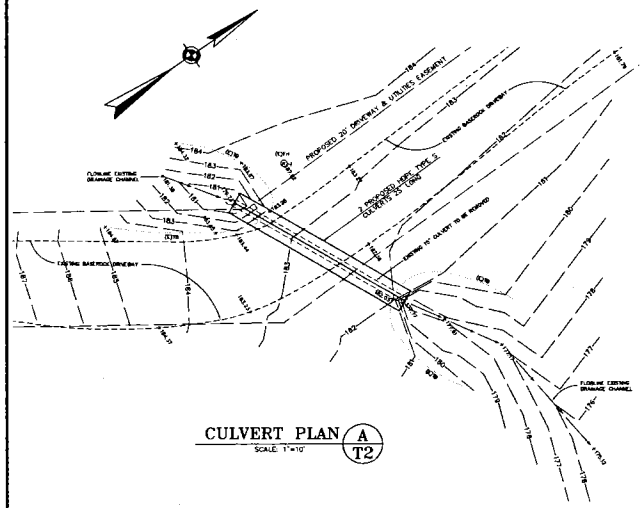
ATTACHMENT 2



RESOURCES & CONSTRAINTS MAP

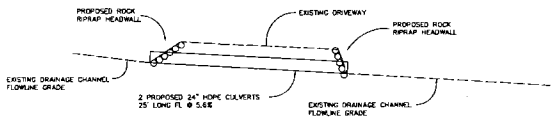
SCALE: 1"=80'

0 40 80 150 FEET



CULVERT PLAN (A / T2)

SCALE: 1"=10'



CULVERT PROFILE (B / T2)

SCALE: 1"=10'

LEGEND

- 100 YEAR FLOOD ZONE
- SAN ANDREAS OAK WOODLAND: TRANSITIONAL
- SAN ANDREAS OAK WOODLAND
- 210 EXISTING CONTOUR
- EXISTING FENCE
- PROPERTY LINE
- FLOWLINE SWALE
- (E) EXISTING
- EP EDGE OF PAVEMENT
- FH FIRE HYDRANT
- JP JOINT POWER POLE
- PUE PUBLIC UTILITIES EASEMENT
- TB TOP OF BANK
- TOE TOE OF SLOPE

CONTOUR INTERVAL IS TEN FEET
DATUM IS ASSUMED
(SEE SHEET T2 FOR TWO FOOT CONTOUR INTERVAL)

UNITS ARE IN FEET AND DECIMALS

UTILITY NOTES

DRAINAGE

FOR FUTURE DEVELOPMENT ON THE PROPOSED BUILDING SITE, POST DEVELOPMENT RUNOFF WILL NOT BE GREATER THAN PRE-DEVELOPMENT RUNOFF. PER INES & ASSOCIATES LETTER, "ON-SITE RETENTION OF COLLECTED RUNOFF" DATED SEPTEMBER 12, 2005, IT IS FEASIBLE FOR FUTURE CONSTRUCTION ON THE PROPOSED BUILDING ENVELOPE TO RETAIN ADDITIONAL RUNOFF ON-SITE. ON-SITE RETENTION CAN BE ACCOMPLISHED THROUGH A COMBINATION OF INCREASING "TIME OF CONCENTRATION", PERCOLATION AND ON-SITE STORAGE. THE "TIME OF CONCENTRATION" CAN BE INCREASED THROUGH THE USE OF SWALES AND PERVIOUS PAVEMENTS. THE SOILS BELOW THE HOMESITE ARE SANDY AND SUITABLE FOR PERCOLATING SURFACE RUNOFF BACK INTO THE GROUND. WATER THAT DOES NOT PERCOLATE INTO THE GROUND FAST ENOUGH CAN BE STORED WITH STORAGE STRUCTURES, GRAVEL FILLED BASINS AND BIO SWALES. DRAINAGE DESIGN AND MITIGATION MEASURES FOR THE PROPOSED BUILDING ENVELOPE SHALL BE DEVELOPED DURING THE BUILDING PERMIT STAGE.

WATER

ALL WATER LINE RELATED EASEMENTS WILL BE ADDRESSED DURING THE PREPARATION OF THE FINAL MAP.

NET DEVELOPABLE CALCULATIONS

	GROSS	RIPARIAN CORRIDOR	RIGHTS OF WAY	COUNTY R/W DEDICATION	100 YR FEMA FLOOD ZONE	50% SLOPE	NET
PARCEL A	4.18 ACRES	1.02 ACRES	0.10 ACRES	0.08 ACRES	0.45 ACRES	0.01 ACRES	2.81 ACRES
PARCEL B	13.39 ACRES	1.21 ACRES	0.00 ACRES	0.00 ACRES	0.00 ACRES	0.09 ACRES	12.09 ACRES
TOTAL	17.57 ACRES	2.23 ACRES	0.10 ACRES	0.08 ACRES	0.45 ACRES	0.10 ACRES	14.90 ACRES

SANTA CRUZ COUNTY APPLICATION NO. 10-0030

PRELIMINARY

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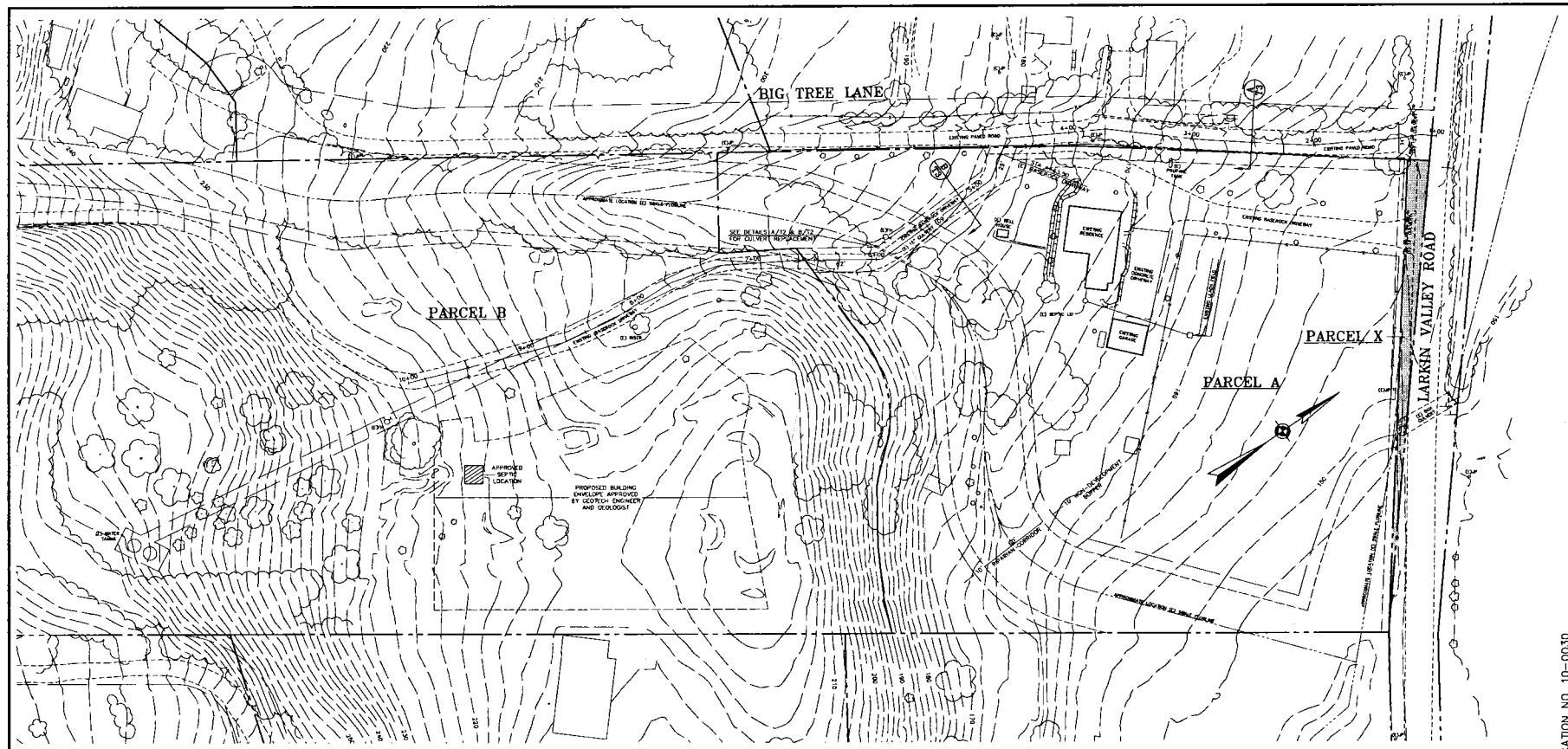
MINOR LAND DIVISION FOR
NATHAN LEWIS
711 LARKIN VALLEY ROAD WATSONVILLE APN 049-121-23

RESOURCES & CONSTRAINTS MAP

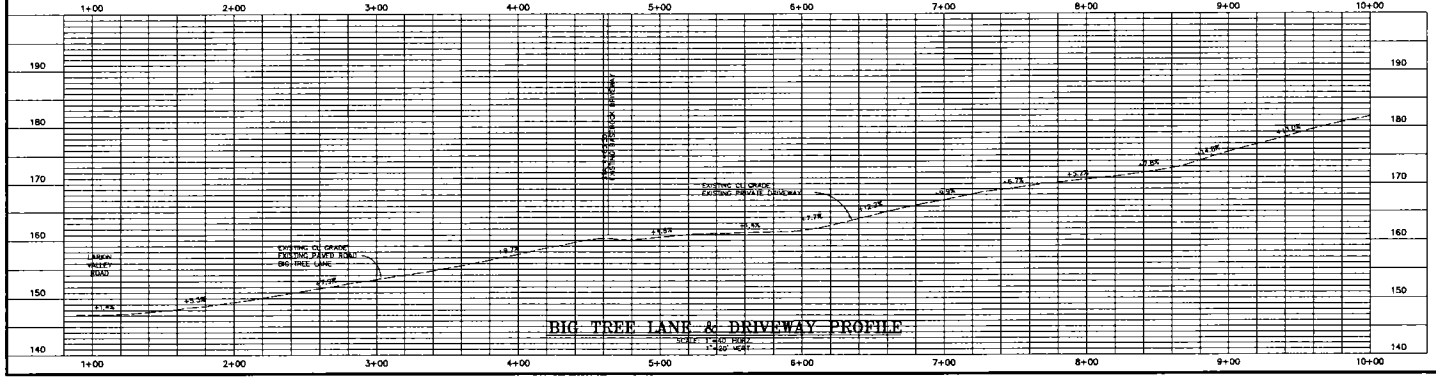
SCALE:	AS NOTED
DESIGNED BY:	JR
DRAWN BY:	JR
DATE:	APR. 18, 2011
REVISED:	OCT. 17, 2011
JOB NO.:	08020
SHEET	T2
OF	4 SHEETS

ATTACHMENT 2



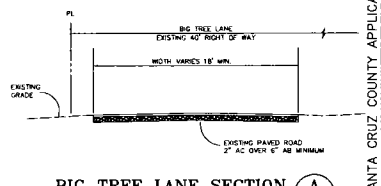
BIG TREE LANE & DRIVEWAY PLAN

SCALE: 1"=40'



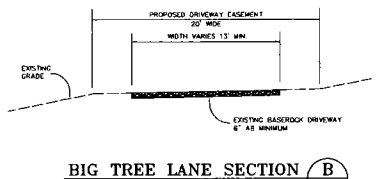
BIG TREE LANE & DRIVEWAY PROFILE

SCALE: 1"=40' HORZ.
1"=20' VERT.



BIG TREE LANE SECTION (A/T3)

SCALE: 1"=5'



BIG TREE LANE SECTION (B/T3)

SCALE: 1"=5'

SANTA CRUZ COUNTY APPLICATION NO. 10-0030

ROPER ENGINEERING
CIVIL ENGINEERING & LAND SURVEYING
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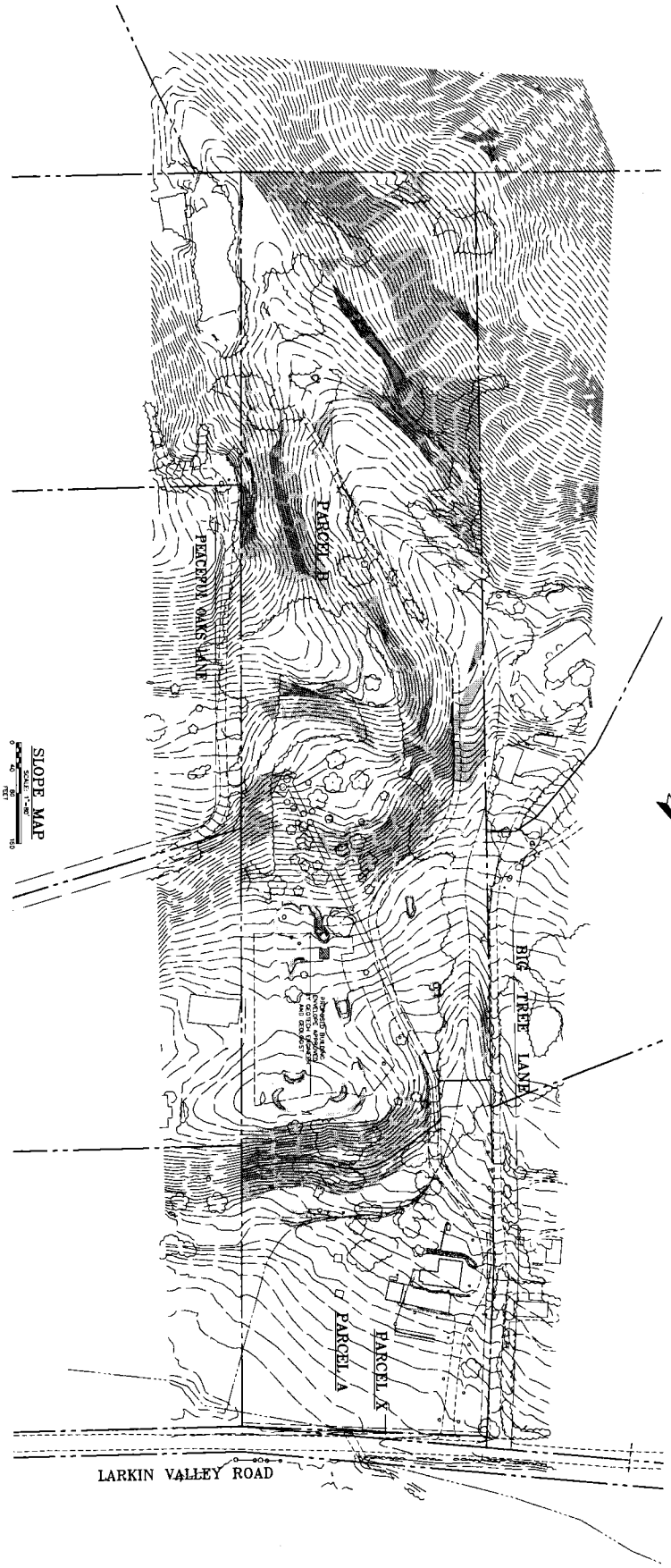
MINOR LAND DIVISION FOR
NATHAN LEWIS
711 LARKIN VALLEY ROAD WATSONVILLE APN 049-121-23

BIG TREE LANE & DRIVEWAY PLAN & PROFILE

SCALE:	AS NOTED
DESIGNED BY:	JR
DRAWN BY:	JR
DATE:	APR. 18, 2011
REVISED:	JULY 20, 2011
JOB NO.:	08020
SHEET	T3
OF	4 SHEETS



NOTES

CONTOUR INTERVAL 5 FEET AND 10 FEET BASED ON AERIAL PHOTOGRAPHY FLOWN BY PACIFIC AERIAL PHOTOGRAPHIC SERVICES, DATED AUGUST 5, 2004. DATUM ASSUMED.

SLOPE TABLE

	0% - 15%	15% - 30%	30% - 50%	OVER 50%	TOTAL
OVERALL (GROSS)	8.1 AC	5.4 AC	3.5 AC		17.0 AC

SANTA CRUZ COUNTY APPLICATION NO. 10-0030

MINOR LAND DIVISION FOR
NATHAN LEWIS
711 LARKIN VALLEY ROAD WATSONVILLE APN 049-121-23

SLOPE MAP

ROPER ENGINEERING
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64 PENNY LANE, SUITE A WATSONVILLE, CA 95076
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SCALE: AS NOTED
DRAWN BY: JR
DATE: APR. 18, 2011
REVISED: JULY 20, 2011
JOB NO.: 08020
SHEET: T4

ATTACHMENT 2

UPP GEOTECHNOLOGY, INC.
Engineering Geology • Geotechnical Engineering

May 19, 2005
Project No. 2798.2R1
Serial No. 13299

Mr. Nathan Lewis
c/o STEPHEN GRAVES AND ASSOCIATES
2735 Porter Street
Soquel, CA 95073

SUBJECT: GEOLOGIC INVESTIGATION
LANDS OF LEWIS
711 LARKIN VALLEY ROAD
SANTA CRUZ COUNTY, CALIFORNIA

Dear Mr. Lewis:

As you requested, we have performed a geologic investigation for the subdivision of your property located at 711 Larkin Valley Road in unincorporated Santa Cruz County, California. The accompanying report presents the results of our investigation and testing, and our conclusions and concerning the geologic aspects of the project.

This report includes information vital to the success of your project. We strongly urge you to thoroughly read and understand its contents. Kindly refer to the text of the report for detailed findings.

UPP GEOTECHNOLOGY, INC.

Christopher R. Hundemer
Senior Engineering Geologist
Certified Engineering Geologist 2314

CRH:jc

Copies: Addressees (5)
Ms. Becky Dees (1)

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INTRODUCTION

This report presents the results of our geologic investigation for the subdivision of the Lewis property located at 711 Larkin Valley Road in unincorporated Santa Cruz County, California (see Figure 1, Site Location Map). The purpose of our investigation was to evaluate the nature and extent of geologic hazards that could affect the development of the newly subdivided properties and access roadway. We understand that you are planning to subdivide the parcel into three residential properties and construct two new single-family residences on the new lots. Dees and Associates is currently conducting a geotechnical investigation for the proposed project.

We have previously completed a reconnaissance geologic investigation of the property, the results of which are presented in our letter dated September 24, 2004. Pertinent information obtained during that investigation has been reiterated here, in this complete report. Dees and Associates has also previously performed a geotechnical feasibility study for the project, the results of which were presented in their Geotechnical Feasibility Study letter dated June 4, 2004.

SCOPE OF SERVICES

Our scope of services for this investigation included a review of previous reports, geologic literature, and aerial photographs of the site vicinity; consultation with the County Geologist (Mr. Joe Hanna) about his concerns with the area; engineering geologic reconnaissances and mapping; preparation of a slope profile; subsurface exploration; field and laboratory testing; engineering geologic analyses of collected data; and the preparation of this report. This report has been prepared

as a product of our service for the exclusive use of Mr. Nathan Lewis for the proposed subdivision of the subject property. This report must not be used by other parties or for other purposes without prior written authorization from Upp Geotechnology, Inc. This investigation has been conducted in accordance with the scope and conditions presented in our proposal dated April 19, 2005. No other warranty, either expressed or implied, is made.

Because of possible future changes in site conditions or the standards of practice for engineering geology, the findings of this report may not be considered valid beyond three years from the report date, without review by Upp Geotechnology, Inc. In addition, in the event that any changes in the nature or location of the proposed improvements are planned, the conclusions of this report may not be considered valid unless such changes are reviewed, and the conclusions presented in this report are modified or verified in writing, by this firm.

METHOD OF INVESTIGATION

Geologic maps and aerial photographs were reviewed as part of our reconnaissance investigation to evaluate the prevailing geologic conditions on the site and in the vicinity. An initial site reconnaissance by our senior engineering geologist was performed on September 22, 2004 as part of our reconnaissance geologic investigation. Subsequently, additional site visits were performed by our principal engineering geologist, senior engineering geologist, and staff geologist to meet with the project design team, to determine exploration pit sites, and to conduct additional engineering geologic mapping.

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We investigated the subsurface conditions on May 6, 2005 by excavating four exploration pits to depths of between approximately 7 to 8 feet using a small track-mounted excavator equipped with a 24-inch bucket. On that same date, three test borings were excavated to a maximum depth of approximately 67 feet using a truck mounted drill rig. The locations of the pits and the borings are shown on Figure 4, Site Plan and Engineering Geologic Map. The locations were approximately determined by measuring distance and bearing from known points on the supplied site plan and should be considered accurate only to the degree implied by the mapping technique used.

The exploration pits were observed by our principal engineering geologist and were logged by our senior engineering geologist. The test borings were continuously logged by our staff geologist in general accordance with the Unified Soil Classification System described on Figure 6, Key to Logs. A Summary of Field Sampling Procedures is presented on Figure 7. The logs of the pits and borings are presented on Figures 8 through 11, Logs of Exploration Pits 1 through 4 and Figures 12 through 15, Logs of Borings 1 through 3. The logs show our interpretation of the subsurface conditions at the locations and on the date indicated and it is not warranted that they are representative of the subsurface conditions at other locations and times.

Soil samples obtained from the borings and pits were retained for laboratory classification and testing. The results of grain size distribution tests are presented on Figures 16-22, Sieve Test Results – Samples 1 through 7. In addition, Ms. Becky Dees also logged the test borings and retained soil samples for her testing and analyses.

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GEOLOGY AND SEISMICITY

Geology

The subject property is located at the base of a northeast-facing slope on the southwestern side of Larkin Valley (see Figure 1). According to the Geologic Map of Santa Cruz County (Brabb, 1989), the site is underlain by Holocene age (approximately 10,000 year old to present) colluvium overlying Pleistocene age (approximately 1.6 million to 10,000 year old) fluvial lithofacies and Aromas sand. The colluvium is generally described as unconsolidated, heterogeneous deposits of moderately sorted to poorly sorted silt, sand, and gravel. These materials are generally the result of slope wash and soil creep mechanisms, and are commonly thickest near the bases of slopes. The fluvial lithofacies are described as semi-consolidated, heterogeneous, moderately sorted to poorly sorted silt, clay, sand, and gravel that have been deposited by meandering and braided streams. The Aromas sand unit is described as a heterogeneous sequence of silt, sand, clay, and gravel that have been deposited by both eolian (wind) and fluvial (stream) mechanisms (see Figure 2, Regional Geologic Map).

Landslides

According to the Preliminary Map of Landslide Deposits in Santa Cruz County (Cooper-Clark and Associates, 1975), a queried landslide is mapped on the property northwest of the subject site. The map shows that the toe of the landslide encroaches onto the lowest portion of the subject property, in the area of the existing residence and garage (see Figure 3, Regional Landslide Map).

Groundwater Recharge

The lower portion of the property is shown on the Santa Cruz County GIS to be located within a Primary Groundwater Recharge. The limits of this zone are based on mapping done by the Soil Conservations Service and the U.S. Geological Survey. These zones indicate areas which by nature of surface soil, slope and subsurface geology are particularly important for allowing surface water to percolate to underground storage. Sites located within the zone are underlain by a geologic formation that is a recognized aquifer in the county, or are located in an area with a surface soil that has a permeability of greater than 2 inches per hour.

Seismicity

The greater San Francisco Bay Area is recognized by geologists and seismologists as one of the most active seismic regions in the United States. The four major faults that pass through the Bay Area in a northwest direction have produced approximately 12 earthquakes per century strong enough to cause structural damage. The faults causing such earthquakes are part of the San Andreas fault system, a major rift in the earth's crust that extends for at least 700 miles along the California Coast, which includes the San Andreas, Hayward, Calaveras, and San Gregorio fault zones.

The nearest trace of the active San Andreas fault is located approximately 6 miles northeast of the site; the San Gregorio fault is located approximately 14 miles southwest of the site; and the Hayward/Calaveras fault system is located approximately 19 miles northeast of the site. In addition,

according to the most recent regional geologic map, the nearest trace of the Zayante fault is mapped approximately 2¾ miles northeast of the site.

Based on analyses by the U.S. Geological Survey's Working Group on California Earthquake Probabilities (2003), the San Francisco Peninsula segment of the San Andreas fault is estimated to have a 21% probability of producing an earthquake with a magnitude of 6.7 or greater by the year 2032. The magnitude of an earthquake is a measure of the amount of energy released during a seismic event, as determined by seismographic measurements. The probability of at least one magnitude 6.7 or greater earthquake on one of the active faults in the San Francisco Bay area by the year 2032 is estimated to be 62%.

The intensity of an earthquake differs from the magnitude in that intensity is a measure of the effects of an earthquake rather than a measure of the energy released. These effects can vary considerably based on the earthquake magnitude, distance from the earthquakes epicenter, and site geology. Because of the site's proximity to the San Andreas and other faults and the site geology, maximum anticipated ground shaking intensities, given a large earthquake on the fault in the site vicinity, are characterized as very strong and approximately equal to a Modified Mercalli intensity of VIII (Borcherdt, et. al., 1975). A Modified Mercalli intensity of VIII typically could cause slight damage to specially designed earthquake-resistant structures, considerable damage in well built ordinary structures, and partial collapse in poorly built or designed structures (Yanev, 1974) (see Table I, Modified Mercalli Scale of Earthquake Intensities). Ground shaking equal to a Modified Mercalli

intensity of between VII and VIII was felt at the site because of the October 17, 1989 Loma Prieta Earthquake (Stover, et al., 1990).

SITE CONDITIONS

Site Description

The subject site is a rectangular-shaped parcel measuring approximately 2,000 feet long by 375 feet wide, located on the southwestern side of Larkin Valley Road. The site is bounded to the northeast by Larkin Valley Road and the northern half of the northwestern property is bounded by Big Tree Lane. All other sides of the property are bounded by private developed and undeveloped lands. Total topographic relief across the property is approximately 200 feet.

A graded driveway enters the northwestern corner of the property and leads from Larkin Valley Road along the northwestern property line to an existing single-story residence and garage constructed on the lower portion of the site. An incised drainage is located along the northern portion of the northwestern property line, on the southeast side of Big Tree Lane. This drainage enters the property behind the residence and trends east across the site in an armored swale behind the residence and garage.

Behind the swale, the ground surface slopes up with gentle to moderate slopes varying between approximately 4:1 and 3:1 (horizontal to vertical) to a relatively flat terrace that is the location of the first proposed building site. The building envelope measures approximately 300 feet by 160 to 180

feet, and is located approximately 550 to 850 feet southwest of Larkin Valley Road. The site has been cleared of trees and vegetation. A topographic saddle trending northwest-southeast crosses the building envelope. Total relief across the building envelope varies less than 20 feet. Drainage across the building site is characterized as sheet flow to the northeast and southwest into the saddle, then to the northwest down the graded driveway to the incised drainage below.

The second building site, measuring approximately 75 by 80 feet, is located higher on the property, on the northeast-facing slope below the existing water tanks. This pad is located approximately 840 to 920 feet southwest of Larkin Valley Road. This building site has moderate slopes with gradients of approximately 4:1. Vegetation in this area consists of scattered oak trees with associated grasses and undergrowth. Drainage on this site is characterized as sheet flow to the northwest and northeast.

Subsurface

Four exploration pits were excavated in the lower portion of the property to evaluate the presence of landsliding and/or groundwater recharge potential in this area. All four pits encountered a similar sequence of subsurface materials consisting of very dark grayish brown to black, fine- to medium-grained sandy clay topsoil overlying alluvial fan deposits. The alluvial fan deposits are comprised of 1½- to 3-foot thick, nearly horizontally layered, sandy clay to clayey sand. The materials are stiff to dense, moderately to highly plastic, and moist to saturated. Logs of the exploration pits are shown on Figures 8 through 11.

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Boring 1, excavated to a depth of approximately 67½ feet in the area of the upper building site, encountered dark yellowish brown, very homogeneous, medium dense, very well sorted, very fine- to medium-grained sand that persisted to the bottom of the boring (see Figures 12 and 13). In our opinion, this sand appears to be eolian deposits of the Aromas formation.

Boring 2, excavated within the lower building site, initially encountered similar sand that persisted to a depth of approximately 25¾ feet. Beneath the sand, this boring exposed dark gray, very stiff, homogeneous, plastic to highly plastic clay. The clay persisted to the bottom of the boring at a depth of approximately 41½ feet (see Figure 14). In our opinion, the clay encountered in the lower half of the boring appears to be fluvial deposits also of the Aromas formation.

Boring 3, excavated between Borings 1 and 2 northwest of the proposed building sites, encountered the same sequence of subsurface materials as was exposed in Boring 2, with the contact between the eolian sand and fluvial clay at a depth of approximately 23 feet. Boring 3 terminated at a depth of approximately 30 feet (see Figure 15).

Our interpretation of subsurface conditions is presented on Figure 5, Geologic Cross-Sections A-A'. It should be noted that no thick colluvium or landslide debris was encountered in any of our excavations.

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Groundwater

Free groundwater was encountered in all four pits at a depth of approximately 7 feet below the ground surface. Borings 1, 2, and 3 all encountered free groundwater at depths of approximately 21½, 23½, and 19 feet respectively. It should be noted that fluctuations in the level of subsurface water could occur due to variations in rainfall, temperature, and other factors not evident at the time our observations were made.

FINDINGS

Based upon the results of our investigation, it is our opinion that, from an engineering geologic perspective, the subject property may be subdivided as planned. It is our opinion that the primary geologic constraints to the proposed building sites and access road include the potential for strong to very strong seismic shaking from a large earthquake on at least one of the nearby faults.

Groundwater Recharge

Based on our observations in the test pits, observations of the poor surface drainage in the lower portion of the site, and the results of the grain size distribution tests performed on samples from the pits, it is our opinion that this area of the property is not suitable as a groundwater recharge basin. The materials encountered in these pits to depths below the water table are alluvial fan deposits and not the bedrock material associated with known aquifers. In our opinion, the amount of fine-grained material (silt and clay) within these deposits precludes the rapid downward percolation of water that

would be necessary for this area to be considered a groundwater recharge basin. The fact that standing water was observed on the ground surface in the lower portions of the site days after rainfall reinforces the slow percolation rates associated with, and low permeability of, these materials.

Landsliding

Our investigation showed that there is no evidence of recent landsliding on the property in the proposed building areas. Based on observations in our test pits, it is our opinion that the lower portion of the site is not located within the toe of an old landslide as shown on Figure 3. Based on the results of this investigation, it is also our opinion that the queried landslide shown on Figure 3 is an alluvial fan and the lower portion of this site is underlain by the distal end of the alluvial fan. The materials encountered in our test pits in this area are comprised of Quaternary age alluvial fan deposits that appear to be the result of numerous episodes of migrating seasonal stream flows that have transported the sandy to clayey materials downslope to the toe of the hill.

In addition, based on geomorphic observations, it is our opinion that this alluvial fan is a relatively old feature. Several residences and Big Tree Lane have been constructed on the upper portions of the fan. In our opinion, the potential for debris flows or renewed alluvial deposition on the property is negligible, based upon our observations of the gentle slope gradients of the fan and the current lack of driving forces.

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Because of the moderate slopes and the layer of non-supportive colluvial soil that blankets the proposed building site, the occurrence of a new shallow landslide within or adjacent to the subject property in the areas of the proposed residences cannot be excluded. A new shallow landslide in these areas could be triggered by excessive precipitation or strong ground shaking associated with an earthquake. In our opinion, landslides of this nature should not constitute an immediate threat to the integrity of the proposed residences and associated improvements, provided that they are designed and constructed in accordance with the recommendations provided in a design level geotechnical investigation report. In our opinion, the potential for deep-seated landsliding in the immediate vicinity of the two building envelopes is negligible.

We understand that the geotechnical engineer is conducting a slope stability analysis of the slopes in the vicinity of the two building sites. The results of that analysis must be used when determining the foundation type and depth for the proposed improvements.

The long-term stability of many hillside areas is difficult to predict. A hillside will remain stable only as long as the existing slope equilibrium is not disturbed by natural processes or by the acts of Man. Landslides can be activated by a number of natural processes, such as the loss of support at the bottom of a slope by stream erosion or the reduction of soil strength by an increase in groundwater level from excessive precipitation. Artificial processes caused by Man may include improper grading activities; or the introduction of excess water through excessive irrigation, improperly designed or constructed leachfields, or poorly controlled surface runoff.

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It should be noted that although our knowledge of the causes and mechanisms of landslides has greatly increased in recent years, it is not yet possible to predict with certainty exactly when and where all landslides will occur. At some time over the span of thousands of years, most hillsides will experience landslide movement as mountains are reduced to plains. Therefore, a small, but unknown, level of risk is always present to structures located in hilly terrain. Owners of property located in these areas must be aware of, and willing to accept, this unknown level of risk.

Liquefaction

Liquefaction is a process where saturated unconsolidated materials (sand, gravel, and some silt) loose their strength and behave as a fluid. When this occurs, it may lead to loss of bearing strength of the soil, which may in turn result in foundation failure for any structure supported on these materials. Liquefaction most commonly occurs as a result of intense shaking of the saturated materials during an earthquake. Because groundwater was encountered at depths of near 20 feet in the proposed building sites, it is our opinion that the potential for liquefaction of the surface materials at these sites during a strong earthquake is low. However, the geotechnical engineer should include the effects of liquefaction of the deeper saturated materials as part of their slope stability analysis.

Seismicity

Based on our review of geologic maps and aerial photographs, it is our opinion that the potential for fault rupture through the site is negligible. However, because of the close proximity to the Zayante

UPP GEOTECHNOLOGY, INC.
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August 21, 2006
Project No. 2798.2L1
Serial No. 14181

Mr. Nathan Lewis
c/o STEPHEN GRAVES AND ASSOCIATES
2735 Porter Street
Soquel, CA 95073

SUBJECT: SUPPLEMENTAL GEOLOGIC REVIEW
LANDS OF LEWIS
711 LARKIN VALLEY ROAD
SANTA CRUZ COUNTY, CALIFORNIA

Dear Mr. Lewis:

As you requested, we have provided a supplemental geologic review of additional test borings, subsurface interpretations, and slope stability analyses performed by the project geotechnical consultant, Ms. Becky Dees of Dees and Associates, for the proposed subdivision of your property located at 711 Larkin Valley Road in unincorporated Santa Cruz County, California.

Our Geologic Investigation report (dated May 19, 2005) presented our geologic findings and subsurface investigation results. That investigation included the excavation of three test borings and four exploration test pits. Since that time, the project geotechnical consultant has performed additional subsurface investigations by excavating eight additional test borings. Our representative was on site with Ms. Dees to observe the excavation and collect samples for laboratory classification from the first three supplemental borings (Borings 4 through 6) on June 29, 2005. We have since been provided with copies of Ms. Dees' boring logs for Borings 7 through 11.

Our original report provided a geologic cross-section based on our original three borings and topographic surveying by our representatives using a Nikon electronic total-station. Ms. Dees has modified our cross-section based on the supplemental subsurface investigation, and has extended the cross-section further uphill, based on the topographic map for the property prepared by the civil engineer. Ms. Dees has also performed additional laboratory testing on samples from the supplemental borings. The revised geologic cross-section and laboratory testing were used in new slope stability analyses.

Based on our review of the provided logs and our re-evaluation of samples obtained from Borings 1 through 6, it is our opinion that the interpretation of the subsurface conditions as shown on Ms. Dees' revised geologic cross-section both conforms with our site observations and makes sense from an engineering geologic standpoint.

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We appreciate the opportunity to have provided these review services. If you have any questions, please call.

Yours very truly,

UPP GEOTECHNOLOGY, INC.

Christopher R. Hundemer
Senior Engineering Geologist
Certified Engineering Geologist 2314

CRH/RRU:jc

Copies: Addressee (5)

UPP GEOTECHNOLOGY, INC.

Engineering Geology • Geotechnical Engineering

February 21, 2007
Project No. 2798.2L2
Serial No. 14552

Mr. Nathan Lewis
c/o STEPHEN GRAVES AND ASSOCIATES
2735 Porter Street
Soquel, CA 95073

SUBJECT: SUPPLEMENTAL GEOLOGIC INFORMATION
AND RESPONSE TO COUNTY PLAN CHECK COMMENTS
LEWIS PROPERTY
711 LARKIN VALLEY ROAD
SANTA CRUZ COUNTY, CALIFORNIA

Dear Mr. Lewis:

As you requested, we have conducted supplemental geologic analyses and are providing supplemental geologic information in response to plan check comments raised by the County of Santa Cruz in their review letter dated November 2, 2006. We have previously submitted a Geologic Investigation report for the property, dated May 19, 2005, and a Supplemental Geologic Review letter of the project Geotechnical Investigation report, dated August 21, 2006

As part of their review, the County Geologist, Mr. Joe Hanna, spoke with Rogers Johnson, CEG. A formal letter or other form of written communication documenting Mr. Johnson's interpretation of the site geology has not been produced. We understand from that conversation, that Mr. Johnson indicated that this site has a similar surface and subsurface expression as several other sites on the south side of Larkin Valley that are impacted by older landslides.

The questions raised by the County, with each response are provided below:

1. ***Engage in Mr. Johnson's above-mentioned hypothesis, and have the current project geologist and engineers discuss their interpretation of the geologic processes that have resulted in the new cross-section presented in the Dees and Associates report.***

   Based on our review of the site and regional topography from field reconnaissances, our review of stereo-paired aerial photographs, and our review of the logs of subsurface explorations on the site and at other sites along the south side of the valley, it is our opinion that older landslides do not impact the site.

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The surface topography at the site is similar to that of several sites along the south side of the valley southeast of the property. We observed that a mid-slope bench exists that is relatively continuous for a length of approximately 1 mile approximately 70 to 100 feet higher in elevation than the base of the valley (see Figure 1, Local Air Photo Interpretation Map). The bench is parallel with the floor of the valley, trending roughly northwest-southeast, and plunging to the southeast. We interpret this bench to be the result of large-scale uplift and erosion of the hillside on the southern side of the valley.

The subject property is located at the northwestern limits of this bench. In our opinion, the northwest end of this bench has been truncated by the alluvial fan extending onto the lower portion of the property as mapped in our original report. As described in our report, it is our opinion that the queried landslide shown on the property northwest of the site is this alluvial fan, which encroaches the lower portion of the site (see Figure 1).

It should be noted that this mid-slope bench is not shown to be located within mapped landslides on the Preliminary Map of Landslide Deposits in Santa Cruz County (Cooper-Clark and Associates, 1975) (see Figure 2, Regional Landslide Map). Three small "definite" slide deposits are mapped at the toe of the slope approximately 3,000 feet southeast of the property (see Figure 2).

The Holocene age colluvium mapped in this area and encountered in the subsurface exploration in this area of the property has been deposited and has accumulated on this mid-slope bench, and appears to be derived from the Aromas Sand materials located at the crest of the hill.

We have compiled a geologic cross-section through the entire property, extending beyond the property to the west to the crest of the ridge, and beyond the property to the northeast up the flank on the north side of the valley (see Figure 3, Regional Geologic Cross-Section A-A'). The location of the cross-section is shown on Figure 1.

In our opinion, the clay unit encountered at the bottom of several of the test borings is likely a discontinuous clay layer located within the Fluvial Lithofacies member of the Aromas Sand formation. The Aromas sand formation is described as a *"heterogeneous sequence of eolian and fluvial sand, silt, clay and gravel. Several angular unconformities present in unit, with older deposits more complexly jointed, folded, and faulted than younger deposits. Total thickness may be more than 800 feet"*.

The Fluvial Lithofacies member is generally described as *"semi-consolidated, heterogeneous, moderately to poorly sorted silty, clay, sand, and gravel. Deposited by meandering and braided streams"*. The subsurface shown on Figure 3 is based upon the subsurface information obtained from test pits and borings at the site, and our interpretation of the regional geology within this unit.

2. ***Clarify how the location of the groundwater was determined in the cross-section south of Boring 11 and around Trench 2.***

   The shown location of the groundwater south of Boring 11 is the maximum probable groundwater elevation based on our interpretation of the regional geology and our combined experience as a Certified Engineering Geologist and Certified Hydrogeologist.

   Groundwater was encountered at the base of our Exploration Pit 2 located in the northern portion of the property at a depth of approximately 7 feet.

We appreciate the opportunity to provide this supplemental information. If you have any further questions, please feel free to call.

Yours very truly,

UPP GEOTECHNOLOGY, INC.

Christopher R. Hundemer
Senior Engineering Geologist
Certified Engineering Geologist 2314

R. Rexford Upp, Principal
Certified Engineering Geologist 1083
Certified Hydrogeologist 62

CRH/RRU:jc

Copies: Addressee (4)
Ms. Becky Dees (1)

Attachments: Figure 1, Local Air Photo Interpretation Map
Figure 2, Regional Landslide Map
Figure 3, Regional Geologic Cross-Section A-A'

ATTACHMENT 3

Dees & Associates, Inc.
Geotechnical Engineers
501 Mission Street, Suite 8A Santa Cruz, CA 95060 Phone (831) 427-1770 Fax (831) 427-1794

August 21, 2006 Project No. SCR-0012

MR. NATHAN LEWIS
% Stephen Graves & Associates
2735 Porter Street
Soquel, California 95073

Subject: Geotechnical Investigation

Reference: Proposed 3-Lot Minor Land Division and Two New Single Family Residences
711 Larkin Valley Road
APN 049-121-23
Santa Cruz County, California

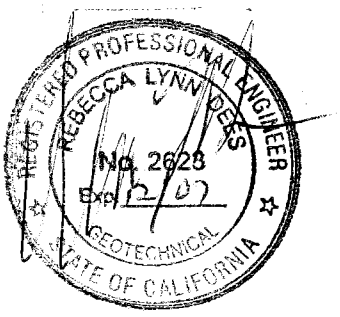
Dear Mr. Lewis:

As requested, we have completed a Geotechnical Investigation for the proposed 3-lot minor land division and two new single family residences proposed at the referenced site.

This report presents the results, conclusions and recommendations of our investigation. If you have any questions regarding this report, please call our office.

Very truly yours,

DEES & ASSOCIATES, INC.



Rebecca L. Dees
Geotechnical Engineer
G.E. 2623

RLD/bd

Copies: 6 to Addressee
1 to Upp Geotechnology

ATTACHMENT 4

GEOTECHNICAL INVESTIGATION

Introduction

This report presents the results of our Geotechnical Investigation for a 3-lot minor land division proposed at the referenced site in the Santa Cruz County, California, Figure A1. The 17-acre site is developed with a driveway, single family residence and detached garage. The project consists of a 3-lot minor land division and the construction of two new single family residences. The new residences will be located on gentle slopes above the existing improvements. A new driveway will come off Big Tree Lane and provide access to the two proposed homesites.

A Geologic report was prepared for the site by Upp Geotechnology to determine potential geologic hazards at each homesite and to designate geologically feasible building envelopes for the proposed improvements. We have worked closely with the project geologist during our investigation and have utilized their geologic site map and cross section in our analyses.

Purpose and Scope

The purpose of our investigation was to explore and evaluate surface and near surface soil conditions in the vicinity of the proposed improvements and develop geotechnical recommendations and design criteria for the proposed project.

The specific scope of our services was as follows:

1. A site reconnaissance and review of available data in our files pertinent to the site and vicinity.

2. Review of the May 19, 2005 Geologic report prepared for the site by Upp Geotechnology.

3. Discussions and on-site meetings with Joseph Hanna, Santa Cruz County Geologist, Stephen Graves & Associates, Upp Geotechnology and Nathan Lewis regarding the proposed development.

4. Exploration of subsurface conditions at the site with eleven (11) exploratory test borings drilled from 27.5 to 100 feet below existing grades and four (4) test pits excavated 5 to 13 feet below grade. We also installed two piezometers at the site to monitor groundwater levels.

5. Representative samples of the subsoils were retrieved from the borings at selected depths or strata changes. The samples were returned to the laboratory for testing. Laboratory testing included grain size analysis, Atterberg Limits, saturated and in-situ direct shear tests and moisture density relationships.

6. Computerized slope stability analyses of the slopes above and below the proposed homesites.

7. Computerized liquefaction analysis of submerged soils.

8. Engineering analysis and evaluation of the resulting data. Based on our findings, we have developed geotechnical design criteria for general site grading, building foundations, retaining walls, concrete slabs-on-grade, and general site drainage and erosion control.

9. Preparation of this report presenting the results of our investigation.

ATTACHMENT 4

Project Location and Description

The site is located at 711 Larkin Valley Road in the Aptos area of Santa Cruz County, California, Figure 1. The 17-acre rectangular shaped parcel is approximately 390 feet wide and 2000 feet deep and is bordered by Larkin Valley Road to the northeast, Big Tree Lane to the northwest, residences to southeast and undeveloped property to the southwest.

The site and vicinity generally slope to the northwest towards Larkin Valley Road with slope gradients on the order of 10 to 45 percent. The northern portion of the site within about 350 feet of Larkin Valley Road is very gently sloping with slope gradients on the order of 5 to 15 percent. An existing single family residence and detached garage are located in the lower area of the site. A gravel driveway provides access to the homesite. A 40 foot high (±), 40 to 45 percent slope climbs up behind the lower improved area to a 300 foot long by 300 foot wide (±) terrace with 3 to 11 percent slopes. The steep slope separating the upper terrace and lower meadow area becomes gentler to the west where it meets the mouth of a gently sloping valley coming down the slope. The gravel driveway continues up to the terrace along the northwest edge of the site. A new single family residence is proposed on the terrace. The slope behind the terrace steepens to 40 percent slopes up to a small knoll. A second new single family residence is proposed at the near the toe of the slope on 20 to 29 percent slopes. See Figure A2 for the topography in the site vicinity. See Figure A3 for the site topography and the location of existing and proposed improvements.

Drainage at the site is by sheet flow to a gently sloping drainage valley that begins near the southern corner of the site, crosses the back third of the property, flows down the slope near the property to the northwest then back across the front third of the site before existing at the northeast corner into the drainage along the south side of Larking Valley Road.

The site is generally vegetated with clusters of oak and madrone trees and grasses. The lower meadow area and the terrace where the proposed homesites are proposed are mostly grass.

Field Investigation,

Subsurface conditions at the site were investigated with eleven (11) exploratory borings drilled between 27.5 to 100 feet below existing grades and four (4) test pits excavated 5 to 13 feet below grade. Four test pits were excavated at the site on May 20, 2004 with a backhoe bucket. Borings 1, 2 and 3 were drilled with 4-inch diameter solid flight auger equipment mounted on a truck on May 6, 2005. Borings 4, 5 and 6 were drilled on June 29, 2005 with 8-inch diameter hollow stem augers to facilitate sampling below the groundwater table. Borings 7 to 11 were drilled on March 7, 2006 with 6-inch diameter solid flight augers primarily to probe the submerged soils to determine the depth to firm clayey soil. We returned to the site and installed two piezometers to monitor groundwater levels. We also reviewed test pit logs excavated by the geologist in the vicinity of the existing residence.

The approximate locations of the exploratory borings and test pits are indicated on our Boring Site Plan, Figure A3. Our Boring Site Plan is a based on a reduced copy of the site topographic map provided to us.

Representative soil samples were obtained from the exploratory borings at selected depths, or at major strata changes. These samples were recovered using the 3.0 inch O.D. Modified California Sampler (L) or the Standard Terzaghi Sampler (T). The penetration resistance blow counts noted on the boring logs were obtained as the sampler was dynamically driven into the in situ soil. The process was performed by dropping a 140-pound hammer a 30-inch free fall distance and driving the sampler 6 to 18 inches and recording the number of blows for each 6-inch penetration interval. The blows recorded on the boring logs present the accumulated number of blows that were required to drive the last 12 inches. The blow count for samples obtained below the groundwater table in Borings 1 to 3 may not be valid due to the difficulty in maintaining an open boring and underwater

sampling with solid flight augers. The blow counts obtained in Borings 4 to 6 were obtained using hollow stem augers and represent the most credible blow counts for the subsoils.

The soils encountered in the boring were continuously logged in the field and described in accordance with the Unified Soil Classification System (ASTM D2487 and D2488), Figure A4. The logs of our test borings are included on Figures A5 to A21 of this report. The test pit logs are included on Figures A22 to A25 of this report. The logs denote subsurface conditions at the locations and time observed, and it is not warranted that they are representative of subsurface conditions at other locations or times.

Laboratory Testing

The laboratory testing program was directed toward a determination of the physical and engineering properties of the soils underlying the site. Moisture content and dry density tests were performed on representative soil samples in order to determine the consistency of the soil and the moisture variation throughout the explored soil profile. Saturated and un-saturated direct shear tests and in-situ penetration testing were performed to determine the strength parameters of the subsoils. Grain size analyses were performed to aid in soil classification and for use in our liquefaction analysis. The plasticity index of the deep clayey soil was determined to aid in developing residual strength parameters for the clay in our slope stability analysis.

The results of all field and laboratory testing appear on the test boring logs opposite the sample tested.

Subsurface Soil Conditions

The County of Santa Cruz Geologic Map (Brabb) indicates the site is underlain by colluvium over fluvial Aromas sand, Figure A26. The geologic report indicates the subsoils consist of eolian sands over fluvial clays. The eolian sands are described as moderately well sorted eolian sand. The fluvial soils are described as poorly sorted silt, clay, sand and gravel.

After completion of the geologic report, eight more borings were drilled at the site to develop a more complete profile of the subsoils. Our borings indicate the subsoils beneath the two proposed building sites consist of 10 to 20 feet of silty sand with binder over 10 to 80 feet of fine grained silty sand over silty clay. Refer to Figure A27 for a cross section indicating the subsoils at the site.

Groundwater

Perched groundwater was encountered during our investigation. The clay layer below the site forms bowl shapes that collect groundwater. The groundwater table was higher then top edge of the bowls and a continuous groundwater surface was encountered from the slope above the proposed homesites down to the valley at the base of the slope, Figure A27. The groundwater table is about 20 feet below the elevation of Building Site No. 1 and 12 to 40 feet below the elevation of Building Site No. 2.

Our investigation has spanned two winter seasons with better than average rainfall and groundwater levels have not varied considerably over this time period. The groundwater levels observed at the site appear to represent average conditions that span both winter and summer months. However, groundwater levels may vary due to seasonal variations and other factors not evident during our investigation.

Geologic Hazards

Potential geologic hazards that could affect the project site include strong seismic shaking, liquefaction, lateral spreading and landsliding. The potential for each of these geologic hazards are discussed in the following sections. A more detailed discussion of geologic hazards can be found in the Upp Geotechnology Geologic Report, dated July 31, 2006.

Seismic Shaking

The project site is located about 9.4 km (5.8 miles) southwest of the San Andreas Fault zone, about 22.7 km (14.0 miles) northwest of the San Gregorio Fault and 3.7 km (2.3 miles) southwest of the Zayante Fault. The San Andreas Fault is considered to be a Seismic Fault Source Type A, according to the 1997 UBC and the Zayante Fault is considered to be Seismic Fault Source Type B, according to the 1997 UBC. Type A faults have Moment magnitudes greater than 7 and a creep rate greater than 5mm per year. Type B faults have Moment magnitudes between 6.5 and 7 and a creep rate between 2 and 5mm per year.

The San Andreas Fault is the largest and most active of the faults, however, each fault is considered capable of generating moderate to severe ground shaking. It is reasonable to assume that the proposed development will be subject to at least one moderate to severe earthquake from one of the faults during the next fifty years. Peak ground accelerations for the site were provided in the Upp geologic report.

Structures designed in accordance with the most current seismic design codes should react well to seismic shaking. The underlying soils may be classified as a "Soil Type S_D" for analysis using the 1997 UBC seismic design provisions.

Liquefaction

Liquefaction occurs when saturated fine grained sands, silts and sensitive clays are subject to shaking during an earthquake and the water pressure within the pores build up leading to loss of strength. The excess pore water pressures then start to dissipate upwards and side ways. The primary movement is in an upward direction towards the ground surface which often results in ground settlement. Lateral dissipation of pore pressures could result in lateral spreading if soils liquefy near a slope face.

An analysis of the liquefaction potential of the soils underlying the site was conducted using the computer program LiquefyPro (CivilTech 1998). The LiquefyPro liquefaction program analyzes the liquefaction resistance of the sandy layers using the liquefaction resistance proposed by Blake, T.F (1997) and normalized SPT blow count ($N_{1\text{-}60}$) proposed by Liao & Whitman (1986). Fines corrections were performed using methods developed by Stark/Olsen. Settlement analysis methods were developed by Ishihara/Yoshimine.

The liquefaction potential at the site was analyzed using the Peak Ground Acceleration (PGA) of 0.48g provided by the project geologist.

The results of the liquefaction analysis indicate some of the submerged sands have a potential to liquefy during the design earthquake. Refer to Figures B1 and B2.

Effects of Liquefaction

Liquefaction is usually manifested in one or more of the following ways: shear strength loss, lateral spreading, loss of axial and lateral support of foundations, sand boils and compaction settlement. A reduction in shear strength is anticipated in the potentially liquefiable soils 18 to 35 feet below grade during and shortly after seismic shaking. The proposed improvements will be situated at least 15 feet above the groundwater table and foundations will be situated well above the potentially liquefiable soils. We do not anticipate surface effects from liquefaction due to the thickness of the overlying non-liquefiable soil layer. The surface of the potentially liquefiable soils lies below the elevation of Larkin Valley Road at the base of the slope. We also do not anticipate lateral spreading at the site due to the depth of the liquefiable soils in relation to the slope.

Settlement of the liquefied soils may occur during the design earthquake. Our calculations indicate total and differential settlements at the site will be on the order of 2.5 and 1.3 inches respectively for

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a 0.48g earthquake on the nearby San Andreas Fault.

Slope Stability and Landsliding

The Santa Cruz County landslide map indicates a questionable landslide exists on the slope west of the site. The map indicates the landslide fanned out at the base of the slope in the vicinity of the existing residence, Figure C1 and A2. The geologic report indicates the fan at the base of the slope is an alluvial fan and not a landslide and there is no evidence of recent landsliding at the site.

To evaluate the potential for future landslides at the site, the slopes above and below the proposed building sites were analyzed using the stability program STABL for Windows, Version 2.0, developed by Geotechnical Software Solutions, LLC. STABL is a computer program for analysis of slope stability by limit equilibrium methods using Bishop's Simplified Method, Janbu's Simplified Method and the Spencer Method. The program calculates the factor of safety for different slip surfaces until it finds the ten most critical trial failure surfaces. Both shallow and deep seated landslide failures were modeled in our analysis.

Our slope model was developed in conformance with the geologic cross section provided to us. The geologic section was revised to reflect the soils encountered in the borings drilled after the geologic report was completed. A graphical representation of the site's subsurface soil profile is presented on Figure 27.

A peak ground acceleration of 0.48g was provided to us by the project geologist. A seismic coefficient (Ky) of 0.303g was used in our slope stability model. The seismic coefficient was determined using a 5 cm Newmark Displacement and the Bray, Rathje Seismic Displacement Screen Procedure (per the recommendations of SP117), Figure C2.

Soil strength parameters were determined from saturated and un-saturated direct shear tests and from the penetration resistance encountered during sampling. The soil strengths for the silty sands with clay binder encountered at the ground surface, the soil encountered at the top of the slope north of building envelope No. 2 and the clays were determined from saturated direct shear tests. The soil strengths used for the unsaturated silty sands located above the groundwater table were an average of the saturated and unsaturated shear strengths. Ultimate shear strengths were used to model the liquefied strength of the submerged sands during an earthquake. Ultimate shear strengths were determined with saturated direct shear tests. Residual shear strengths were used for the clayey soils to model long term static conditions. Residual soil strengths were determined using methods developed by Stark & McCone (2001). The results of our laboratory shear tests are included in Appendix D.

In accordance with SP117, slopes with a factor-of-safety less than 1.1 were considered to fail the screen procedure and slopes with a factor-of-safety greater than 1.1 were considered to pass the screen procedure. Our analyses indicate the slopes above and below the proposed homesites are stable under static and seismic conditions with minimum factors-of-safety on the order of 1.1 to 1.9 under seismic conditions and 1.5 to 4.7 under static conditions. The slope has the lowest factor of safety, FS = 1.1, when the submerged sands are in a liquefied state during seismic shaking.

Graphical representations of our slope stability analyses are included in Appendix C.

DISCUSSIONS AND CONCLUSIONS

Based on the results of our investigation, the two new single family residences proposed at the site are feasible provided the recommendations presented in this report and the geologic report are incorporated into the design and construction of the proposed development and maintained for the life of the project. Our investigation was limited to the building sites indicated on Figure 3A. Structures located outside these areas require addition geotechnical analysis prior to constructing improvements.

Primary geotechnical concerns for development of the site include: 1) ensuring foundations penetrate loose topsoil and are embedded into firm native soil or compacted engineered fill, 2) designing foundations to mitigate potential differential settlements from liquefaction settlement, 3) setting improvements back from steep slopes and designing for strong seismic shaking.

The surface soils at the site are medium dense in the proposed homesites. A thin layer of loose sand exists on the slope in the vicinity of Building Site No. 1 and small mounds of fill exist on Building Site No. 2. Foundations should penetrate all fill and loose soil and be embedded into firm native soil.

Foundations should consist of continuous interior and exterior footings tied into grids no more than 15 feet in any direction and the foundation should be designed to resist up to 2 inches of differential settlement between adjacent footings or be designed to span an 8 foot diameter void.

The owner and all subsequent owners of the property should fully understand that foundations designed to mitigate liquefaction settlement are not guaranteed to be repair free after a large earthquake event. Cosmetic and minor structural damage may result especially if total and differential settlements are larger than those predicted. The recommendations of this report are intended to reduce the liquefaction hazard to the structure to an acceptable level of risk. Structures located within the building envelope indicated on Figure 3A that are designed and constructed in accordance with the recommendations of this report and the geologic report are subject to "Ordinary" risks as defined in the "Scale of Acceptable Risks from Seismic and Non-Seismic Hazards", Appendix D. If the risk levels indicated in Appendix D are not acceptable to the owner, additional recommendations can be developed to reduce the risk to an acceptable level.

Structures should be located at least 20 feet from the top edge of steep slopes.

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RECOMMENDATIONS

The following recommendations may be used in development of project plans and specifications for the proposed development:

Site Grading

1. The geotechnical engineer should be notified **at least four (4) working days prior to any grading or foundation excavating** so the work in the field can be coordinated with the grading contractor, and arrangements for testing and observation can be made. The recommendations of this report are based on the assumption that the geotechnical engineer will perform the required testing and observation during grading and construction. It is the owner's responsibility to make the necessary arrangements for these required services.

2. Where referenced in this report, Percent Relative Compaction and Optimum Moisture Content shall be based on ASTM Test Designation D1557-00.

3. Areas to be graded should be cleared of all obstructions including loose fill, trees not designated to remain and other unsuitable material. Existing depressions or voids created during site clearing should be backfilled with engineered fill.

4. Cleared areas should then be stripped of organic-laden topsoil. Stripping depth should be from 2 to 4 inches. Actual depth of stripping should be determined in the field by the geotechnical engineer. Strippings should be wasted off-site or stockpiled for use in landscaped areas if desired.

5. Areas to receive engineered fill should be scarified to a depth of 6 inches, moisture conditioned, and compacted to at least 90 percent relative compaction. Portions of the site may need to be moisture conditioned to achieve suitable moisture content for compaction. These areas may then be brought to design grade with engineered fill.

6. Engineered fill should be moisture conditioned, placed in thin lifts not exceeding 8 inches (loose) and compacted to at least 90 percent relative compaction. The upper 8 inches of pavement subgrades should be compacted to 95 percent relative compaction. The aggregate base below pavements should also be compacted to at least 95 percent relative compaction.

7. The on-site soils are suitable for use as engineered fill provided they are properly moisture conditioned. Engineered fill should be free of organic material, contain no rocks or clods greater than 6 inches in diameter, with no more than 15 percent larger than 4 inches and have a plasticity index (PI) less than15. We estimate shrinkage factors of about 20 percent for the on-site materials when used in engineered fills.

8. Permanent cut and fill slopes should be inclined less than 2:1 (horizontal to vertical). Fill slopes should be keyed and benched into firm native soil with gravel subdrains placed at the back of keys and benches to intercept potential seepage water. Keys for fill slopes should be embedded at least 24 inches into firm native soil and should be at least 6 feet wide.

9. Following grading, exposed slopes should be planted as soon as possible with erosion-resistant vegetation.

10. After the earthwork operations have been completed and the geotechnical engineer has finished their observation of the work, no further earthwork operations shall be performed except with the approval of and under the observation of the geotechnical engineer.

Spread Footing Foundations

11. Foundations should consist of continuous interior and exterior footings tied into grids no more than 15 feet in any direction. The foundation should be designed to resist up to 2 inches of differential settlement between adjacent footings or be designed to span an 8 foot diameter void to mitigate liquefaction settlement.

12. Footings should be embedded at least 12 inches into firm native soil for one-story structures and at least 18 inches into firm native soil for two-story structures. Actual footing depths should be determined in accordance with the anticipated use and applicable design standards. The footings should be reinforced as required by the structural designer based on the actual loads transmitted to the foundation.

13. The foundation trenches should be kept moist and be thoroughly cleaned of slough or loose materials prior to pouring concrete. Footings located adjacent to other footings or utility trenches should have their bearing surfaces founded below an imaginary 1.5:1 plane projected upward from the bottom edge of the adjacent footings or utility trenches.

14. Foundations designed in accordance with the above may be designed for an allowable soil bearing pressure of 2,000 psf for dead plus live loads. This value may be increased by one-third to include short-term seismic and wind loads.

15. Total and differential settlements under the proposed light building loads are anticipated to be less than 1 inch and ½ inch respectively. (Total and differential settlements due to seismic compaction are on the order of 2.5 and 1.3 inches respectively.)

16. Lateral load resistance for structures supported on footings may be developed in friction between the foundation bottom and the supporting subgrade. A friction coefficient of 0.35 may be used in design of spread footings. Where footings are poured neat against compacted engineered fill a passive lateral pressure of 300 pcf, equivalent fluid weight, may be assumed.

17. Prior to placing concrete, foundation excavations should be thoroughly cleaned and observed by the soils engineer.

Retaining Wall Lateral Pressures

18. Retaining walls should be designed to resist lateral earth pressures and any additional surcharge loads.

19. Unrestrained retaining walls should be designed to resist an active equivalent fluid pressure of 35 pcf for level backfills and 45 pcf for sloping backfills inclined up to 2:1 (horizontal to vertical). The walls should also be designed to resist any surcharge loads imposed on the backfill behind the walls. Restrained walls should be designed to resist uniformly applied wall pressure of 21 H psf, where H is the height of the wall, for level backslopes and 27 H for sloping back inclined to 2:1 (horizontal to vertical). The walls should also be designed to resist any surcharge loads imposed on the backfill behind the walls.

20. For seismic design of retaining walls, a dynamic surcharge load of 15 H psf, where H is the height of the wall, should be added to the above active lateral earth pressures.

21. The above lateral pressures assume that the walls are fully drained to prevent hydrostatic pressure behind the walls. Drainage materials behind the wall should consist of Class 1, Type A permeable material (CalTrans Specification 68-1.025) or an approved equivalent. The drainage material should be at least 12 inches thick. The drains should extend from the base of the walls to within 12 inches of the top of the backfill. A perforated pipe should be placed (holes down) about 4 inches above the bottom of the wall and be tied to a suitable drain outlet. Wall backdrains should be

plugged at the surface with clayey material to prevent infiltration of surface runoff into the backdrains.

22. Retaining walls should have their foundations designed in accordance with the *Foundation* section of this report.

Slabs-on-Grade

29. Slabs should be supported on a firm, compacted subgrade. Slab reinforcing should be provided in accordance with the anticipated use and loading of the slab. The reinforcement of exterior slabs should not be tied to the building foundations.

30. These slabs can be expected to suffer some cracking and movement. However, thickened exterior edges, a well-prepared subgrade including premoistening prior to pouring concrete, adequately spaced expansion joints, and good workmanship should minimize cracking and movement.

31. Dees & Associates are not experts in the field of moisture proofing and vapor barriers. In areas where floor wetness would be undesirable, an expert, experienced with moisture transmission and vapor barriers should be consulted. At a minimum, a blanket of 4 inches of free-draining gravel should be placed beneath the floor slab to act as a capillary break. In order to minimize vapor transmission, an impermeable membrane should be placed over the gravel. The membrane should be covered with 2 inches of sand or rounded gravel to protect it during construction. The sand or gravel should be lightly moistened just prior to placing the concrete to aid in curing the concrete.

Site Drainage

32. Thorough control of runoff is essential to the performance of the project and the long term stability of the slopes at the site. Surface runoff from improvements should not be allowed to flow down the slopes in an uncontrolled manner. Berms or lined V-ditches should be constructed at the top of slopes to divert water toward suitable collection facilities as necessary.

33. Surface drainage should include positive gradients around structures and pavements so that surface runoff is not permitted to flow or pond adjacent to foundations and pavements. Surface drainage should be directed away from the building foundations and dispersed on site.

34. Roof gutters should be placed around eaves. Discharge from the roof gutters should be conveyed away from the downspouts with solid conduit pipe and dispersed around the site in a controlled manner.

35. Collected runoff should be dispersed on site away from steep slopes and improvements. Rip rap energy dissipaters or rock filled trenches should be used to dissipate runoff where concentrated runoff is discharged.

Plan Review, Construction Observation and Testing

36. Our firm should be provided the opportunity for a general review of the final project plans prior to construction so that our geotechnical recommendations may be properly interpreted and implemented. If our firm is not accorded the opportunity of making the recommended review, we can assume no responsibility for misinterpretation of our recommendations. We recommend that our office review the project plans prior to submittal to public agencies, to expedite project review. The recommendations presented in this report require our review of final plans and specifications prior to construction and upon our observation and, where necessary, testing of the earthwork and foundation excavations. Observation of grading and foundation excavations allows anticipated soil conditions to be correlated to those actually encountered in the field during construction.

Dees & Associates, Inc.
Geotechnical Engineers
501 Mission Street, Suite 8A Santa Cruz, CA 95060 Phone (831) 427-1770 Fax (831) 427-1794

March 23, 2007 Project No. SCR-0012

MR. NATHAN LEWIS
% Stephen Graves & Associates
2735 Porter Street
Soquel, California 95073

Subject: Response to County of Santa Cruz Review Letter, Dated November 2, 2006

Reference: Proposed Minor Land Division
711 Larkin Valley Road
APN 049-121-23
Santa Cruz County, California

Dear Mr. Lewis:

There were three geotechnical engineering issues (Items 3, 4 and 5) to be addressed by our firm in the County of Santa Cruz Review Letter, dated November 2, 2006. The issues presented by the County and our response are itemized below. All three issues are related and should be considered together.

Item 3) ***Indicate the permeability of the silty sands (with binder), and the sand with silt. State if these materials could act as confining layers.***

The two studies available on the subject of confining layers, Analysis of a Void Distribution Mechanism in Liquefied Soil, by Malvick, Kulasingam, Boulanger and Kutter (2003) and Shear Localization Due to Liquefaction-Induced Void Redistribution in a Layered Slope, by Malvick, Kutter, Boulanger and Kulasingam (2006), indicate that a confining layer is considered to exist if the overlying soil has a lower permeability than the upper soil.

Our firm did not perform permeability testing of the subsoils at the site, however, the surface soils in the vicinity of the proposed improvements contain silt and clay binder and are assumed to be less permeable than the underlying sands with very little fines. Therefore the surface soils could act as a confining layer based on the loose definition of what a confining layer is if the right conditions were to exist. However, there is no evidence that the upper soils will ever act as a confining layer if the conditions for confinement don't exist.

Item 4) Consider pore water flow and pressure redistribution during earthquake shaking. Is there a potential for the development of zones of high void ratios below the silty sands?

The two studies referenced above were performed on slopes that were entirely submerged with the groundwater table located above the ground surface similar to the inslope side of a dam face. Both studies were performed in the laboratory on idealized slope conditions. There have also been case studies where the soils at the toe of an embankment developed high void ratios due to pore pressure redistribution due to the differences in overburden pressure between the middle of the embankment and the toe of the embankment.

Neither the laboratory studies nor the case studies evaluated slope conditions similar to the site conditions encountered at the subject site. Our site conditions differ in that the groundwater table is not located above the ground surface and there are layered zones of liquefiable soils and non-liquefiable soils below the groundwater table. The theory behind the confining layer and "zones of high void ratios" is based on the assumption that the water expelled out of the liquefiable soils has no exit causing water to concentrate at the base of the upper confining layer because of the differences in permeability. In our site, there are zones that don't liquefy surrounding the soils that do liquefy. There is no evidence to suggest that excess pore pressures will concentrate at the upper confining layer under these conditions. However, this is an area of geotechnical

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engineering that is not well understood and further studies will need to be evaluated by the geotechnical community to determine under what conditions this phenomenon does occur.

Item 5) Evaluate the potential for flow failure during or after earthquake shaking. The geometry and stratigraphy near borings 1, 3, 4, 5 and 11 appear conducive to a flow failure during or after an earthquake.

A stability analysis of the slope in the vicinity of borings 1, 3, 4, 5 and 11 was performed to evaluate the potential for slope failures during an earthquake and was presented in our report, dated August 21, 2006. The slopes were found to be stable under seismic conditions. Because the slope was found to be stable under seismic conditions, we did not evaluate the post shaking stability of the slope. A post shaking static analysis was recently performed to provide the post shaking static factors-of-safety for both the upper and lower slopes. Our factors-of-safety were 3.4 for the upper slope and 3.6 for the lower slope. Graphical representations of our recent static analyses are attached.

The ultimate strength of the submerged sands was used in our analysis to determine the potential for flow failures. The peak strength for the submerged sands was C=1088 psf and Phi =41 degrees, the ultimate strength of the submerged sands when fully yielded was C=600 psf and Phi=27 degrees. A "residual undrained shear strength", as defined by Seed and Harder, could not be used for this project because the Seed and Harder method does not provide for residual soil strengths when the equivalent clean sand blow count ,(N1)60-cs, is over 16. The project site has an equivalent clean sand blow count of 23 in the submerged sands.

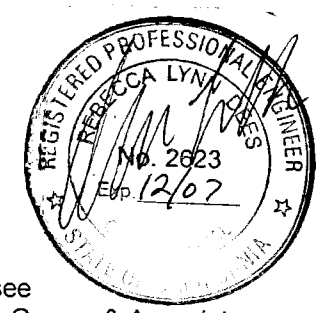
A group meeting was held to discuss the geologic conditions and slope stability in the Larkin Valley area. Our discussions with John Kasunich, Rogers Johnson, Jim Olsen, Rex Upp and Chris Hundemer indicate there has been no evidence of massive lateral spreading in this area of Larkin Valley Road from either the 1906 or 1989 earthquakes. Although, according to John Kasunich there was evidence of one flow failure at the far north end of Larkin Valley during the 1906 earthquake, but none in the vicinity of our project site.

Based on the results of our slope stability analysis, the lack of evidence that flow failures have occurred at the site and discussions with other geotechnical engineers and geologists regarding historic flow failures in the project vicinity, we feel there is a low potential for flow failures during or following earthquake shaking at the project site.

If you have any questions regarding this letter, please call our office.

Very truly yours,

DEES & ASSOCIATES, INC.



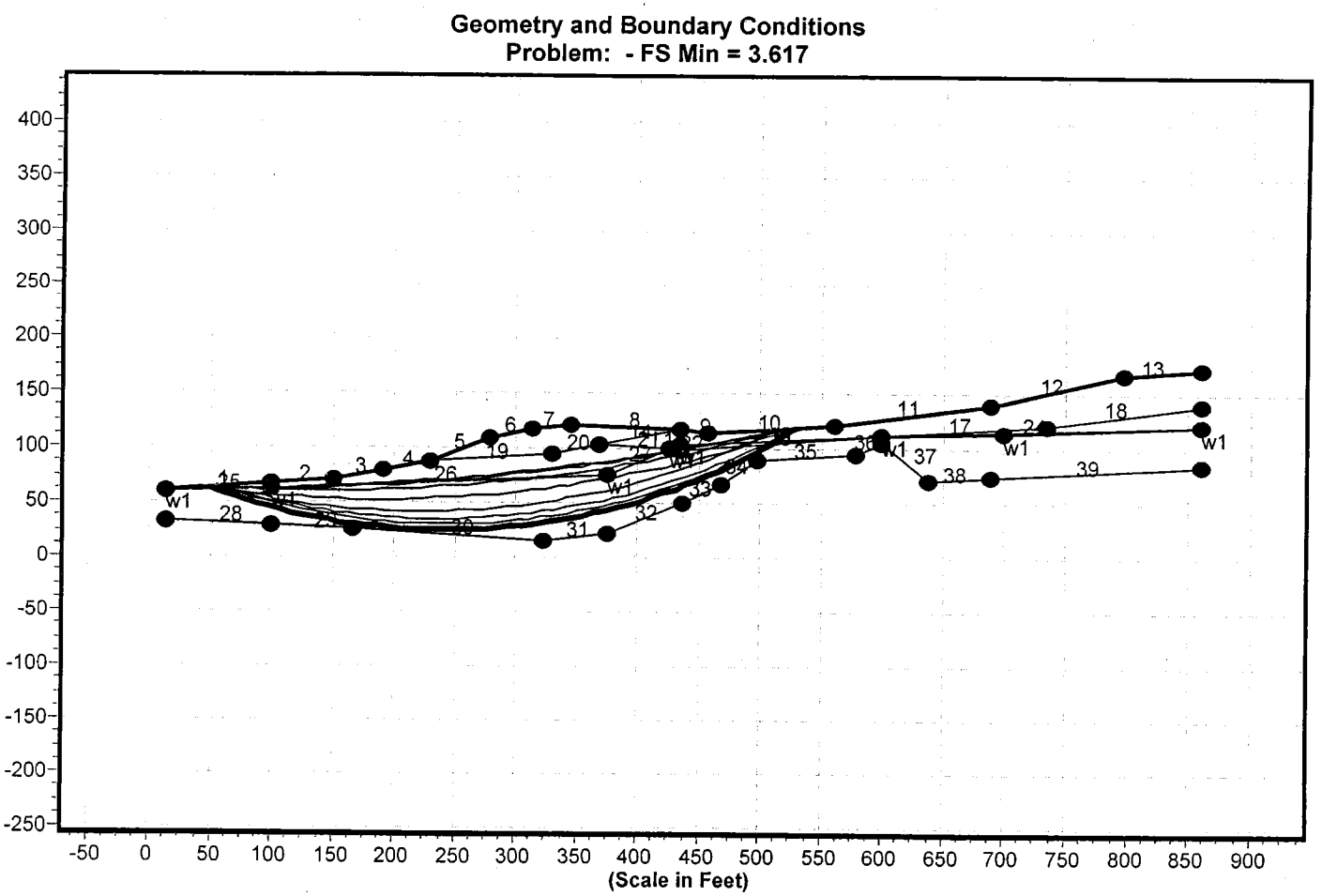
Rebecca L. Dees
Geotechnical Engineer
G.E. 2623

Attachments

Copies: 1 to Addressee
4 to Stephen Graves & Associates
1 to Upp Geotechnology

ATTACHMENT 4

BBD3A STATIC
ULTIMATE SAND



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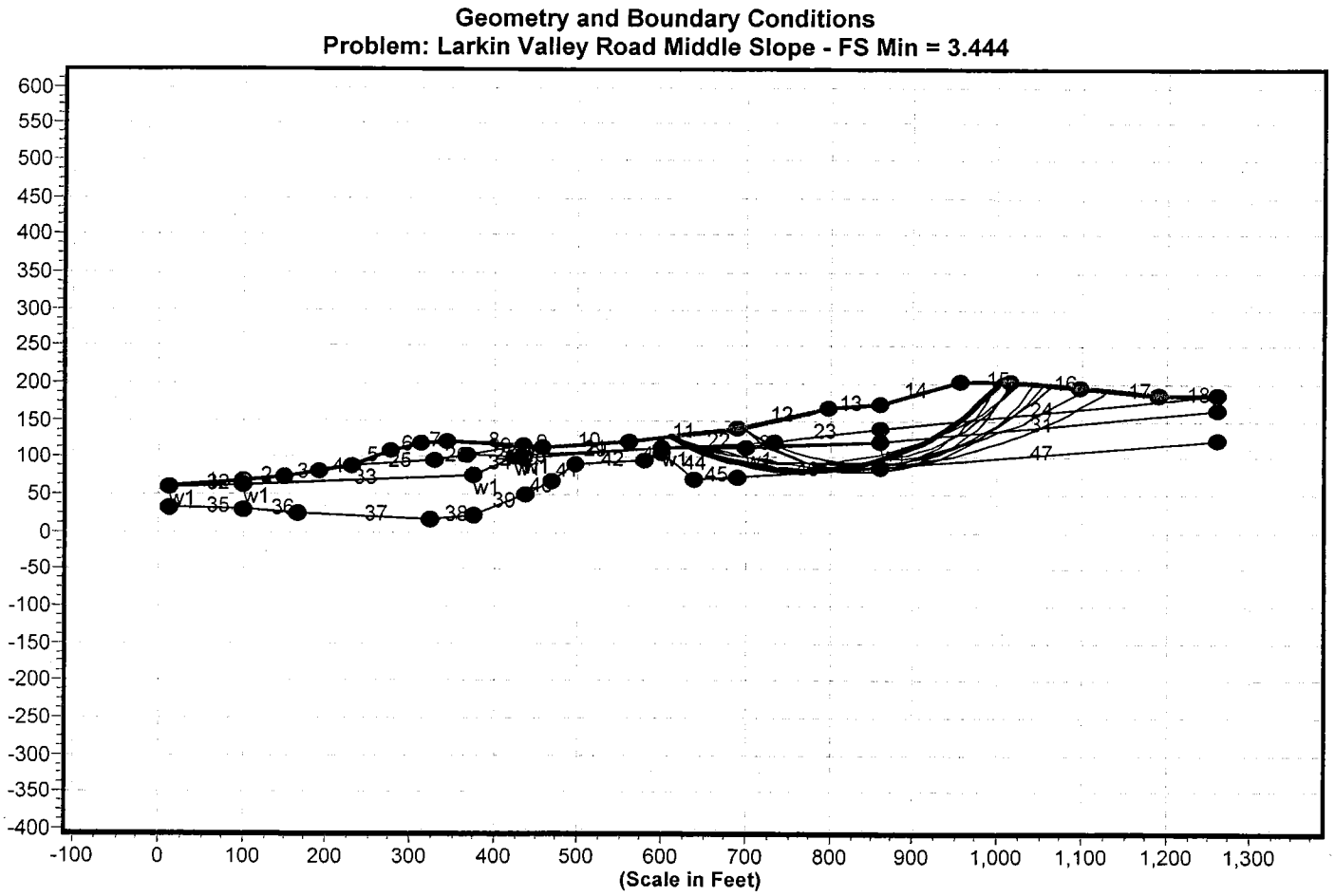
MS5B STATIC
ULTIMATE SAND



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Report Approval

COUNTY OF SANTA CRUZ

PLANNING DEPARTMENT
701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123
TOM BURNS, PLANNING DIRECTOR

April 13, 2007

Steven Graves and Associates
2735 Porter Street
Soquel, CA 95073

Subject: **Review of Engineering Geology Report by UPP Geotechnology, Dated August 21, 2006 and February 21, 2007, Project No. 2798.2L.1; and Geotechnical Engineering Report by Dees and Associates, Dated August, 2006 and March 23, 2007; Job Number SCR-0012; *APN: 049-121-23, Application: 06-0461***

Dear Applicant:

The purpose of this letter is to inform you that the Planning Department *has accepted* the subject report and the following items shall be required:

1. All construction shall comply with the recommendations of the report.

2. Final plans shall reference the report and include a statement that the project shall conform to the report's recommendations.

3. An engineered grading plan is required for any grading on these parcels.

4. Building and development envelopes must be shown on the parcel map. These envelopes must be review and approved by the engineering geologist and geotechnical engineer before recordation, and a letter from these consultants must be submitted to the project planner before recordation.

5. Before final inspection of any building or grading permit, the geotechnical engineer must confirm in writing that all of the construction complies with the recommendations of the geotechnical engineer.

6. Before building or grading permit issuance a *plan review letter* shall be submitted to Environmental Planning. The author of the report shall write the *plan review letter*. The letter shall state that the project plans conform to the report's recommendations.

7. A declaration of Geologic Hazard must be recorded before the issuance of Building Permits for specific parcels.

After building permit issuance the soils engineer and engineering geologist *must remain involved with the project* during construction. Please review the *Notice to Permits Holders* (attached).

(over)

ATTACHMENT 5

ur acceptance of the reports is limited to its technical content. Other project issues such as oning, fire safety, septic or sewer approval, etc. may require resolution by other agencies.

lease call the undersigned at (831) 454-3175 if we can be of any further assistance.

incerely,

e Hanna
ounty Geologist

c: Randall Adams, Project Planner
UPP Geotechnology Inc.
Dee and Associates
File

ATTACHMENT 5

UPP GEOTECHNOLOGY, INC.

Engineering Geology • Geotechnical Engineering

October 5, 2009
Project No. 2798.2L4
Serial No. 15505

Mr. Nathan Lewis
c/o STEPHEN GRAVES AND ASSOCIATES
2735 Porter Street
Soquel, CA 95073

SUBJECT: RESPONSE TO COUNTY COMMENTS
GROUNDWATER RECHARGE ZONE
LEWIS PROPERTY
711 LARKIN VALLEY ROAD
SANTA CRUZ COUNTY, CALIFORNIA

Dear Mr. Lewis

INTRODUCTION

I previously completed a geotechnical evaluation of the Groundwater Recharge (GWR) zone on the Nathan Lewis property located at 711 Larkin Valley Road in unincorporated Santa Cruz County, California. I presented the results of that evaluation in a letter dated July 31, 2009. In addition, we previously have conducted investigations on the site and issued the following reports/letters:

- Supplemental Geologic Information and Response to County Plan Check Comments (Serial No. 14552), dated February 21, 2007
- Supplemental Geologic Review (Serial No. 14181), dated August 21, 2006
- Geologic Investigation (Serial No. 13299), dated May 19, 2005
- Reconnaissance Geologic Investigation (Serial No. 12893), September 24, 2004

In his review letter dated August 24, 2009, the Environmental Health Department's geologist (Mr. Mike Cloud) requested that we address five issues. I have addressed them in the following sections. The numbers correspond to the numbers in Mr. Cloud's letter.

In preparation of my response, I have consulted with Mr. Cloud and others, and reviewed our files and other pertinent documents.

ATTACHMENT 6

1. Soil Classification

The US Soil Conservation Service's (SCS) soil survey map of Santa Cruz County shows three soil units on the subject parcel:

- Danville (125) is shown on the valley floor where the existing house is located. Our test pits in this area held standing water because of the high clay content. We conducted sieve analyses on seven samples from test pits in this area. All the tests showed a higher percent of fine-grained material than reported for the Danville. SCS reports that the Danville has very low percolation rates.

- Baywood (105) is shown on the mid slope area proposed for Parcel B. No sieve tests were done in the upper portion of this unit. SCS reports that the Baywood has high percolation rates.

- Elkhorn (135) is shown on the upper slope area proposed for Parcel C. No sieve tests were done in this area of shallow soil. SCS reports that the Elkhorn has low percolation rates.

Based on the boring log descriptions and percolation test rates, it is my opinion that the soil covering Parcel B should be reclassified as the Elkhorn rather than the Baywood. The Baywood may be located on the lower portions of proposed Parcel C where percolation tests showed high infiltration rates.

2. Groundwater Depths

Our test borings showed fairly shallow perched groundwater in this area. Well reports for the site only included water qualities, not depths. We have not been successful in our attempts to find nearby depths to regional groundwater in Larkin Valley.

3. Cross-Sections

The "inconsistencies" between our May 2005 and February 2007 cross-sections are caused by the addition of more subsurface data obtained in the interim and the smaller scale of the 2007 cross-section (1" = 200') compared to the 2005 cross-section (1" = 40'). A revised and simplified cross-section is attached.

The Logs of Borings 1 to 3 were presented on our 2005 report. The other borings were drilled by the geotechnical engineer, Ms. Becky Dees, for evaluation of slope stability and liquefaction hazards. The logs are included in her reports. The sieve tests she performed were from the deeper soil for liquefaction analyses. The results of the sieve tests we performed on samples taken from pits on Parcel A are presented in our 2005 report.

ATTACHMENT 6

In 2009, the company Environmental Concepts performed seven percolation tests on proposed Parcels B and C. They presented their results in a letter dated July 16, 2009. We showed the results graphically (high rates and low rates) on the plan with our 2009 letter.

4. Updated Cross-Section

See number 3 above.

5. Sieve Analyses

The sieve analyses were done on samples obtained from the test pits. The test laboratory mis-labeled them as from the borings.

Yours very truly,

UPP GEOTECHNOLOGY, INC.

R. Rexford Upp, Principal Geologist
Certified Engineering Geologist 1083

Copies: Addressee (2)
Mr. Mike Cloud (1)

Inclusions: Figure 1, Geologic Cross-Section

ATTACHMENT 6

COUNTY OF SANTA CRUZ

PLANNING DEPARTMENT
701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123
TOM BURNS, PLANNING DIRECTOR

January 21, 2010

Steve Graves
Stephen Graves & Associates
2735 Porter St.
Soquel, CA 95073

Subject: Review of Hydrogeologic Report entitled "Geotechnical Evaluation Groundwater Recharge Zone Lewis Property 711 Larkin Valley Road, Santa Cruz County, California" by Upp Geotechnology, Inc, July 31, 2009; & "Response to County Comments Groundwater Recharge Zone Lewis Property 711 Larkin Valley Road, Santa Cruz County, California" by Upp Geotechnology, Inc, October 5, 2009

EHS Application 09-027, and
Planning Department Application 10-0008
APN 049-121-23,

Dear Mr. Graves,

Staff has reviewed the above referenced reports, subsequent revised cross-section and supporting documents that recommend revising the Primary Groundwater Recharge (PGR) delineation for parcel 049-121-23. Based on review of the data included in the reports and the County's General Plan and Code, staff concurs that with the conclusion of the reports that the majority of the lower portion of this parcel is not in an area of PGR as defined by the County and the zones of PGR on this parcel should be revised.

The requirements for hydrogeologic reports are currently undergoing revision, so staff was more flexible in the review of this report. While most of the data needed to make a determination was included in the data submittal packet, it was not organized in a manner that facilitated its review. Additionally, some requested data, such as the local or regional groundwater level or the geologic data from all site borings was not provided. However, county Environmental Health Services staff did conduct a site visit to confirm the interpretations of the Upp Geotechnology, Inc and the environmental health consultant,

ATTACHMENT 7

Environmental Concepts. Evaluations of future reports will be more insistent upon the reports as having all requested data, in a more organized format and in a stand-alone document.

Discussion

To be considered PGR, a site must be underlain by soils classified by the USDA Soil Conservation Service (SCS) as having a permeability of greater than 2-inches per hour and overlie a geologic unit that yields sufficient amounts of groundwater for community or municipal supplies. Although the subject parcel is underlain by the Aromas formation, which is considered to be one of the major aquifers in the County, the soil types or locations identified on site do not match the types or locations mapped by the Soil Conservation Service.

The northernmost, low-lying portion of the property in proposed Parcel A, is mapped as Danville Loam. The SCS mapped the soil unit immediately to the South of the Danville as Baywood Loam. This includes the southern portion of Parcel A where the existing house is located. Your consultants have noted the high clay content of the soils up to the base of the slope adjacent to proposed Parcel B. It appears that this area should also be mapped as Danville Loam. Additionally, the northern half of Parcel B, lying at a slightly higher elevation that Parcel A, is incorrectly mapped as Baywood loam based on the high clay content of the soil samples and the low percolation rates in the septic system test holes.

The area proposed as Parcel C does appear to have dominantly sandy, high permeability soils derived from either the sandy fluvial facies or aeolian facies of the Aromas formation. The soils in this area are mapped as variants of Elkhorn but many be variants of Baywood. This area of the parcel does qualify as PGR under the County criteria.

Attached is a revised copy of the "Partial Site Plan and Engineering Geologic Map" that was submitted as part of the application packet. Staff has added to the map the estimated contacts between the 3 dominant soil types found on the site; Baywood, Elkhorn and Danville. The portion of the parcel overlain by Baywood, Parcel C, will now be designated as PGR.

Also attached is a copy of the submitted "Geologic Cross-Section." Staff has added to the section the estimated extents of the 3 soil types. Staff has also indicated those areas on the section will now be designated as PGR and non-PGR.

Summary

Staff concurs with your consultants that the northern portion of Parcel 049-121-23 is not in an area of PGR because, although the underlying Aromas Formation is considered to be a significant aquifer in this county, the soil types found on the lower (northern) approximately half the parcel are incorrectly mapped by the SCS as high permeability soils (greater than 2-inches per hour infiltration rate). However, the southern portion of the parcel does meet the high permeability soils criteria and therefore the County will now designate this area as PGR. Staff therefore concurs that Parcels A & B are **not** in PGR, but Parcel C **is** in PGR as defined by County PGR criteria.

If you have any questions regarding these comments, please contact Joseph Hanna, County Geologist at 831 454-3175.

Sincerely,

Joseph Hanna, CEG 1313
County Geologist

Mike Cloud PG
Hydrologist

Attachments: 1) Revised Partial Site Plan and Engineering Geologic Map
2) Revised Geologic Cross-Section

cc: John Ricker, County Environmental Health Services

SANTA CRUZ COUNTY HEALTH SERVICES AGENCY
ENVIRONMENTAL HEALTH SERVICE
701 Ocean Street - Room 312, Santa Cruz, CA 95060 (831) 454-2022

PE4201
#04-073 (A)

SITE EVALUATION

☐ **PRELIMINARY LOT INSPECTION REPORT**
MLD # ____ PROPOSED LOT ____ LOT SIZE ____ SITE LOCATION 71 Larkin Valley Rd. Watsonville
APN 99-121-23 WATER SUPPLY ____ OWNER'S WRITTEN PERMISSION ATTACHED YES __ NO __

05/19/04 9:25AM 00088568 0002
PL4203 IDA $660.00
CHECK $568.00

☑ **SITE EVALUATION**
☑ FULL ☐ SOIL ☐ GROUNDWATER ☐ PERCOLATION ☐ REPAIR ☐ ALTERNATIVE SYSTEM

☐ **OTHER CONSULTATION** ____

REQUESTED BY: Environmental Concepts (NAME) PO. Box 1445 Aptos, Ca 95001 (ADDRESS) 684-1555 (PHONE)

OWNER: Nathan Lewis (NAME) 71 Larkin Valley Rd. Watsonville (ADDRESS) ____ (PHONE)

☐ Item/s checked below do not meet present sewage disposal requirements or require further testing:

- ☐ Soil tests indicate soils not suitable.
- ☐ Lot slope excessive, area has been graded; and/or unable to provide setback from cut bank
- ☐ Winter water table testing required.
- ☐ Tests indicate failure to provide required separation of leaching and seasonal high groundwater.
- ☑ Unable to provide a 100 foot separation between a septic system and a well, spring, stream, or waterway.
- ☐ Inadequate space for both the sewage disposal system and the required future expansion area.
- ☐ Septic area in floodplain.
- ☐ Other ____

☑ Preliminary inspection of this lot indicates suitability for individual sewage disposal using conventional septic technology under standards currently in effect, subject to any limitations identified below.

☐ Water supply must be developed.

☐ Site conditions may be mitigated by alternative technology. Further testing and evaluation is needed.

Design Parameters

Percolation Rate 1-5 6-30 30-60 60-120 Groundwater Depth for Design Purposes 25+

REMARKS: 5/20/04 No Signs of Manzanita Elevation difference from Larkin Valley to T1 = 62'
T1 Slope 10%
0-+ Topsoil
+14 Red Arenas Sand w/some silt
Dry
Need Percs 6-30

NOTE: Preliminary inspections and evaluations do not take into account all factors which are considered in the issuance of a sewage disposal permit. An application for sewage disposal will be subject to further evaluation based on the specific sewage disposal design; the possible presence of geologic hazards, biotic resources, or other site constraints; and, the provisions of the Sewage Disposal Ordinance in effect at the time of permit application.

RST — ENVIRONMENTAL HEALTH SPECIALIST — 6/8/04 DATE — SUPERVISOR — 6/8/04 DATE

PHD-77 (REV. 12/01)

ATTACHMENT 6

SANTA CRUZ COUNTY HEALTH SERVICES AGENCY
ENVIRONMENTAL HEALTH SERVICE
701 Ocean Street - Room 312, Santa Cruz, CA 95060 (831) 454-2022

SITE EVALUATION

☐ **PRELIMINARY LOT INSPECTION REPORT**
MLD # ____ PROPOSED LOT ____ LOT SIZE ____ SITE LOCATION 711 Larkin Valley Rd. Watsonville
APN 99-121-23 WATER SUPPLY ____ OWNER'S WRITTEN PERMISSION ATTACHED YES ☐ NO ☐

☑ **SITE EVALUATION**
☑ FULL ☐ SOIL ☐ GROUNDWATER ☐ PERCOLATION ☐ REPAIR ☐ ALTERNATIVE SYSTEM

05/19/04 DA PROGRAM 0006#9569 0002
PL4201 $560.00
CHECK $560.00

☐ **OTHER CONSULTATION** ____

REQUESTED BY: Environmental Concepts (NAME) P.O. Box 1445 Aptos, Ca 95001 (ADDRESS) 684-4535 (PHONE)

OWNER: Nathan Lewis (NAME) 711 Larkin Valley Rd. Watsonville (ADDRESS) ____ (PHONE)

☐ Item/s checked below do not meet present sewage disposal requirements or require further testing:

- ☐ Soil tests indicate soils not suitable.
- ☐ Lot slope excessive, area has been graded; and/or unable to provide setback from cut bank
- ☐ Winter water table testing required.
- ☐ Tests indicate failure to provide required separation of leaching and seasonal high groundwater.
- ☐ Unable to provide a 100 foot separation between a septic system and a well, spring, stream, or waterway.
- ☐ Inadequate space for both the sewage disposal system and the required future expansion area.
- ☐ Septic area in floodplain.
- ☐ Other ____

☑ Preliminary inspection of this lot indicates suitability for individual sewage disposal using conventional septic technology under standards currently in effect, subject to any limitations identified below.

☑ Water supply must be developed.

☐ Site conditions may be mitigated by alternative technology. Further testing and evaluation is needed.

Design Parameters

Percolation Rate 1-5 6-30 30-60 60-120 Groundwater Depth for Design Purposes 25+

REMARKS: 5/20/04 Slope 10% No Manzanita observed near test hole Need perc 1-5
0-14 Sand
Dry

NOTE: Preliminary inspections and evaluations do not take into account all factors which are considered in the issuance of a sewage disposal permit. An application for sewage disposal will be subject to further evaluation based on the specific sewage disposal design; the possible presence of geologic hazards, biotic resources, or other site constraints; and, the provisions of the Sewage Disposal Ordinance in effect at the time of permit application.

RST — ENVIRONMENTAL HEALTH SPECIALIST
6/8/04 — DATE
SUPERVISOR
6/8/04 — DATE

PHD-72 (REV. 12/01)

Aug. 20 2004 10:53AM P3 FAX NO. : 8316841842 FROM : Environmental Concepts

ATTACHMENT 8

County of Santa Cruz, PLANNING DEPARTMENT

Discretionary Application Comments 10-0030

APN 049-121-23

District Supervisor Review

Routing No: 1 | Review Date: 09/01/2011
SAMANTHA HASCHERT (SHASCHERT) : No Response

:Review Type= SUPERVISOR FOR DISTRICT NO PROJECT REVIEW DESCRIPTION AVAILABLE

Drainage Review

Routing No: 1 | Review Date: 02/24/2010
Complete

DPW DRAINAGE ===== REVIEW ON FEBRUARY 24, 2010 BY TRAVIS RIEBER =========

1. Please provide a tributary drainage area map and calculations demonstrating that the two 12 inch culverts under the road entrances off Larkin Valley Road and the 15 inch culvert under the base rock access road for lots B and C have adequate capacity. Please reference the Santa Cruz County Design Criteria for design requirements. The design criteria can be found on the internet at: http://www.dpw.co.santa-cruz.ca.us/DESIGN%20CRITERIA.PDF
2. The access road is currently base rocked and there is no proposal to change this surface. Based on comments from DPW Survey the access road will be required to be improved to an all weather surface. This improved surface will create new impacts that will require mitigation. The proposed mitigations must maintain predevelopment runoff rates and incorporate methods of design that include both resource and flood control protections, effective for a broad range of storms. Please provide a proposal consistent with County standards. The County would prefer the use of pervious/semi-pervious paving where feasible.

MISCELLANEOUS COMMENT: === REVIEW ON FEBRUARY 24, 2010 BY TRAVIS RIEBER

1. The letter from Dees & Associates dated September 12, 2005 stating the feasibility of onsite retention of development runoff has been received. At the building permit stage for the two new home sites the projects will be required to incorporate Best Management Practices and retention type methods to treat development runoff onsite. Please call the Dept. of Public Works, Storm Water Management Section, from 8:00 am to 12:00 noon if you have questions.

ATTACHMENT 9

Drainage Review

Routing No: 3 | Review Date: 09/01/2011
SAMANTHA HASCHERT (SHASCHERT) : Complete

1. Since the Planning Department is over riding DPW's comments and recommendations by not requiring the two culverts along Larkin Valley Road to be upgraded to meet county design criteria standards we need to have an assessment (for the 10 and 25 year storm events) from the project civil engineer showing the extents of flooding within the county ROW due to the undersized private driveway culverts.

2. The access road is currently base rocked and there is no proposal to change this surface. Based on comments from DPW Survey the access road will be required to be improved to an all weather surface. This improved surface will create new impacts that will require mitigation. The proposed mitigations must maintain predevelopment runoff rates and incorporate methods of design that include both resource and flood control protections, effective for a broad range of storms. Please provide a proposal consistent with County standards. The County would prefer the use of pervious/semi-pervious paving where feasible.

Permit Conditions and Additional Information:

1. Please provide calculations demonstrating safe overflow for a 25 year storm event for each of the proposed replacement culverts. Per part 3 section C 1 of the CDC.

2. Based on the comments from DPW Transportation the existing driveway serving parcel A will need to be removed. Please provide construction details for the restoration of the open channel flow path.

3. More details are needed for the proposed 24" culvert. What size rock will be used for the headwall? Show details for energy dissipation at the outfall of the culvert.

Please call the Dept. of Public Works, Storm Water Management Section, from 8:00 am to 12:00 noon if you have questions.

Environmental Health Review

Routing No: 1 | Review Date: 02/17/2010
JIM SAFRANEK (JSafranek) : Complete

ENVIRONMENTAL HEALTH ==== REVIEW ON FEBRUARY 17, 2010 BY JIM G SAFRANEK

1.A statement from the applicant's geotechnical consultant regarding her analysis of the potential impacts of the site's geology on the onsite sewage disposal location will be required for EHS approval of the MLD. The geotech's septic analysis will need to be reviewed and approved by the County Geologist. This is an EHS completeness issue.

ATTACHMENT 9

granted at the proposed location because an alternative does appear to exist. 3. Soils and geology report update and plan review letters will be required prior to building permit issuance. NOTES TO PLANNER: 1. An archaeological site review was completed (letter dated 7/9/04) and no further review is required. 2. Soils and geologic reports were accepted by the County Geologist on April 13, 2007.

Routing No: 2 | Review Date: 05/10/2011
ROBERT LOVELAND (RLOVELAND) : Incomplete

1. The project biologist (J. Gilchrist) shall delineate the area that was identified as having Monterey spineflower and clearly identify that area on "Sheet T1".
2. The project biologist (J. Gilchrist) shall develop a habitat management plan for San Andreas Oak Woodland (transitional area) and for the area containing Monterey spineflower. Please submit this plan for review and approval.
3. The "Special Forest" line shown on "Sheet T1" ,dated 4/18/11, does represent the county biotic mapping but does not reflect the true extent of the "Special Forest Area" on this parcel. The extent of this area has been discussed and clearly identified in prior conversations and site visits. Please revise "Sheet T1" to reflect the entire extent of "Special Forest".
4. The riparian corridor is represented accurately for the most part on "Sheet T1" except for the area in which the "Development Envelope" is proposed. The 2000 aerial photograph located in the county's GIS database shows riparian vegetation extending further out than what is depicted on the plan sheet. Please remap the edge of riparian vegetation to conform with the 2000 aerial photograph and adjust the "Development Envelope" to be outside of the riparian area.
5. The drainage investigation letter from Roper Engineering, dated 4/13/11, discusses replacement of 3 culverts. The replacement of the 15" culvert will need to be addressed as part of this application. Approval of a "Riparian Exception" is required prior to removal and replacement. NOTE: Submit the biotic assessment from Bryan Mori regarding Santa Cruz long-toed salamander upon making application for the "Riparian Exception" (refer to letter from John Gilchrist, dated 2/23/10 and revised 6/28/10). ADDITIONAL NOTE: Should other county

Environmental Planning

Routing No: 2 | Review Date: 05/10/2011
ROBERT LOVELAND (RLOVELAND) : Incomplete

departments require the additional culverts to be replaced, now or in the future, than a "Riparian Exception" and biotic assessment covering those areas would be required too.
CONDITIONS OF APPROVAL:
1. Submit "Plan Review Letters" from the project geotechnical engineer and geologist prior to building permit issuance.
2. Submit a grading and drainage plan completed by a licensed civil engineer for review and approval upon building permit submittal.
3. Submit an erosion/sediment control plan for review and approval upon building permit submittal.
4. A "Biotic Declaration of Restriction" describing the identified "Sensitive Habitat" and Monterey spineflower and how it will be protected shall be recorded with the county Recorder's Office prior to parcel map recordation.

SAMANTHA HASCHERT (SHASCHERT) : Incomplete

incomplete for signage and ripex fee (culvert replacement on parcel A)

Routing No: 5 | Review Date: 02/29/2012
ROBIN BOLSTER (RBOLSTER) : Complete

Road Engineering Review

Routing No: 1 | Review Date: 03/02/2010
RODOLFO RIVAS (RRIVAS) : Complete

DPW ROAD ENGINEERING ==== REVIEW ON FEBRUARY 25, 2010 BY RODOLFO N RIVAS
1)Big tree Lane at the intersection with Larkin
Valley Road should be improved to a road width of 24 feet for a distance of 50 feet in order accommodate simultaneous vehicular ingress and egress.

2)All driveways for this development are
required to comply with minimum requirements regarding structural section as prescribed by the County of Santa Cruz Design Criteria.
========= UPDATED ON MARCH 2, 2010 BY
RODOLFO N RIVAS ========= MISCELLANEOUS COMMENT: ========= REVIEW ON MARCH 2, 2010 BY RODOLFO N RIVAS =========

Road Engineering Review

Routing No: 2 | Review Date: 05/11/2011
RODOLFO RIVAS (RRIVAS) : Complete

Permit Conditions and Additional Information:

1) It is recommended that Big Tree Lane be used as the only vehicular access to parcel "A" and to parcel "B" in order to reduce the number of vehicular conflicts generated by turning movement at two separate access points on Larkin Valley Road. Therefore, the existing driveway serving parcel "A" will need to be removed.

Routing No: 3 | Review Date: 08/31/2011
SAMANTHA HASCHERT (SHASCHERT) : Incomplete

[Planner's notes: reroute to DPW roads for slope and surfacing requirements.SH]

Permit Conditions and Additional Information:

Please refer to previous comments regarding recommendation to access both parcels via Big Tree Lane.

Routing No: 4 | Review Date: 11/21/2011
SAMANTHA HASCHERT (SHASCHERT) : Complete

(Planner comments: revised plans indicate that driveway slope is less than 15% and does not require paving. Conditions will require access to Parcel A from Big Tree with any future site improvements.)

ATTACHMENT 9

6. Tentative Parcel Map and Tentative Improvement Plans must be two separate sheets. Show all improvements to be completed with this minor land division on a separate plan sheet.
7. Exposed base rock surface for driveway is unacceptable and does not meet Department Design Criteria requirements. Revise plans to indicate an all weather surface.
8. Provide bearings and distances for all parcel lines and easements to be created with this map.

Surveyor Review

Routing No: 3 | Review Date: 08/30/2011
SAMANTHA HASCHERT (SHASCHERT) : Complete

(Planner's notes below each item. Applicant has fulfilled requested submittal requirements. -SH)
1. Provide verification that the right to use the 40' private right-of-way of Big Tree Lane has been granted by adjacent property owners. (submitted)
2. Remove existing structures and proposed structures from Tentative Parcel map. This document is for creating parcel lines, dedication parcels, existing incumbrances (easements, rights-of-way, etc.) and easements only. (Condition of approval)
3. Show all existing easements for road and water line purposes as shown on Vol 9 PM page (N/A) 4. These easements must be abandoned if they are no longer needed. (N/A incorrect map)
4. Exposed base rock surface for driveway is unacceptable and does not meet Department Design Criteria requirements. Revise plans to indicate an all weather surface.(Refer to roads for slope requirements)
5. Provide bearings and distances for all easements to be created with this map.(COA)
6. Where is culvert plan A/T2 on sheet T2 plan? Please add section call out to plan. (Completeness)

Routing No: 4 | Review Date: 11/21/2011
SAMANTHA HASCHERT (SHASCHERT) : Not Required

State/US Review

Routing No: 1 | Review Date: 09/01/2011
SAMANTHA HASCHERT (SHASCHERT) : No Response

:Review Type= FISH AND GAME NO PROJECT REVIEW DESCRIPTION AVAILABLE

ATTACHMENT 9

Roper Engineering
Civil Engineering & Land Surveying
64 Penny Lane, Suite A - Watsonville, CA 95076-6021
(831) 724-5300 phone
(831) 724-5509 fax
jeff@roperengineering.com e-mail

Jeff A. Roper
Civil Engineer & Land Surveyor
RCE 41081
PLS 5180

Nathan Lewis
711 Larkin Valley Road
Watsonville, Ca 95076

April 13, 2011

Re: Drainage investigation for Lewis MLD at 711 Larkin Valley Road, Watsonville
Our Job No. 08020, APN 049-121-23, Co. App No. 10-0030

Dear Mr. Lewis,

Based upon the request of Santa Cruz County Public Works Drainage Department, we have performed a drainage analysis of the three culverts listed in their Incomplete Application Letter dated March 5, 2010, Item 4. Sheet 2 shows the drainage areas that flow through each of the culverts. Sheet 3 shows computations for the expected 10 year flow rates at each of the culverts. Sheets 4 through 9 show the performance of the existing culverts and proposed upgraded culverts.

Based upon our calculations, drainage at all of the existing culverts will overtop their respective roads during a 10 year storm event. We have computed the replacement size culverts that would be needed to keep the drainage from overtopping the roads. The existing 15" culvert will need to be replaced with two 24" HDPE Type S culverts. The two 12" culverts along Larkin Valley Road will need to be replaced with two 15" HDPE Type S culverts.

Please give me a call if you have further questions.

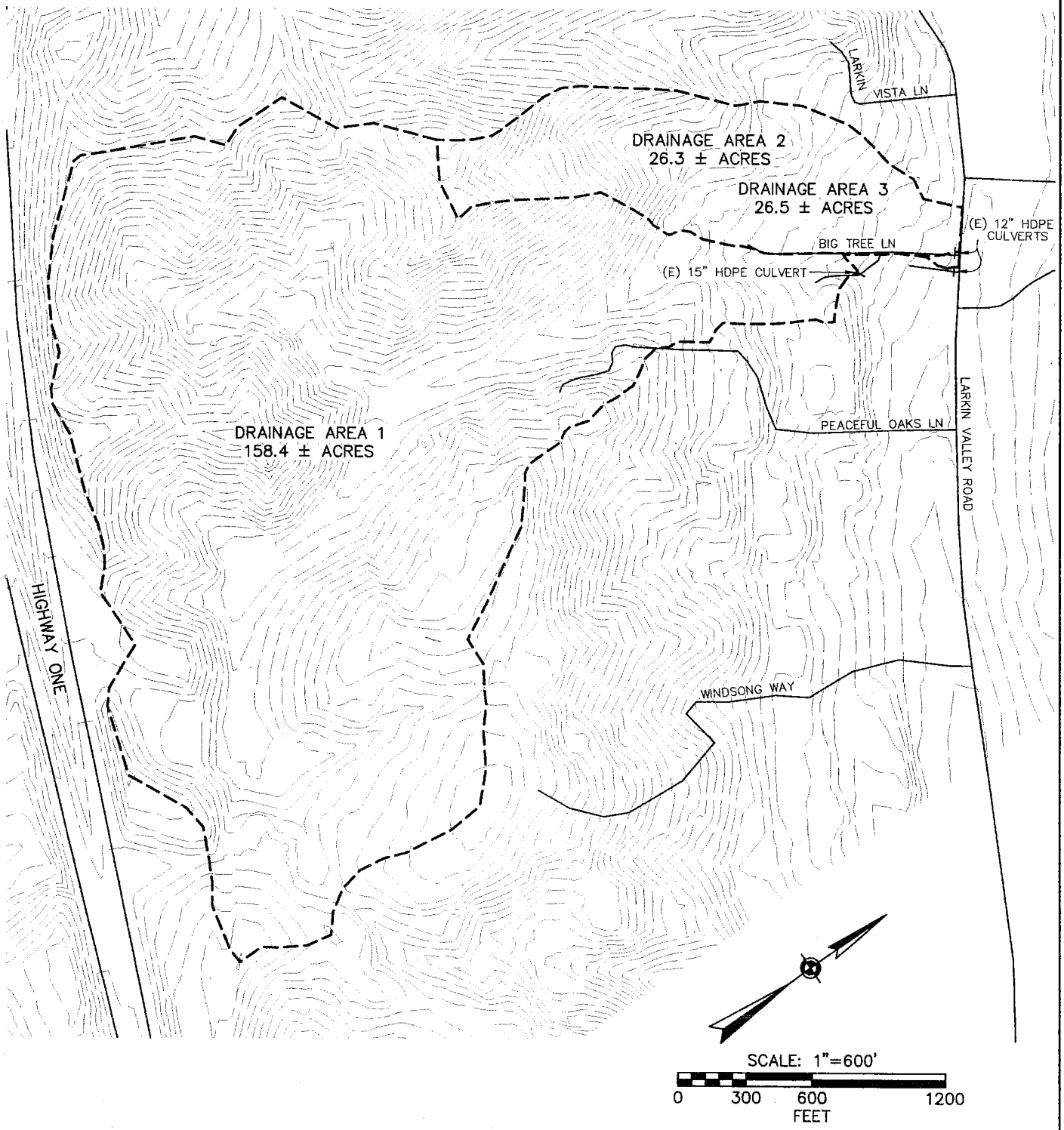
Respectfully submitted,

Jeff Roper

REGISTERED PROFESSIONAL ENGINEER
JEFF A. ROPER
No. 41081
Renewal: 3-31-13
CIVIL
STATE OF CALIFORNIA

ATTACHMENT 10

CLIENT: NATHAN LEWIS	**ROPER ENGINEERING** CIVIL ENGINEERING & LAND SURVEYING 64 PENNY LANE, SUITE A WATSONVILLE, CA 95076 (831) 724-5300	JOB NO.: 08020
LOCATION: 711 LARKIN VALLEY RD		DATE: MAR. 12, 2011
DRAINAGE CALCULATIONS		SHEET: SHEET 2 OF 9



ATTACHMENT 10

Project: Nathan Lewis

Sheet No.: 3 of 9
Job No.: 08020
Date: 4/13/2011

Roper Engineering
64 Penny Lane, Suite A
Watsonville, CA 95076 (831) 724-5300

Location: 711 Larkin Valley Road

DRAINAGE CALCULATIONS

Reference: "County of Santa Cruz Design Criteria"

Design Criteria: Rational Method, Q = Ca C i A

Recurrence Interval =	10	years	
Recurrence interval factor Ca =	1.0	10 year	(Fig SWM-1)
ia=	1.0	10 year	(Fig SWM-1)
P60 Isopleth =	1.3	inches/hour	(Fig SWM-2)
Runoff coefficient C =	0.20	rural	(Fig SWM-1)

15" HDPE Culvert at private driveway

Concentration time t=	20	minutes	(Fig SWM-4)
Rainfall intensity I=	1.4	inches/hour	(Fig SWM-3)
Watershed Area =	158.4	acres	measured

Runoff Q = Ca ia C i A= **44.4 cfs**

12" HDPE Culvert at Big Tree Lane

Concentration time t=	10	minutes	(Fig SWM-4)
Rainfall intensity I=	1.9	inches/hour	(Fig SWM-3)
Watershed Area =	26.3	acres	measured

Runoff Q = Ca ia C i A= **10.0 cfs**

12" HDPE Culvert at private driveway

Concentration time t=	10	minutes	(Fig SWM-4)
Rainfall intensity I=	1.9	inches/hour	(Fig SWM-3)
Watershed Area =	26.5	acres	measured

Runoff Q = Ca ia C i A= **10.1 cfs**

ATTACHMENT 10

Culvert Calculator Report
15" HDPE existing

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	183.30	ft	Headwater Depth/Height	50.52	
Computed Headwater Elev	242.88	ft	Discharge	47.50	cfs
Inlet Control HW Elev.	217.14	ft	Tailwater Elevation	179.00	ft
Outlet Control HW Elev.	242.88	ft	Control Type	Outlet Control	

Grades					
Upstream Invert	179.73	ft	Downstream Invert	177.77	ft
Length	34.65	ft	Constructed Slope	0.056566	ft/ft

Hydraulic Profile					
Profile	PressureProfile		Depth, Downstream	1.25	ft
Slope Type	N/A		Normal Depth	N/A	ft
Flow Regime	N/A		Critical Depth	1.25	ft
Velocity Downstream	38.71	ft/s	Critical Slope	1.036706	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.018	
Section Material	HDPE Smooth (Corrugated Interior)		Span	1.25	ft
Section Size	15 inch		Rise	1.25	ft
Number Sections	1				

Corrugated HDPE 15 inch

Outlet Control Properties					
Outlet Control HW Elev.	242.88	ft	Upstream Velocity Head	23.28	ft
Ke	0.20		Entrance Loss	4.66	ft

Inlet Control Properties					
Inlet Control HW Elev.	217.14	ft	Flow Control	Submerged	
Inlet Type	Beveled ring, 33.7° bevels		Area Full	1.2	ft²
K	0.00180		HDS 5 Chart	3	
M	2.50000		HDS 5 Scale	B	
C	0.02430		Equation Form	1	
Y	0.83000				

ATTACHMENT 10

Culvert Calculator Report
2-24" HDPE proposed

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	183.30	ft	Headwater Depth/Height	1.50	
Computed Headwater Elev	182.72	ft	Discharge	47.50	cfs
Inlet Control HW Elev.	182.72	ft	Tailwater Elevation	179.00	ft
Outlet Control HW Elev.	182.72	ft	Control Type	Inlet Control	

Grades					
Upstream Invert	179.73	ft	Downstream Invert	177.77	ft
Length	34.65	ft	Constructed Slope	0.056566	ft/ft

Hydraulic Profile					
Profile	S2		Depth, Downstream	1.08	ft
Slope Type	Steep		Normal Depth	0.89	ft
Flow Regime	Supercritical		Critical Depth	1.73	ft
Velocity Downstream	13.79	ft/s	Critical Slope	0.008642	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.012	
Section Material	HDPE (Smooth Interior)		Span	2.00	ft
Section Size	24 inch		Rise	2.00	ft
Number Sections	2				

Outlet Control Properties					
Outlet Control HW Elev.	182.72	ft	Upstream Velocity Head	1.05	ft
Ke	0.20		Entrance Loss	0.21	ft

Inlet Control Properties					
Inlet Control HW Elev.	182.72	ft	Flow Control	Submerged	
Inlet Type	Beveled ring, 33.7° bevels		Area Full	6.3	ft²
K	0.00180		HDS 5 Chart	3	
M	2.50000		HDS 5 Scale	B	
C	0.02430		Equation Form	1	
Y	0.83000				

ATTACHMENT 10

Culvert Calculator Report
12" HDPE Big Tree Lane existing

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	154.50	ft	Headwater Depth/Height	10.50	
Computed Headwater Elev	163.19	ft	Discharge	10.00	cfs
Inlet Control HW Elev.	157.45	ft	Tailwater Elevation	153.20	ft
Outlet Control HW Elev.	163.19	ft	Control Type	Outlet Control	

Grades					
Upstream Invert	152.69	ft	Downstream Invert	152.22	ft
Length	46.00	ft	Constructed Slope	0.010217	ft/ft

Hydraulic Profile					
Profile	CompositeM2PressureProfile		Depth, Downstream	0.99	ft
Slope Type	Mild		Normal Depth	N/A	ft
Flow Regime	Subcritical		Critical Depth	0.99	ft
Velocity Downstream	12.74	ft/s	Critical Slope	0.141497	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.018	
Section Material	HDPE Smooth Interior (Corrugated Exterior)		Span	1.00	ft
Section Size	12 inch		Rise	1.00	ft
Number Sections	1				

CorrugatedSection Material

Outlet Control Properties					
Outlet Control HW Elev.	163.19	ft	Upstream Velocity Head	2.52	ft
Ke	0.20		Entrance Loss	0.50	ft

Inlet Control Properties					
Inlet Control HW Elev.	157.45	ft	Flow Control	Submerged	
Inlet Type	Beveled ring, 33.7° bevels		Area Full	0.8	ft²
K	0.00180		HDS 5 Chart	3	
M	2.50000		HDS 5 Scale	B	
C	0.02430		Equation Form	1	
Y	0.83000				

ATTACHMENT 10

Culvert Calculator Report
2-15" HDPE Big Tree Lane proposed

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	154.50	ft	Headwater Depth/Height	1.14	
Computed Headwater Elev	154.11	ft	Discharge	10.00	cfs
Inlet Control HW Elev.	154.08	ft	Tailwater Elevation	153.20	ft
Outlet Control HW Elev.	154.11	ft	Control Type	Entrance Control	

Grades					
Upstream Invert	152.69	ft	Downstream Invert	152.22	ft
Length	46.00	ft	Constructed Slope	0.010217	ft/ft

Hydraulic Profile					
Profile	CompositeS1S2		Depth, Downstream	0.98	ft
Slope Type	Steep		Normal Depth	0.78	ft
Flow Regime	N/A		Critical Depth	0.91	ft
Velocity Downstream	4.84	ft/s	Critical Slope	0.006651	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.012	
Section Material	HDPE (Smooth Interior)		Span	1.25	ft
Section Size	15 inch		Rise	1.25	ft
Number Sections	2				

Outlet Control Properties					
Outlet Control HW Elev.	154.11	ft	Upstream Velocity Head	0.43	ft
Ke	0.20		Entrance Loss	0.09	ft

Inlet Control Properties					
Inlet Control HW Elev.	154.08	ft	Flow Control	Transition	
Inlet Type	Beveled ring, 33.7° bevels		Area Full	2.5	ft²
K	0.00180		HDS 5 Chart	3	
M	2.50000		HDS 5 Scale	B	
C	0.02430		Equation Form	1	
Y	0.83000				

ATTACHMENT 10

Culvert Calculator Report
12" HDPE private driveway existing

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	153.50	ft	Headwater Depth/Height	9.57	
Computed Headwater Elev	161.31	ft	Discharge	10.10	cfs
Inlet Control HW Elev.	156.58	ft	Tailwater Elevation	152.00	ft
Outlet Control HW Elev.	161.31	ft	Control Type	Outlet Control	

Grades					
Upstream Invert	151.74	ft	Downstream Invert	151.06	ft
Length	40.00	ft	Constructed Slope	0.017000	ft/ft

Hydraulic Profile					
Profile	CompositeM2PressureProfile		Depth, Downstream	0.99	ft
Slope Type	Mild		Normal Depth	N/A	ft
Flow Regime	Subcritical		Critical Depth	0.99	ft
Velocity Downstream	12.87	ft/s	Critical Slope	0.144517	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.018	
Section Material	Corrugated HDPE (Corrugated Interior)		Span	1.00	ft
Section Size	12 inch		Rise	1.00	ft
Number Sections	1				

Outlet Control Properties					
Outlet Control HW Elev.	161.31	ft	Upstream Velocity Head	2.57	ft
Ke	0.20		Entrance Loss	0.51	ft

Inlet Control Properties					
Inlet Control HW Elev.	156.58	ft	Flow Control	Submerged	
Inlet Type	Beveled ring, 33.7° bevels		Area Full	0.8	ft²
K	0.00180		HDS 5 Chart	3	
M	2.50000		HDS 5 Scale	B	
C	0.02430		Equation Form	1	
Y	0.83000				

ATTACHMENT 10

Culvert Calculator Report
2-15" HDPE private driveway proposed

Solve For: Headwater Elevation

Culvert Summary					
Allowable HW Elevation	153.50	ft	Headwater Depth/Height	1.14	
Computed Headwater Elev	153.17	ft	Discharge	10.10	cfs
Inlet Control HW Elev.	153.14	ft	Tailwater Elevation	152.00	ft
Outlet Control HW Elev.	153.17	ft	Control Type	Entrance Control	

Grades					
Upstream Invert	151.74	ft	Downstream Invert	151.06	ft
Length	40.00	ft	Constructed Slope	0.017000	ft/ft

Hydraulic Profile					
Profile	CompositeS1S2		Depth, Downstream	0.94	ft
Slope Type	Steep		Normal Depth	0.66	ft
Flow Regime	N/A		Critical Depth	0.91	ft
Velocity Downstream	5.10	ft/s	Critical Slope	0.006702	ft/ft

Section					
Section Shape	Circular		Mannings Coefficient	0.012	
Section Material	HDPE (Smooth Interior)		Span	1.25	ft
Section Size	15 inch		Rise	1.25	ft
Number Sections	2				

Outlet Control Properties					
Outlet Control HW Elev.	153.17	ft	Upstream Velocity Head	0.43	ft
Ke	0.20		Entrance Loss	0.09	ft

Inlet Control Properties					
Inlet Control HW Elev.	153.14	ft	Flow Control	Transition	
Inlet Type	Beveled ring, 33.7° bevels		Area Full	2.5	ft²
K	0.00180		HDS 5 Chart	3	
M	2.50000		HDS 5 Scale	B	
C	0.02430		Equation Form	1	
Y	0.83000				

ATTACHMENT 11

February 23, 2010 (Revised 6/28/10)

Mr. Nathan Lewis
711 Larkin Valley Road
Watsonville, CA 95076

RE: Biotic Review for Land Division at 711 Larkin Valley Road
APN 049-121-23

Dear Mr. Lewis:

The following letter report provides a review of previous biotic reports and current site biologic conditions (vegetation) for your proposed 3-lot land division at 711 Larkin Valley Road. This review was conducted at the request of Mr. Stephen Graves in conjunction with recent revisions made to the proposed Tentative Parcel Map for your land division.

Methods

John Gilchrist conducted a site field review on January 25, 2010, and with Mr. Lewis and Mr. Graves on 5/21/10. I also reviewed the existing botanical assessment and assessment revisions by Albion Environmental, Inc. dated 6/7/04, 8/12/04 and 8/22/05. The Santa Cruz County General Plan (1994) and GIS biologic mapping were examined. A County Planning biotic review letter (undated), and a County incomplete application letter (3/5/10) were reviewed, as were three proposed Tentative Maps, dated 6/22/08, 2/1/10 and 4/7/10 prepared by Mid Coast Engineers. Finally the California Natural Diversity Data Base (Rare Find) and the Bryan Mori report on Santa Cruz long-toed salamander (8/5/04) were reviewed, although the latter report is not addressed in this evaluation. It is my understanding that Bryan Mori will address Santa Cruz long-toed salamander issues in a separate document. Further amendments to the Tentative Map have been made to address County concerns regarding the riparian corridor and existence/ location of the San Andreas Oak Woodland. Recent tentative map changes were made to the Parcel C building site (See attached Figure 1).

Environmental Setting—Vegetation

My site visits reaffirmed the plant community descriptions indicated in the three Albion Environmental botanic assessments and the revised vegetation (plant community) mapping appended to the 8/22/05 Albion report. The 8/22/05 map (see attached Figure 2) shows a large area of California annual grassland, a non-riparian arroyo willow community and a planted Douglas fir forest on or in the immediate vicinity of Development Envelope B. Development Envelope C is characterized by an annual grassland community to the north and transitional San Andreas Oak Woodland (SAOW) community. The transitional SAOW continues to the south where it merges into a true

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226 Spring Street
Santa Cruz CA 95060
jga@cruzio.com

ATTACHMENT 11

San Andreas Oak Woodland community. Riparian arroyo willow, annual grassland and a blue gum eucalyptus community are also found in the southerly part of proposed Parcel C. The mapped "special forest" designation for SAOW includes about ½ of the San Andreas Oak Woodland found on the parcel.

Findings

The San Andreas Oak Woodland is considered a sensitive habitat in the County General Plan. The transitional SAOW on this site shows some evidence of previous disturbance (see attached photo showing historical agricultural uses) and does not contain the diversity of native plant species (trees, shrubs and herbaceous) that is normally present in the SAOW. Species found in the immediate vicinity of Parcel C building envelope were primarily coast live oak (*Quercus agrifolia*) with some scattered poison oak (*Toxicodendron diversilobum*), hedgenettle (*Stachys bullata*), California blackberry (*Rubus ursinus*) and non-native California annual grassland species. Other native species normally found in SAOW were absent in this area. No Hooker's manzanita (*Arctostaphylos hookeri* spp. *hookeri)* was found anywhere on the site. With the absence of a diverse assemblage of native species, the transitional SAOW on this site would not be considered a true sensitive habitat with significant biotic resource value as defined in the County General Plan.

No rare, threatened or endangered plant species were identified during the site visit. It should be noted that the timing of the more extensive plant survey (1/25/10) would preclude identification of many annual spring or summer blooming species. The 5/21/10 survey was focused on the building sites and access roads, but no sensitive plant species were identified in that survey. Because the earlier botanical survey (Albion Environmental, 6/7/04) was conducted during the flowering period of most annual species, and none were found in that survey, and the May 2010 survey identified no sensitive plants in impact areas, follow-up surveys are not recommended. The summer-flowering Santa Cruz tarplant (*Holocarpa macradenia*) would not be expected on this site. Neither of the special status manzanita species, *Arctostaphylos hookeri* spp. *hookeri* or *Arctostaphylos pajaroensis* that are present in south Santa Cruz county areas was identified on this site. We concur with the existing site vegetation map prepared by Albion Environmental dated 8/22/05 (attached).

Recommendations

1. The new development envelope for Parcel C includes an area of non-native California annual grassland to the north and transitional San Andreas Oak Woodland to the south and east. The transitional SAOW is not considered a significant biotic resource because it has experienced past disturbance, doesn't have the normal plant diversity of SAOW and contains a non-native grassland component. While this development site does not encroach on the intact San Andreas Oak Woodland community to the south, some oak trees may have to be removed for construction of the home and any out-buildings. Therefore the recommendation in the Albion Environmental report (6/7/04) to avoid oak tree removal insofar as possible, and replant mature and

immature coast live oaks at 3:1 and 2:1 ratio, respectively, would still apply. A new Parcel C development envelope configuration, dated 6/24/10, reduces the size of the proposed building envelope to avoid oak trees. Nine coast live oaks, ranging in size from 5 to 12 inches DBH will be avoided by the new configuration. Eleven oaks remain within the building envelope.

Oaks can be replanted on other locations within Parcel C for mitigation. However, a preferred enhancement alternative would be to remove an area of eucalyptus along the west property line (see Figure 2) and revegetate with requisite number of oaks (minimum of 33) coupled with native understory species. An understory species list can be provided. This would provide restoration of an area with an approximate size of 2000 square feet (20' x 100'), degraded with an invasive species that has significantly impacted the area and will eventually remove adjacent San Andreas Oak Woodland forest. An access road exists to this area minimizing potential disturbance. Mr. Lewis, long time owner of a tree service, is familiar with eucalyptus removal and treatment techniques and has equipment to minimize impacts to nearby native tree and understory species. Removal of eucalyptus in this area would have the added benefit of eliminating the encroachment of an invasive species into a riparian corridor.

2. Building site B is in an area of disturbed non-native annual grassland and it appears oak tree removal can be avoided. No additional recommendations are required.

3. Remove invasive species and control trespass into Parcel C, as recommended in the Planning Department biotic review letter. Landscape plans for both parcels should include native species, particularly those species found in and adapted to the San Andreas Oak Woodland community.

I trust this answers issues brought up in previous reports and revised plans. Please don't hesitate to contact me if you have any questions.

Sincerely,

John Gilchrist
Resource Ecologist

cc: Stephen Graves, Stephen Graves and Associates

ATTACHMENT 11

GRAPHICS AND AERIAL PHOTO

ATTACHMENT 11

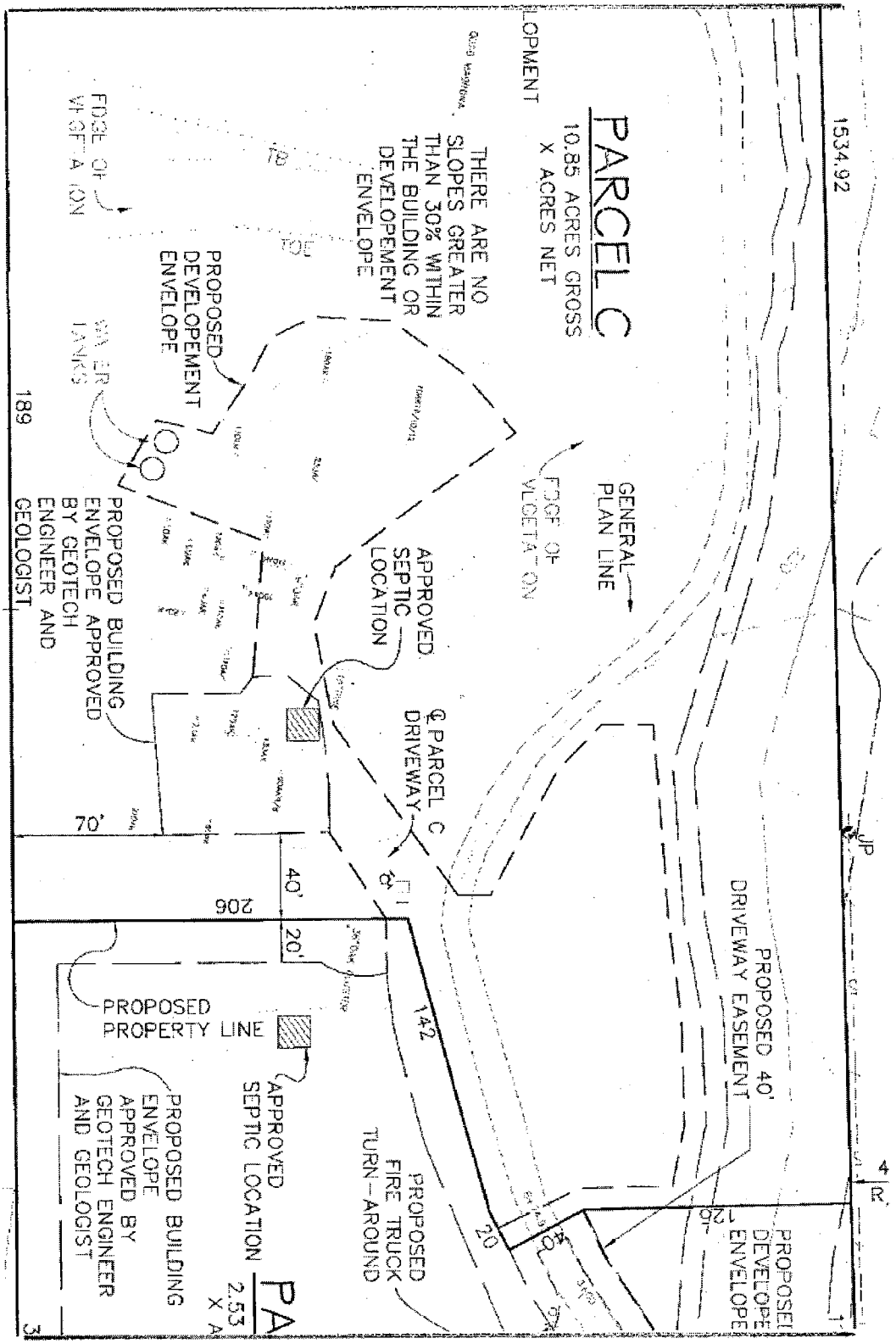
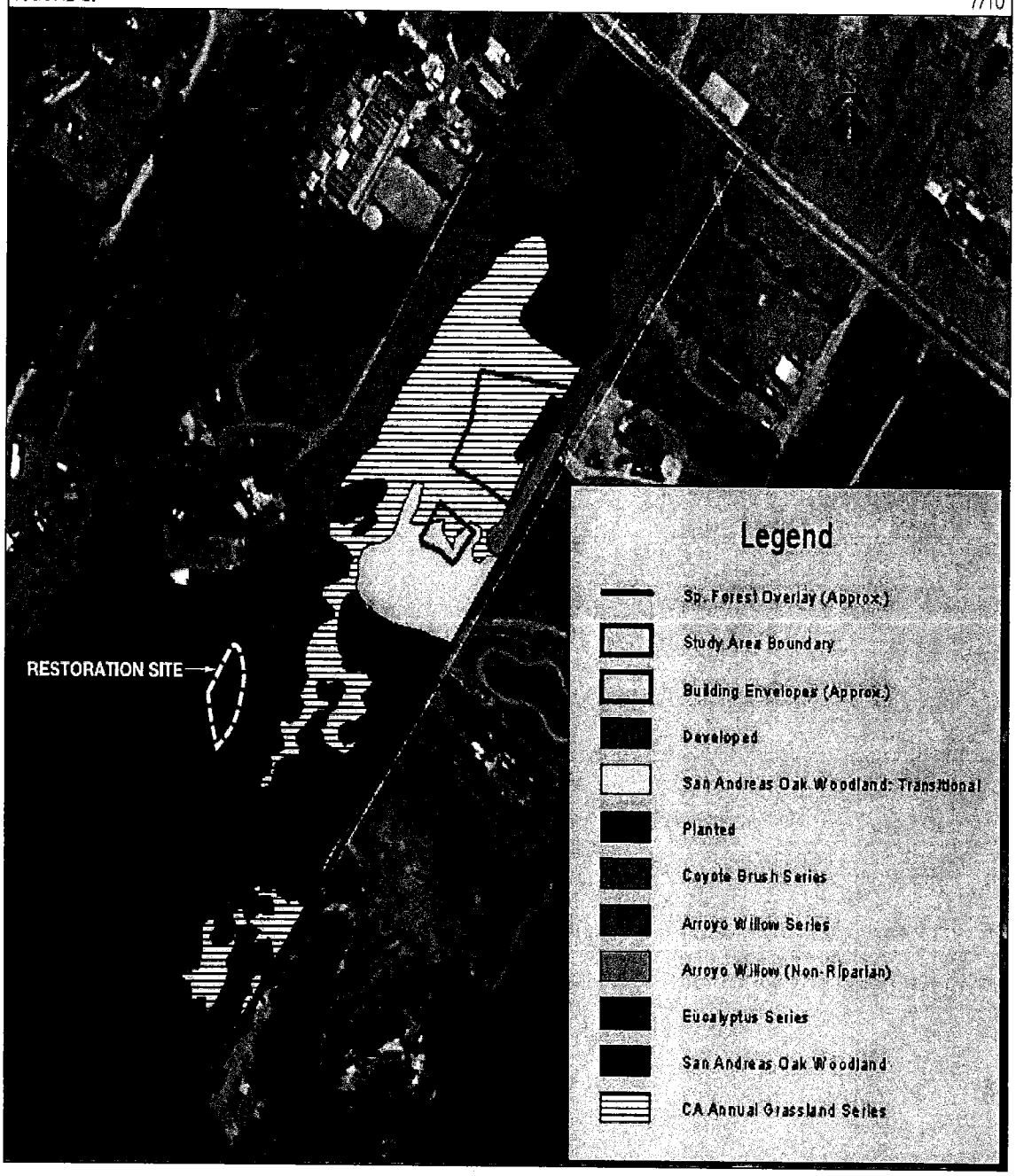


FIGURE 1. BUILDING & DEVELOPMENT ENVELOPE
PARCEL C - Prepared by MID-COAST ENGINEERS
6-24-10

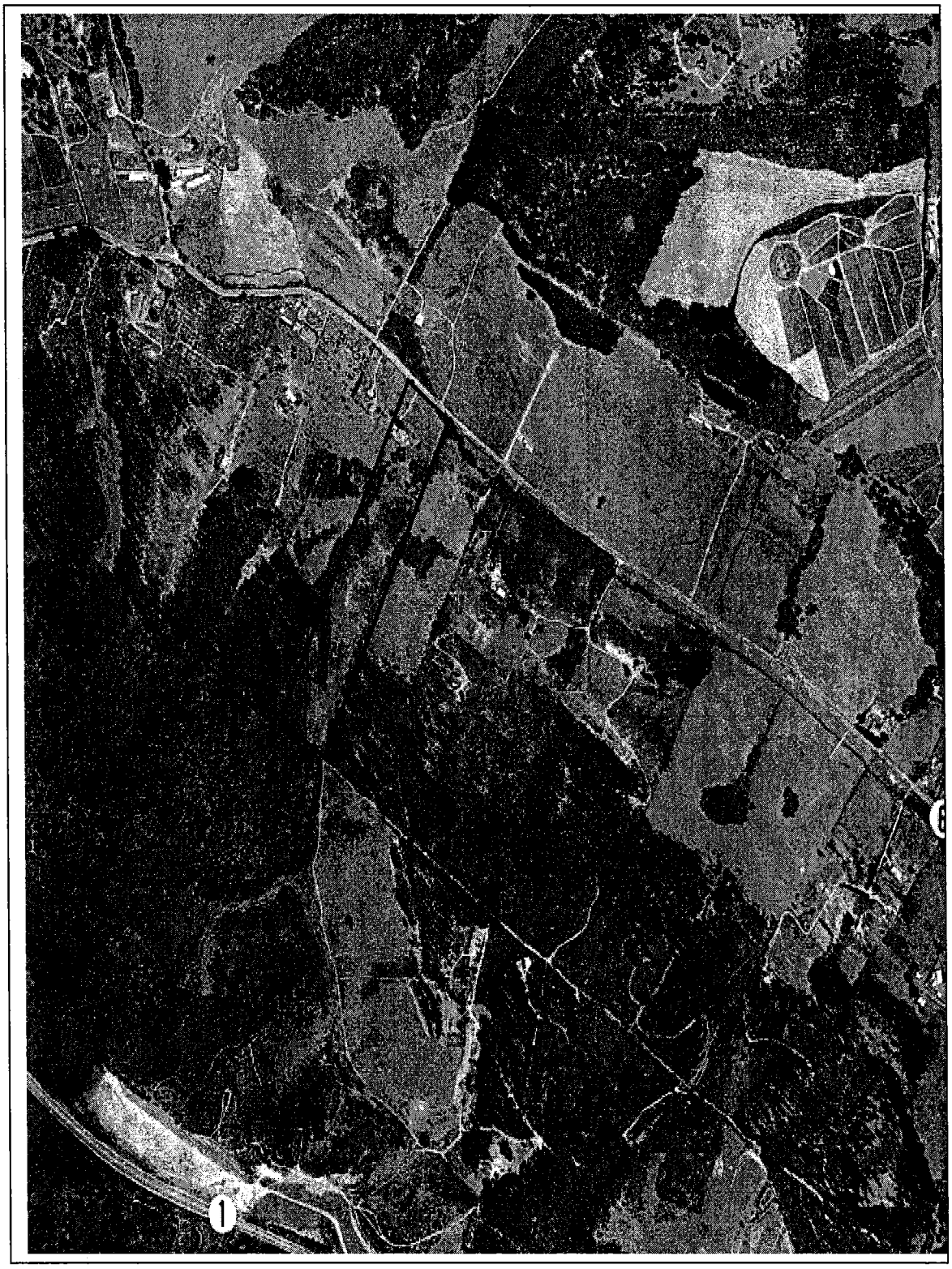
ATTACHMENT 11

FIGURE 2. 7/10



Adapted from Albion Environmental Vegetation Map (Appendix A – 8/22/05)

ATTACHMENT 11



1972 Aerial Photo showing orchards or grazing over much of Larkin Valley including project site.

ECOSYSTEMS WEST
CONSULTING GROUP

September 1, 2010

Matt Johnston
Planning Department
County of Santa Cruz
701 Ocean Street
Santa Cruz, CA 95060

Re: Biological Review of the John Gilchrist & Associates Biotic Letter Report for the Lewis Property located at 711 Larkin Valley Road (APN 049-121-23)

Dear Matt:

This letter summarizes my review of the "Biotic Review Letter Report" prepared by John Gilchrist & Associates Environmental Consultants dated February 23, 2010 (Revised June 28, 2010) for Stephen Graves representing Nathan Lewis entitled "Biotic Review for Land Division at 711 Larkin Valley Road APN 049-121-23". The intent of this document was to provide a review of the previous biotic reports prepared for this property and to assess current vegetation conditions in the areas proposed for a three lot land division. The main focus of this reassessment was to address concerns raised by the County of Santa Cruz Planning Department regarding the riparian corridor and existence/location of San Andreas Oak Woodland on the current undivided 17.6-acre parcel.

Mr. Gilchrist conducted a site visit on January 25, 2010 to review the previous community characterizations and mapping. The timing of this survey would not have been appropriate to identify special-status annual plant species known to occur in the vicinity of the parcel. On page 2 paragraph three he notes that he revisited the parcel on May 21, 2010 and focused his survey on the proposed building sites B and C and the access roads. During the course of this survey he again stated that no special-status plants were observed. He also reconfirms that previous surveys conducted by the Albion botanist in 2004 and 2005 would have been at the appropriate phonological period to identify those species if present. In addition to the field visit in January, Mr. Gilchrist reviewed the County GIS mapping and a 1972 aerial photo (source unknown) of the Larkin Valley including the subject parcel. Mr. Gilchrist findings generally reiterate those of Albion's, that in particular the open oak woodland in the building area C is transitional to the San Andreas Oak Woodland community on the south portion of the parcel as mapped by Albion and appended to the letter report. The main justification for this determination continues to be based on the lack of a diverse understory of native plant species and dominance in the understory of California annual grass species. Therefore, he concludes that the transitional San Andreas Oak Woodland on the site as portrayed on the Albion map "would not be considered a true sensitive habitat with significant biotic resource value as defined in the County General Plan."

A field visit was conducted by Matt Johnston, Deputy Environmental Coordinator and Bill Davilla in early August 2010. It was again apparent during the course of our field visit that the oak woodland on the parcel in the area proposed for building envelope C had been previously thinned and the understory vegetation removed or chained with the ground cover periodically mowed. Several of the native shrub species including California coffeeberry, poison oak and coyote brush were regrowing from remaining root balls and cut stems. The oak woodland just to the east and bordering the open oak woodland has the dense thicket understory composed of native shrub and vine species. The soils on the parcel are mapped primarily as baywood loamy sands, 30 to 50 percent slopes surrounded by Elkhorn-Pfeiffer complex, 30 to 50 percent slopes in the Soil Survey of Santa Cruz County. The baywood loamy soil type supports special-status plant species know to occur in the southern Santa Cruz County area (i.e., Hooker's manzanita and Monterey spineflower) and demarcates the sensitive San Andreas oak woodland habitat.

In addition to our observations of this current structure of the habitat, we also observed a patch of Monterey spineflower (*Chorizanthe pungens* ssp. *pungens*) at the northern end of the oak woodland in proposed building envelope C, just on the edge of the existing dirt access road to the south end of the parcel. Monterey spineflower is low growing annual herb that is found on the sandy terrace baywood loamy sand substrates found on the parcel and is listed as threatened by the U.S. Fish and Wildlife Service and is a list 1B by the California Native Plant Society. This species is often found on recently disturbed substrates or in openings of San Andreas oak woodland and may not be present in consecutive years.

As I stated in my review letter dated September 21, 2004, I continue to believe the best indicator for the San Andreas Oak woodland habitat is the association with the baywood loamy sands that occur from south of Highway one to Freedom Road on the north. San Andreas woodland is found on both sides of the ridgeline that separates Larkin Valley from Highway 1 and on the ridgeline that separates Larkin Valley from Freedom Road. In all cases the oak woodland supports a similar mesic understory of evergreen shrubs primarily California coffeeberry, poison oak, brittle-leaved manzanita, California hazelnut, and blue blossom and mesic herbs and vine species. The woodland on the parcel probably supported a similar understory composition and structure prior to the clearing circa 2000. Therefore, the oak woodland habitat including the "transition SAOW" on the parcel should continue to be recognized as San Andreas Live Oak Woodland and thus a "Special Forest" under the General Plan.

Should you require further clarification of this review, please don't hesitate to contact me.

Sincerely,

Bill Davilla
Principal

COUNTY OF SANTA CRUZ

PLANNING DEPARTMENT

701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123
KATHLEEN MOLLOY PREVISICH, PLANNING DIRECTOR

September 2, 2010

Stephen Graves Associates
2735 Porter Street
Soquel, CA 95073

APN: 049-121-23
Situs: 711 Larkin Valley Road
App #: 10-0030

Dear Mr. Graves:

The review of your "Biotic Review Letter Report" prepared by John Gilchrist & Associates Environmental Consultants, dated February 23, 2010 (Revised June 28, 2010) has been completed. A copy of the review letter from our consultant is attached for your reference.

In early August 2010, I conducted a site visit with Bill Davilla, consulting biologist with the County Planning Department, to review the determinations made in the above-cited report. During that visit, Mr. Davilla identified a large patch of Monterey spineflower (*Chorizanthe pungens* ssp. *pungens*) in the area identified as the building envelope for parcel C. This occurrence was photo-documented at the time of our visit. The Monterey spineflower is listed by the US Fish and Wildlife Service (USFWS) as a threatened species and by the California Native Plant Society a list 1B species. County code section 16.32.040 defines sensitive habitat as:

> "Areas which provide habitat for rare, endangered or threatened species as designated by the State Fish and Game Commission, United States Fish and Wildlife Service or California Native Plant Society."

In addition to the occurrence of this special status species, we identified new growth in the area of the young oak trees that lacks an understory, of native plants typically associated with oak woodland understory, including California coffee berry and poison oak. In his letter, Mr. Davilla emphasizes the correlation between the baywood sandy loam soil type that is mapped and present on this parcel, and the presence of special-status species such as the Monterey spineflower and San Andreas oak woodland.

It is the determination of the Planning Department that the area identified as the building envelope for parcel C, above the single large oak tree adjacent to the bike track, up to and including the stand of small oak trees bordered to the south and east by established oak

ATTACHMENT 13

woodland, is considered sensitive habitat as defined by the County code section cited above. The area around the track was surveyed at the time of our visit and spineflower was not found to be present. This indicates a change in the soil type from the baywood sandy loams to the Elkhorn Pfeiffer complex. From a biotic constraints perspective, there are no biotic resources evident that would preclude the establishment of a second lot identified as parcel B in your proposal. However, a third lot in the location proposed for parcel C would result in the eradication of a federally listed species and would not be in conformance with section 5.1.5 (Land Division and Density Requirements in Sensitive Habitats) of the General Plan in that it would not be compatible with the protection of sensitive resources.

In light of the new finding of the Monterey spineflower in the proposed building envelope, the submitted report as written cannot be accepted. You may continue to pursue a third parcel in this application for a minor land division against the recommendations of the Planning Department, or you may amend your application to avoid the San Andreas oak woodland and Monterey spineflower habitats, either by reducing the number of proposed lots to two or reconfiguring the lots to avoid impacts to sensitive habitat. However you choose to proceed, you will need to have Mr. Gilchrist update his letter report to include the Monterey spineflower finding. Please note that avoidance of sensitive habitat in itself does not imply approval of a land division, as other constraints not evaluated in this review may apply.

Please call me at 831-454-3201 if you have any questions regarding this letter.

Sincerely,

Matthew Johnston
Environmental Planning

Cc: Nathan Lewis
John Gilchrist
Samantha Haschert
Bob Loveland

ATTACHMENT 1

HABITAT MANAGEMENT PLAN

Nathan Lewis Property, 711 Larkin Valley Road, APN 049-121-23
June 28, 2011

Introduction

The following habitat management plan (plan) describes existing vegetation conditions of the Transitional San Andreas Oak Woodland (SAOW) and the small area containing Monterey spineflower (*Chorizanthe pungens* var. *pungens*) on the above-referenced Lewis property in Larkin Valley, Santa Cruz County. This document was prepared in response to a Santa Cruz Co. Planning Dept. incomplete application letter (5/12/11) requesting a habitat management plan (Item # 3). Biotic reports by Albion Environmental (6/7/04, 8/14/04, 8/22/05) and J. Gilchrist & Associates (6/28/10) were reviewed for this plan. In addition, John Gilchrist conducted a site review on June 27 2011, to update and confirm locations of Chorizanthe, and update the composition of native and non-native plants within the Transitional San Andreas Oak Woodland.

Environmental Setting

Transitional San Andreas Oak Woodland. The transitional SAOW on this site (Figure 1) shows some evidence of previous disturbance and does not contain the diversity of native plant species (trees, shrubs and herbaceous) that is normally present in the SAOW. Species found in the area mapped as SAOW in 2004 and 2010 included coast live oak (*Quercus agrifolia*) with scattered poison oak (*Toxicodendron diversilobum*) and coffeeberry (*Rhamnus californica*), sky lupine (*Lupinus nanus*), California blackberry (*Rubus ursinus*) and bracken fern (*Pteridium aquilinum*). Non-native California annual grassland species included *Avena fatua, Brisa maxima, Bromus diandrus, Bromus hordaceus*). Additional species observed in summer 2011 included deerweed (*Lotus scoparius*), dandelion (*Taraxacum officinale*), Harding grass (*Phalaris aquatica*) and several French broom plants (*Genista monspessulana*). The dominant species, coast live oak, are less numerous and more widely dispersed than in the mapped SAOW to the southwest. The openings within the transitional SAOW are 10 to 40' with the larger openings just west of the water tank, and east and west of the dirt access road. The somewhat invasive harding grass is growing in these openings. The three small *Genista* plants are located in a small area just east of the access road.

Monterey Spineflower. The approximate 12' by 35' area containing Monterey spineflower is located immediately below (north of) the original Parcel C building envelope and just south of the Parcel B envelope. In 2011, the number of plants and geographic extent of spineflower on the Lewis property is the approximately the same as that observed in 2010. The spineflower assemblage consists of about 35-40 plants with some interspersed annual grassland and low-growing herbaceous species. This area also shows some evidence of previous disturbance, probably related to previous agricultural

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ATTACHMENT 1

activities at the site. Spineflower is an annual species that flowers in May-June and re-seeds each year.

Management Recommendations

Monterey Spineflower

1. Install a permanent low fence around the Monterey spineflower area. The fence should not restrict animal movement in and out but should prevent the inadvertent incursion of vehicles or heavy equipment. A single perimeter wire with stakes should be sufficient.

2. This small area does not show evidence of high weed growth. In fact most of the companion plant species were very low-growing—about 4-6" in height with widely interspersed higher growing annual grasses. However, if mowing is necessary for fire protection, it should be conducted in early spring (March) before flowering, or in late summer after spineflower becomes senescent. If mowing height is set above 5" the mower should have minimal effects upon lower growing spineflower.

Transitional San Andreas Oak Woodland

1. Propagate coast live oak from seed found at the site or within 3 miles of the site. Six to eight oaks should be planted within the larger openings in the transitional SAOW. After planting, install mesh screening around each plant to protect against herbivores, particularly deer. Screens may have to be adjusted as plants grow, and removed when plants reach a height where deer cannot browse them. Planting should occur in the fall, and the new oaks irrigated once a month for 2 years during the dry season with a drip irrigation system.

2. Remove the existing invasive non-native vegetation. The harding grass should be mowed in late spring and then spot treated with a 2 percent solution of glyphosate. Care must be taken not to overspray into oaks or other native vegetation. The three French broom plants should be removed by hand in winter 2012 prior to flowering. If additional broom plants are found in later years, they should also be removed when they are seedlings.

3. Annually in the spring, survey the transitional SAOW and SAOW for eucalyptus seedlings or sprouts and remove any small plants found.

4. A revegetation ecologist or botanist should flag low growing oak seedlings and other small natives so that they can be avoided during mowing activity, harding grass removal or any other activity that may impact native species.

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Monitoring and Maintenance

Monitoring inspection by a native plant revegetation specialist should occur during plant installation and once during the first year after installation. Yearly inspection is recommended during the years 2 and 3. Recommendations made during monitoring visits should be incorporated into the maintenance program below.

A revegetation maintenance program is recommended for a period of at least 3 years after completion of plant installation. The specific maintenance tasks are summarized below:

- Conduct routine maintenance of the irrigation system
- Remove any trash or debris that may hinder vegetation establishment
- Review any areas subject to erosion and provide erosion control recommendations to be carried out by the owner.
- Review plantings for herbivore damage and add or modify screens as necessary
- Remove any invasive non-native vegetation and assist with long range planning for eucalyptus, harding grass and French broom removal.
- Replace any planted oaks that do not survive the first two years
- Maintain complete notes on maintenance activities and dates

John Gilchrist

ATTACHMENT 14

REFERENCES

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ATTACHMENT 14

SITE RESOURCES & CONSTRAINTS MAP

SITE PHOTOS

ATTACHMENT 14

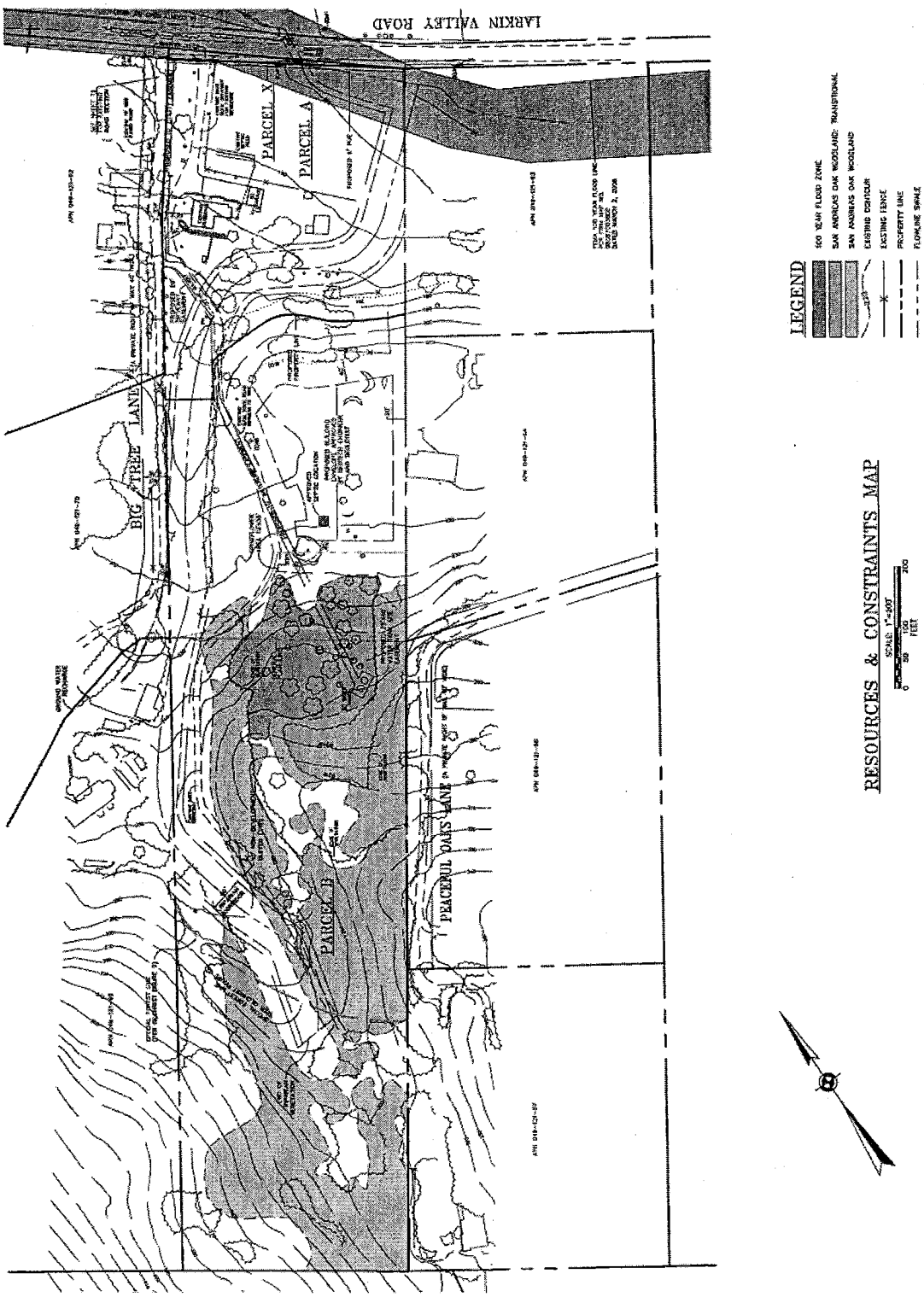

Figure 1. Resources and Constraints Map

ATTACHMENT 14

Photo 1. Monterey Spineflower, with low growing annual species

ATTACHMENT 14

Photo 2. Transitional San Andreas Oak Woodland, looking southeast

Photo 3. Transitional San Andreas Oak Woodland, looking east

ATTACHMENT 14

BRYAN M. MORI
BIOLOGICAL CONSULTING SERVICES
1016 Brewington Avenue, Watsonville, California, 95076. Tel/Fax 831.728.1043

5 August 2004

Zack Dahl
Steven Graves & Associates
2735 Porter
Soquel, CA 95073

RE: 711 LARKIN VALLEY ROAD - SANTA CRUZ LONG-TOED SALAMANDER ASSESSMENT

Dear Zack:

This report presents the findings of the Santa Cruz long-toed salamander (*Ambystoma macrodactylum croceum*) assessment performed on 711 Larkin Valley Road (A.P.N. 049 - 121 – 23). The purpose of the assessment was to evaluate the potential impacts of the proposed minor land division and associated development specifically to the Santa Cruz long-toed salamander. Although outside of the County's Salamander Protection District, the property is within an area defined as the Santa Cruz long-toed salamander Larkin Valley Complex (USFWS 1999), where several breeding ponds are present but their status in areas away from known breeding sites remains uncertain. Recommendations to avoid/minimize significant impacts are included in this report.

METHODS

The project site was traversed on 30 July 2004, using the Tentative Map (Mid Coast Engineers, dated 6/07/04; scale: 1 inch = 80 feet) and a similarly scaled aerial photograph as references. The survey was conducted at a level sufficient to characterize the principal plant communities on the site. Habitat conditions observed were recorded in a field notebook. The USGS Watsonville West Quadrangle was reviewed for the occurrence of off-site ponds within one mile of the project site. A literature review was conducted, which included accessing the California Natural Diversity Data Base (CNDDB), and other biologists were consulted for information on the presence of Santa Cruz long-toed salamanders in the project area. No focused surveys for long-toed salamanders were conducted as a part of this assessment.

ENVIRONMENTAL SETTING

The project site is located in Larkin Valley of the upper Harkins Slough watershed, west of Watsonville, California (Figure 1). Presently, the site encompasses 8.8 acres zoned as rural residential and 9.0 acres zoned agricultural, for a total of 17.8 acres. The topography on the site is

ATTACHMENT 15

gently sloped, with elevations ranging from around 110 feet at Larkin Valley Road up to about 360 feet at the southwest corner (Figure 2). An unnamed drainage runs along the northwestern boundary of the property and eventually flows into Harkins Slough at Larkin Valley Road. The vegetation on the property is a mosaic of oak woodland, willow riparian, eucalyptus grove, residential landscaping, and disturbed bare areas supporting a sparse cover of ruderal (weedy) species. Past land uses on the site included an orchard and cattle grazing (Z. Dahl and T. Mahoney, pers. comm.). Presently, the site supports a single-family house and auxiliary structures, an off-road practice course, and equestrian trails. The principal land uses in the surrounding landscape include rural residential development, equestrian uses and cattle grazing.

SANTA CRUZ LONG-TOED SALAMANDER

The Santa Cruz long-toed salamander was listed as endangered by the U.S. Fish and Wildlife Service in 1967 (USFWS 1999), and subsequently in 1970 by the State of California under the California Species Preservation Act (Ruth 1989). The Santa Cruz long-toed salamander is the southernmost subspecies of *Ambystoma macrodactylum* (Russell and Anderson 1956), and geographically isolated from the southern long-toed salamander (*Ambystoma macrodactylum sigillatum*) population, which is located 150 miles to the northeast in the Sierra Nevada (Russell and Anderson 1956). This species was first discovered in 1954 at Valencia Lagoon, near Aptos, in Santa Cruz County, California (Russell and Anderson 1956). Presently, there are 16 confirmed breeding sites, all clustered in southern Santa Cruz and northern Monterey Counties. In Santa Cruz County these sites are: Valencia Lagoon, Ellicott Pond, Green's Pond, Andersen's Pond, Seascape, Buena Vista Pond, Rancho Road Pond, Calabasas Pond (Harkins Slough), Millsap Pond, Tucker Pond, an unnamed pond near Aptos High School, and a recently discovered pond just southeast of the Calabasas pond (CNDDB 2004; D. Johnston, pers. comm.; M. Allaback, pers. comm.) In Monterey County the breeding sites are McCluskey Slough, Bennett/Struve Slough, Zmudowski State Beach and Moro Cojo Slough (USFWS 1999). Typical of salamanders in the Family Ambystomatidae, adult and sub-adult Santa Cruz long-toed salamanders spend most of the year in upland refugia, including rodent burrows, leaf litter, underneath surface objects, and in rotting logs within oak woodlands, riparian vegetation and mesic coastal scrub (Ruth 1989). Adults migrate from upland habitats to seasonal/semi-perennial breeding ponds at night, during late fall and winter rains, generally from November through March. In contrast juvenile dispersal is mostly confined to the first substantial fall rains, sometimes as early as August (M. Allaback, pers. comm.). Long-toed salamanders appear to travel in nearly straight lines, with marked individuals documented to migrate 0.6 mile from breeding ponds to upland habitat (USFWS 1999; M. Allaback, pers. comm.). However, unmarked long-toed salamanders have been observed 1 mile from the nearest breeding pond (USFWS 1999). Males usually precede females to the breeding site by one to two weeks, remain at the pond longer than females, and may mate with more than one female each season (Ruth and Tollestrup 1973; USFWS 1999). Mating and egg-laying generally peak in January and February (USFWS 1999). The female deposits 200 - 400 eggs singly on stems of emergent vegetation (Anderson 1967). After mating, the adults return to upland habitat within 6 - 12 weeks, typically by March or April (Ruth 1989; USFWS 1999). Eggs hatch within 15 - 30 days

and metamorphose into juveniles between May and September, depending on aquatic conditions. In drought years, larvae may perish prior to transformation due to insufficient water levels (Ruth 1989). Crustaceans (cladocerans and copepods) and tendipedids (midgefly larvae) are the primary food items of larvae (Anderson 1968). Recently metamorphosed salamanders (metamorphs) typically seek terrestrial refuge immediately adjacent to the breeding pond, and remain until dispersing during the first fall rains, however, early rains may induce metamorphs to move up to 200 feet from the breeding pond (Ruth 1989; USFWS 1999). Important prey for juveniles and adults include isopods (pillbugs), beetles, centipedes, earthworms and spiders (Anderson 1968). Adults are estimated to live up to twenty years (Ruth 1989). A long life span and high reproductive output are believed to be adaptations which allow for populations to persist at seasonal breeding sites during prolonged periods of drought (Reed 1979; Ruth 1989). Bullfrogs (*Rana catesbeiana*) and non-native predatory fishes have been implicated as serious predators of SCLTS (Ruth 1989; USFWS 1999).

Local Occurrence

The property is located within the Santa Cruz long-toed Salamander Larkin Valley Complex, an area encompassing both the Harkins Slough and a portion of the Corralitos Creek watersheds (USFWS 1999). The Larkin Valley Complex includes six known Santa Cruz long-toed salamander breeding ponds, as well as many other potential breeding sites. Two known breeding ponds occur within one mile of the project site; these include the Calabasas pond, which is 1 mile northwest of the property, and a recently discovered pond off of Metiver's Way, approximately 3,875 feet to the northwest (D. Johnston, pers. comm.) (Figure 3). Additionally, nine potential breeding ponds also occur within one mile of the property (Figure 3). Besides the known and potential breeding ponds, three observations of individuals have been documented within one mile of the project site (HRG 1994) (Figure 3).

Site Assessment

The property does not support known or potential Santa Cruz long-toed salamander breeding habitat. Although intermittent, shallow flow (< 2") was observed in the drainage on the property, long-toed salamanders require the quiet waters of pools and ponds for breeding and have not been documented to reproduce in creeks.

However, the willow riparian vegetation and closed canopy live oak woodlands on the property represent potential Santa Cruz long-toed salamander upland habitat (Figure 4). The quality of the upland habitat varies with understory cover. The willow riparian throughout the length of the drainage appeared to provide optimal upland conditions due to the diversity and density of understory vegetation and ground cover and mesic soil conditions. While all of the closed canopy live oak woodlands on the property could be considered potential upland habitat, the portion of oak woodlands along the western edge of the property appeared to be of higher quality due to the greater diversity and density of understory cover.

The presence of potential upland habitat, together with the ability of the Santa Cruz long-toed

salamander to travel long distances, the occurrence of known and potential breeding ponds within 1 mile of the property, and a record of an individual on Larkin Valley Road, approximately 1,500 feet to the northwest, suggests that this species could occur on the property.

POTENTIAL IMPACTS AND RECOMMENDATIONS

The Tentative Map (Figure 2) was analyzed for potential impacts to the Santa Cruz long-toed salamander. The applicant proposes to subdivide the property into three parcels (A, B and C). Parcel A will encompass the existing house, while a single-family home is proposed each for Parcels B and C. Unlike what is shown on the Tentative Map, access to Parcels B and C will be through the existing dirt road that runs through the property (Z. Dahl, pers. comm.).

Impact

Vegetation removal is expected to be minimal, due to the disturbed nature of the areas encompassed by the proposed building envelopes, especially for Parcel B (Z. Dahl, pers. comm.). However, grading associated with the building envelope of Parcel C, as well as road improvements, will result in the removal of minor areas of oak woodland vegetation, which potentially provides Santa Cruz long-toed salamander upland habitat. Therefore, the following measures are recommended. These measures are intended to avoid direct impacts to this species.

Recommendations

(1) No grading, vegetation removal or construction outside of the proposed disturbance limits associated with the building envelopes should be permitted. As proposed, structures should be sited within the open, disturbed areas, and roadways should follow existing roadbeds, to the greatest extent feasible. Landscaping around structures should be contained within the development envelopes.

(2) Prior to the start of grading, the perimeter of the development envelopes should be temporarily demarcated in the field with orange construction fencing to prevent inadvertent removal and disturbance of adjacent vegetation. No dumping of spoils, storage of construction materials or staging of equipment should be allowed in oak woodland or willow habitats adjacent to the development sites. The County should monitor the project prior to and during grading and construction to ensure this measure is properly implemented.

(3) Prior to the start of vegetation removal, a qualified biologist should conduct a pre-construction education session with the entire work crew. The session should address Santa Cruz long-toed salamander status, natural history, and identification, and the protection measures implemented as part of the project.

(4) Vegetation removal should be initially performed by hand-held tools and machinery.

A monitoring biologist should be present to search for long-toed salamanders during and following this process. Grubbing by heavy machinery should follow the hand removal of vegetation, upon authorization by the monitoring biologist. This procedure also should be implemented for vegetation removal required by the California Department of Forestry for fire control. The monitoring biologist should be present on the site during grading activities until the vegetation has been removed from the disturbance limits.

(5) If Santa Cruz long-toed salamanders are observed on site during construction, work should stop immediately and the CDFG and USFWS consulted for further guidance. No work should proceed until authorized by these agencies.

(6) No grading should be conducted during the rainy season from 15 October through 1 May.

(7) All trenches, pits, etc. should be filled prior to October 15.

If you have any questions or comments regarding this letter-report, please call me anytime.

Sincerely,

Bryan Mori
Consulting Biologist

ATTACHMENT 13

REFERENCES

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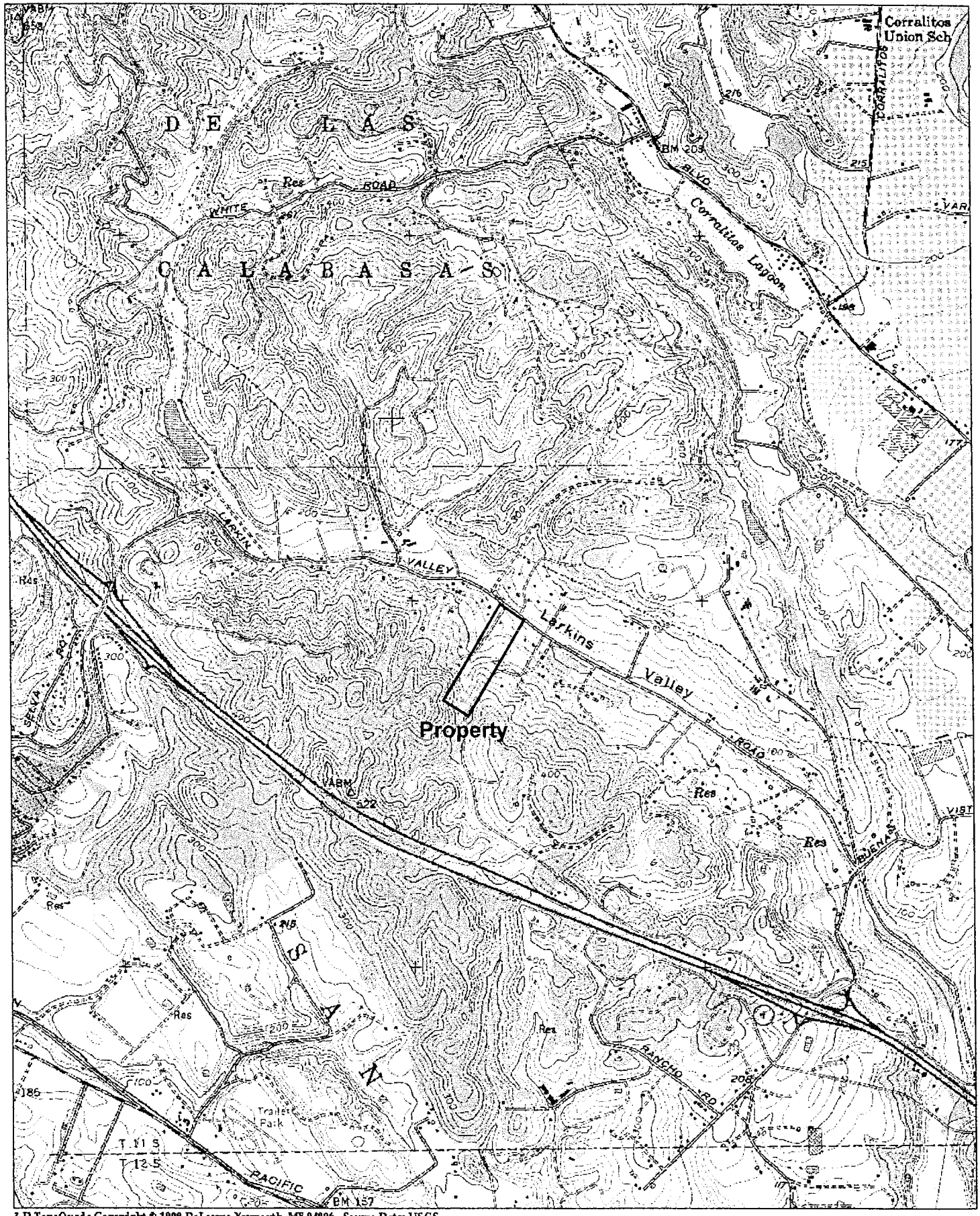
Persons Consulted:

ATTACHMENT 15

Dave Johnston, California Department of Fish and Game, Regional Environmental Specialist.
Mark Allaback, Biosearch Associates, Santa Cruz, CA.
Tom Mahoney, Botanist, Albion Environmental, Santa Cruz, CA.
Zach Dahl, Steve Graves and Associates, Soquel, CA.



3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Source Data: USGS 742 ft Scale: 1 : 25,000 Detail: 13-0 Datum: WGS84

Figure 1. 711 Larkin Valley Road Location Map. Bryan Mori Biological Consulting Services

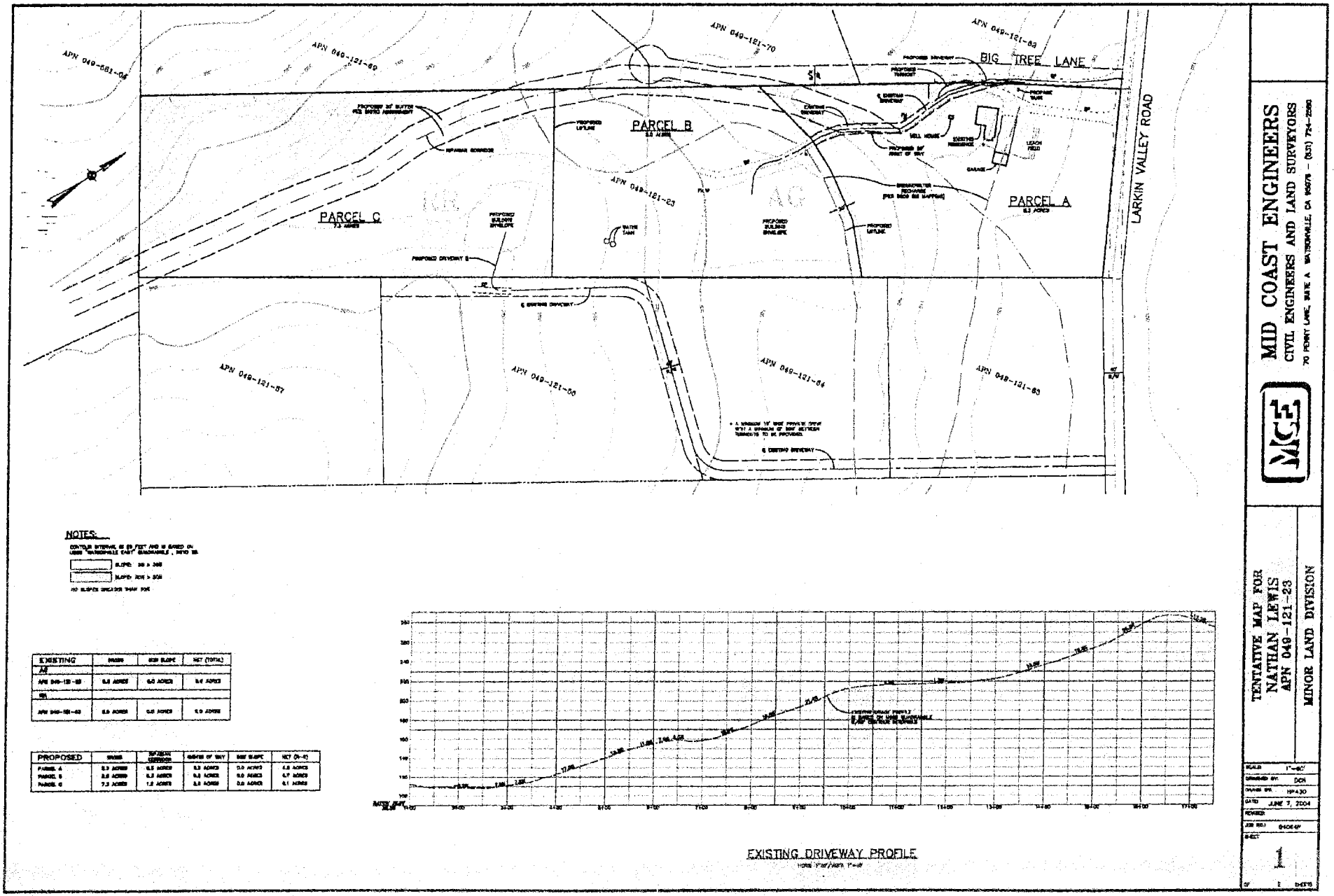


Figure 2. 711 Larkin Valley Road Project Site. Bryan Mori Biological Consulting Services

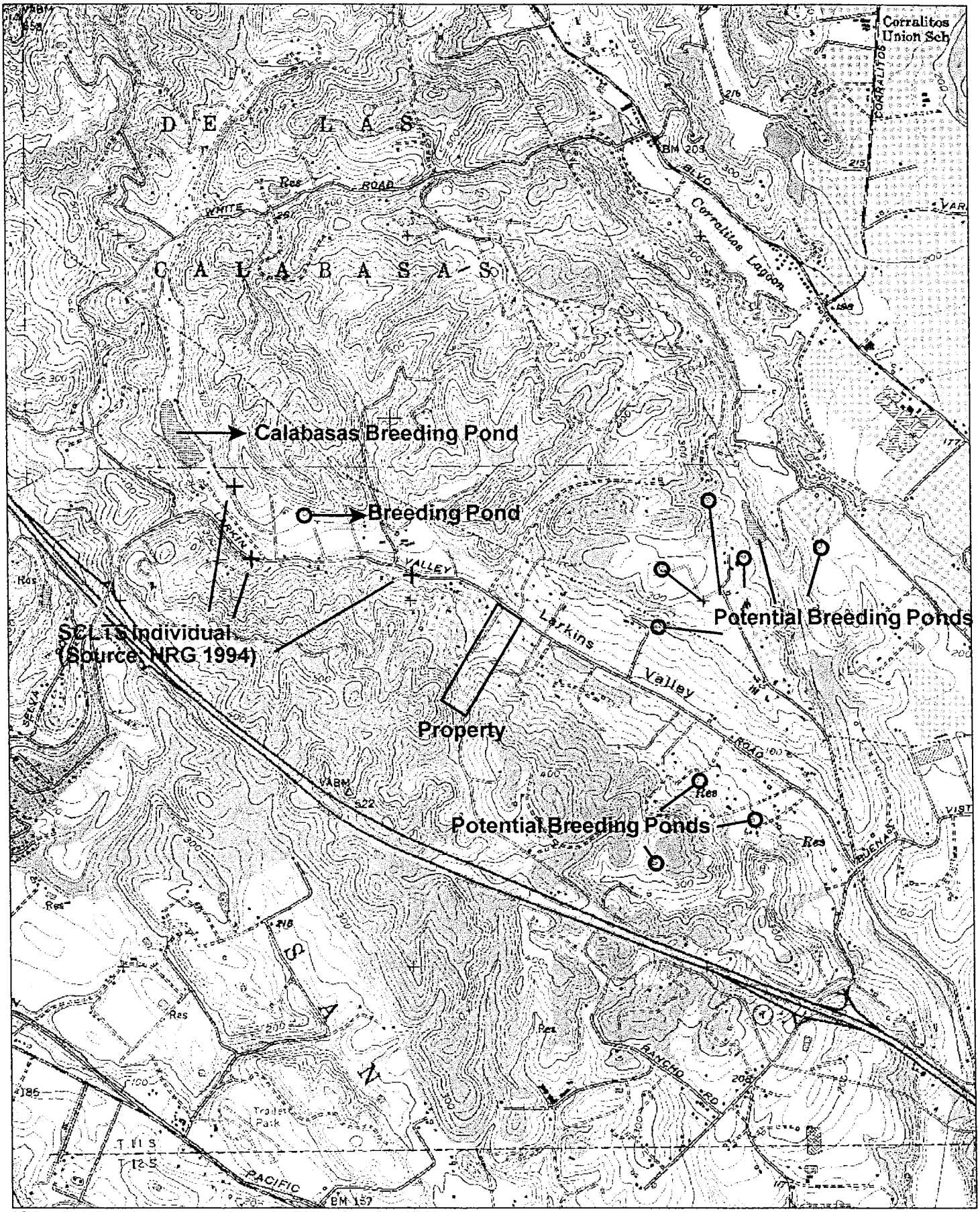


Figure 3. SCLTS Records & Potential Breeding Ponds within 1 Mile of Property.
Bryan Mori Biological Consulting Services

ATTACHMENT 15

Figure 4. Potential SCLTS Upland Habitat. Bryan Mori Biological Consulting Services

ATTACHMENT 15

EXHIBIT B

SANTA CRUZ ARCHAEOLOGICAL SOCIETY
1305 EAST CLIFF DRIVE, SANTA CRUZ, CALIFORNIA 95062

Preliminary Prehistoric Cultural Resource
Reconnaissance Report

Parcel APN: 049-121-23 SCAS Project #: SE-04-085

Planning Permit #: 04-0273 Parcel Size: 17 Acres

Applicant: Stephen Maas

Nearest Recorded Prehistoric Site: CA-SCR-152 & 158

On 7/3/04 (2) members of the Santa Cruz Archaeological Society spent a total of (2) hours on the above described parcel for the purposes of ascertaining the presence or absence of prehistoric cultural resources on the surface. Though the parcel was traversed on foot at regular intervals and diligently examined, the Society cannot guarantee the surface absence of prehistoric cultural resources where soil was obscured by grass, underbrush or other obstacles. No core samples, test pits, or any subsurface analysis was made. A standard field form indicating survey methods used, type of terrain, soil visibility, closest freshwater source, and presence or absence of prehistoric and/or historic cultural evidence was completed and filed with this report at the Santa Cruz County Planning Department.

The preliminary field reconnaissance did not reveal any evidence of prehistoric cultural resources on the parcel. The proposed project would therefore, have no direct impact on prehistoric resources. If subsurface evidence of such resources should be uncovered during construction the County Planning Department should be notified.

Further details regarding this reconnaissance are available from the Santa Cruz County Planning Department or from Rob Edwards, Director, Archaeological Technology Program, Cabrillo College, 6500 Soquel Drive, Aptos CA 95003, (831) 479-6294, or email redwards @Cabrillo.cc.ca.us.

Adams

COUNTY OF SANTA CRUZ

PLANNING DEPARTMENT
701 OCEAN STREET, SUITE 400, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123
TOM BURNS, DIRECTOR

July 9, 2004

Stephen Graves and Associates
2735 Porter Street
Soquel, CA 95073

SUBJECT: Archaeological Reconnaissance Survey for APN 049-121-23

To Whom It May Concern,

The County's archaeological survey team has completed the Phase 1 archaeological reconnaissance for the parcel referenced above. The research has concluded that pre-historical cultural resources were not evident at the site. A copy of the review documentation is attached for your records. No further archaeological review will be required for the proposed development.

Please contact me at 831-454-3372 if you have any questions regarding this review.

Sincerely,

Elizabeth Hayward
Planning Technician

Enclosure

ATTACHMENT 1 C

AGRICULTURAL VIABILITY STUDY
LANDS OF LEWIS – LARKIN VALLEY ROAD, WATSONVILLE
April 2011 (UPDATED)

This agricultural viability study has been prepared pursuant to Santa Cruz County General Plan Policy 5.13.21 - Determining Agricultural Viability, and is intended to address the agricultural viability of the Lewis property located at 711 Larkin Valley Road in Watsonville (APN 049-121-23). The property is 17.6± acres in size and is currently proposed for a 2-lot Minor Land Division. The primary purpose of this study is to provide background information regarding the viability of the subject property for commercially viable agriculture and to assist the County Agricultural Policy Commission in its determination of agricultural viability.

This study is organized to address and provide information regarding the following considerations with respect to Agricultural Viability.

- Current Use of Property and Proposed Future Uses of Land Designated as Non-Commercial Agriculture.
- Historical Agricultural Uses on Property and Adjacent Parcels.
- County General Plan and Zoning Maps, Surrounding Parcel Sizes and Land Uses.
- Soil Characteristics of Subject Parcel and Surrounding Parcels.
- General Suitability for Commercially Viable Land.

Site Location and Project Description

The subject parcel is approximately 1.4 miles northwest of Watsonville along Larkin Valley Road. As shown on the attached 2-lot minor land division tentative map, all three parcels will have access off of Larkin Valley Road. The existing house which fronts on Larkin Valley Road will encompass Parcel A. Parcel B will access Larkin Valley Road via Big Tree lane and a private 12' wide driveway which runs along the south east boundary. The property slopes up from Larkin Valley Road with a drainage channel transversing it approximately 400' into the property. The upper portion of the property is sparsely covered with stands of Coast Live Oak. The site currently contains an older residence, a detached garage and a well house.

The proposed minor land division would divide the 17.6-acre parcel into two parcels as shown on the attached tentative map. Parcel A would be 4.18 acres gross, Parcel B would be approximately 13.39 acres gross. As currently designated under the Santa Cruz General Plan, the front portion of the property, 8.6 acres, is designated at Agricultural.

ATTACHMENT 1

Current Use of Property and Proposed Future Uses of Land Designated as Non-Commercial Agriculture

There are no agricultural uses occurring on the property, nor is there any sign of recent agricultural activities on the site or on adjacent parcels. The portion of the property designated as Agricultural is moderately sloped, characterized by sandy and/or clay soils, and has a drainage channel running through the middle of it.

Historical Agricultural Uses on Property and Adjacent Parcels

There are no known records of any commercial agricultural uses or activity that has ever taken place on the portion of the property designated as Agricultural or on any of the adjacent Agricultural parcels. In 1974, a 20-year, non-agricultural open space easement was recorded on the property. This easement lasted 20 years and expired in 1994, it was not renewed. The open space easement allowed for agricultural uses if so desired by the owner, but in this case, the easement was used for tax purposes.

It should be noted that historical photos dating back to 1948 show the entire property cleared and the upper portion of the site used as orchards. As shown in the series of photos it was not evident until the 1975 photos that the upper areas of the site had begun to revegetate with native vegetation. It is anticipated the orchard use ceased in the late 1960's.

County General Plan and Zoning Maps, Surrounding Parcel Sizes and Land Uses.

Figure 1 contains a map of the General Plan land uses and surrounding parcels. The parcels in the 1/4 - mile range around the subject property range in size from 2 to 15 acres in size. As shown, on the map, the subject property is surrounded on all sides by residential land, with more then 50% of the properties designated as Rural Residential. Residential parcels to the north and west of the site typically range in size from 1 to 15 acres. Properties to the east typically range in size from 2 to 20+ acres and vary between residential and agricultural uses. Residential properties to the south typically range in size from 5 to 20+ acres.

Soil Characteristics of Subject Parcel and Surrounding Parcels.

Figure 2 contains a map of site soils obtained from the Santa Cruz County Soil Survey. As shown, the site soils in the Agriculture designated area is comprised of #105 - Baywood Sandy Loam (2-15% slope) - capability IVe irrigated, VIe non-irrigated; #125 - Danville Loam (15-30% slope) capability IIIe irrigated and non-irrigated, and #135 – Elkhorn Sandy Loam, (15%-30% slope) – capability VIe irrigated and IVe non-irrigated

The soil survey defines the capability classes of the subject property soils as follows:

- Class III soils have severe limitations that reduce the choice of plants, or that require special conservation practices, or both.
- Class IV soils have very severe limitations that reduce both the choice of plants, or that require very careful management or both.
- Class V soils have are not likely to erode but have other limitations, impractical to remove, that limit their use.
- Class VI soils have severe limitations that make them generally unsuitable for cultivation.

It is apparent from the site soils that severe limitations for farming exist.

General Suitability for Commercially Viable Land.

The site is not viable for commercial agriculture due to poor soils, moderately steep slope conditions along the drainage swale that crosses the property, and the parcel is east facing and thus gets minimal afternoon sun. In addition, since the lower portion of the property is fragmented due to existing roads, the drainage channel and the location of the home site, there are only two small, separated areas of undeveloped land that remain. On the lower northeast portion of the property, there is an area approximately 1.2 acres in size, and further up the property along the eastern boundary, there is an area of approximately 2.4 acres. These factors combined with the lack of any historical evidence that the Agriculturally designated portion of the property has ever been viable for commercial agricultural uses concludes that this parcel is not suitable for any commercial agricultural uses.

Summary and Conclusion

The proposed land division would subdivide the property into two parcels 4.18 and 13.39 acres in size. Parcel A use would not change and Parcel B would be developed as residential uses with a single family residence. This proposed use would appear to be appropriate for the project site. The neighboring parcels which are designated as Agricultural are also being used as residential and thus there will not be any need to place buffers along the property boundaries. A determination of non-viability would apply only to this site and would have no impact on the viability or allowed uses on adjacent parcels.

It appears that the findings for non-viability can be made based upon the following:

- It appears that the entire parcel has never been commercially farmed and that the vast majority of the site is not suitable for commercial farming.
- Site soils range from Class III to Class VI, which have very severe limitations for farming.
- The parcel lacks a viable farmable area. Approximately 3.6 acres of unimproved land segmented into two areas exist within the Ag area.

ATTACHMENT 17

- All proposed building sites are within 1/2 mile of a County maintained road (Larkin Valley Road).
- Less than 50% of the land within 1/4 mile of the subject parcel is designated as Agricultural and/or Mountain Residential; no active farming is occurring adjacent to or nearby the site.

We have also attached as Exhibit B, a letter from retired Agricultural Commissioner Richard Nutter who agrees that the site is not viable for commercial agriculture.

ATTACHMENTS:

Figure 1 – General Plan Map
Figure 2 - Site Soils Map
Exhibit A – 20-year Non-Agricultural Open Space Easement
Exhibit B – Letter from Richard Nutter, Retired Agricultural Commissioner

Richard Nutter

104 Glen Lake Drive ❖ Pacific Grove CA 93950
Phone and Fax: (831) 649-4230 ❖ [redacted]

To: Agricultural Policy Advisory Commission
c/o Samantha Haschert
County of Santa Cruz Planning Department

Date: 2/28/2010

Subject: Nathan Lewis Minor Land Division #10-0030 APN 049-121-23

At the request of Stephen Graves and with agreement of Nathan Lewis I have been retained to review the Agricultural Viability Study of the above Minor Land Division.

I visited the site and toured the proposed development with Mr. Lewis for the purpose of making my best informed decision.

After a review of the Agricultural Viability Study it is my finding that the it meets the criteria as stated in the Santa Cruz County General Plan Policy 5.13.21.

My professional opinion is that the proposed land division is not viable for agriculture. This conclusion is supported by the following:

1) The parcel does not have a history of commercial agriculture.
2) There does not appear to be any commercial agriculture occurring on any other parcels in the Larkin Valley corridor.
3) Site soils lack proper drainage and would pose significant constraints to farming.
4) The majority of the area designated as Agriculture is developed with the existing residence and its associated improvements, resulting in a lack of contiguous farmable area.

Richard C. Nutter

Richard Nutter
Monterey County Agricultural Commissioner (Retired)
Past Santa Cruz County Agricultural (1984-85)

ATTACHMENT 17

V. REFERENCES USED IN THE COMPLETION OF THIS ENVIRONMENTAL REVIEW INITIAL STUDY

County of Santa Cruz 1994.
1994 General Plan and Local Coastal Program for the County of Santa Cruz, California. Adopted by the Board of Supervisors on May 24, 1994, and certified by the California Coastal Commission on December 15, 1994.

VI. ATTACHMENTS

1. *Vicinity Map, Map of Zoning Districts; Map of General Plan Designations; and Assessor's Parcel Map.*
2. *Tentative Map & Preliminary Improvement Plans*, prepared by Roper Engineering, dated 4/18/11; revised 7/20/11 and 10/17/11
3. *Geologic Investigation and Updates(Report Summary, Conclusions, Recommendations,* prepared by Upp Geotechnology, Inc. dated 5/19/05, updated 8/21/06 and 02/21/07
4. *Geotechnical Investigation and Update (Conclusions and Recommendations)*, prepared by Dees & Associates, dated 08/21/06, updated 3/23/07
5. *Geologic and Geotechnical Report Review Letter*, prepared by Joe Hanna, County geologist, dated 4/13/07
6. *Hydrogeologic Report and Response to County Comments*, prepared by Upp Geotechnology, Inc. dated 10/05/09.
7. *Hydrogeologic Report Review Letter*, prepared by Joe Hanna, County geologist, dated 01/21/10
8. *Septic Lot Check*, prepared by Environmental Health Services, dated 6/8/04
9. *Discretionary Application Comments*, dated 09/18/12
10. *Drainage Calculations*, prepared by Roper Engineering, dated 4/13/11
11. *Biotic Report*, prepared by John Gilchrist & Associates, dated 2/23/10, revised 6/28/10
12. *Biotic Report Review,* prepared by EcoSystems West, dated 9/1/10
13. *Biotic Report Review Letter*, prepared by Matt Johnston, dated 9/2/10
14. *Habitat Management Plan,* prepared by John Gilchrist & Associates, dated 6/28/11
15. *Santa Cruz Long-Toed Salamander Assessment,* prepared by Bryan M. Mori, dated 8/5/04
16. *Archaeological Survey (Cover Sheet) and County Review Letter,* prepared by Rob Edwards, Cabrillo College, dated 7/3/04
17. *Agricultural Viability Study* reviewed by Richard Nutter, dated 2/28/10

ATTACHMENT 7