

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

NOTICE OF ENVIRONMENTAL REVIEW PERIOD

SANTA CRUZ COUNTY

APPLICANT: Pete and Haruyo Pearson

APPLICATION NO.: 08-0106

APN: 102-121-33, -34, -37, and -70

The Environmental Coordinator has reviewed the Initial Study for your application and made the following preliminary determination:

XX

Negative Declaration

(Your project will not have a significant impact on the environment.)

XX _____ Mitigations will be attached to the Negative Declaration.

____ No mitigations will be attached.

Environmental Impact Report

(Your project may have a significant effect on the environment. An EIR must be prepared to address the potential impacts.)

As part of the environmental review process required by the California Environmental Quality Act (CEQA), this is your opportunity to respond to the preliminary determination before it is finalized. Please contact Matt Johnston, Environmental Coordinator at (831) 454-3201, if you wish to comment on the preliminary determination. Written comments will be received until 5:00 p.m. on the last day of the review period.

Review Period Ends: FEBRUARY 19, 2009

KENT EDLER

Staff Planner

Phone: (831) 454-3168

Date: January 14, 2009

 NAME:
 Pearson Gully Infill

 APPLICATION:
 08-0106

 A.P.N:
 102-121-33, 34, 37, 70

NEGATIVE DECLARATION MITIGATIONS

- 1. In order to minimize impacts to air quality:
 - a. Standard dust control BMPs shall be implemented during all grading and demolition work.
 - b. In order to ensure that the one hour air quality threshold for the pollutant acrolein is not exceeded during demolition and paving, prior to the issuance of the grading permit, the applicant shall modify the grading plans to include notes incorporating the construction conditions given by the Monterey Bay Unified Air Pollution Control District (MBUAPCD) as follows:
 - i. All pre-1994 diesel equipment shall be retrofitted with EPA certified diesel oxidation catalysts *or* all such equipment shall be fueled with B99 diesel fuel;
 - ii. Applicant shall retain receipts for purchases of catalysts or b99 diesel fuel until completion of the project;
 - iii. Applicant shall allow MBUAPCD to inspect receipts and equipment throughout the project.

Alternatively, the applicant may submit a health risk assessment to the MBUAPCD for review and approval. Any recommendations and requirements of the MBUAPCD will become conditions of constructing the project.

COUNTY OF SANTA CRUZ PLANNING DEPARTMENT

Date: January 12, 2009 Staff Planner: Kent Edler

ENVIRONMENTAL REVIEW INITIAL STUDY

APPLICANT: Pete and Haruyo Pearson SUPERVISORAL DISTRICT: First OWNER: Pete and Haruyo Pearson APPLICATION NO: 08-0106

APN: 102-121-33, 34, -37, 70

LOCATION: Property located Southwest of the end of Benedict Avenue at about 125 feet West of the intersection with Cabrillo Avenue (101 Benedict Avenue).

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.

Х	Geology / Soils	 Noise
Х	Hydrology / Water Supply / Water Supply	 Air Quality
	Biological Resources	 Public Services & Utilities
	Energy & Natural Resources	 Land Use, Population & Housing
	Visual Resources & Aesthetics	 Cumulative Impacts
Х	Cultural Resources	Growth Inducement
	Hazards & Hazardous Materials	 Mandatory Findings of Significance
	Transportation / Traffic	

EXISTING SITE CONDITIONS

 Parcel Size:
 102-121-33 - 7.08 acres;
 102-121-34 - .161 acres

 102-121-37 - .614 acres;
 102-121-34 - 2.891 acres

 Existing Land Use:
 102-121-33 Elementary School

 102-121-34,
 102-121-37 Vacant

 102-121-70
 Single Family Residence

Vegetation: Eucalyptus (in project area)

Slope: Majority of slopes in the project area are greater than 50% **Nearby Watercourse**: Arana Gulch **Distance To:** ~4,500 feet

Rock/Soil Type: Marine Terrace deposits, Purisima form. sandstone bedrock

ENVIRONMENTAL RESOURCES AND CONSTRAINTS

Groundwater Supply: No Water Supply Watershed: None Mapped Groundwater Recharge: Portion (non-project area) Timber or Mineral: None Mapped Liquefaction: Negligible Potential Fault Zone: None Mapped Scenic Corridor: None Mapped

Historic: None Mapped

Agricultural Resource: None Mapped Biologically Sensitive Habitat: No Fire Hazard: None Mapped Floodplain: None Mapped Erosion: High Erosion Potential Landslide: N/A

SERVICES

Fire Protection: Central F.P.D. School District: PVUSD Sewage Disposal: Septic Archaeology: None Mapped Noise Constraint: None Mapped Electric Power Lines: Yes Solar Access: Adequate Solar Orientation: Level Hazardous Materials: None

Drainage District: Zone 5 Project Access: Benedict Avenue Water Supply: Well

Special Designation: No

PLANNING POLICIES Zone District: RA General Plan: Suburban Residential Urban Services Line: Outside Coastal Zone: Outside

PROJECT SUMMARY DESCRIPTION:

Proposal to grade approximately 31,980 cubic yards of material, install a drainage pipe and to remove around 93 trees from within a Riparian Corridor in order to resolve a slope failure. Requires Preliminary Grading approval, a Riparian Exception and a Soils Report Review.

PROJECT SETTING AND BACKGROUND:

The majority of the drainage from the Santa Cruz Gardens sub-division drains to the head of a ravine on the subject property via a 24" culvert. Prior to construction of the sub-division, it is estimated that the tributary drainage area that outletted in the ravine was 5 acres. The construction of the sub-division altered the tributary drainage area to approximately 17 acres. This three-fold increase in drainage area has resulted in an increase in the average discharge as well as an increase in the peak runoff, thus causing accelerated erosion in the ravine. This erosion has caused the failure of slopes behind several houses along Cabrillo Avenue as well as causing many large Eucalyptus trees to fall over.

The drainage and erosion problems were the subject of a lawsuit involving the applicant, several property owners in the Santa Cruz Gardens sub-division and the County of Santa Cruz. The project proposed is to rectify drainage and accelerated erosion on the subject properties. The project will also stabilize the slopes behind the houses along Cabrillo Avenue.

DETAILED PROJECT DESCRIPTION:

Application 08-0106 proposes to install approximately 383 feet of 30" drainage pipe to the end of the existing 24". At the end of the new 30" pipe, a gabion energy dissipater will be installed. The pipe will be backfilled to approximately the same level as Benedict Avenue. Approximately 93 Eucalyptus trees were removed for preparation of this project. This application also includes a restoration / replanting plan that includes planting of native species in the project area.

Significant Or Potentially Significant Impact Less than Significant with Mitigation Incorporation

Less than Significant Impact or No Impact

Not Applicable

ENVIRONMENTAL REVIEW CHECKLIST

A. Geology and Soils

Does the project have the potential to:

- 1. Expose people or structures to potential adverse effects, including the risk of material 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 as identified by other substantial evidence?

All of Santa Cruz County is subject to some hazard from earthquakes. The project area is located approximately 27 kilometers from the nearest fault zone. This project also does not include any new structures.

B. Seismic ground shaking?

See comment A-1-a.

C. Seismic-related ground failure, including liquefaction?

Not described as a potential hazard in the Geotechnical Investigation prepared by GeoForensics, Inc. (Attachment 4).

D. Landslides?

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This project will fix slope stability issues and will therefore reduce exposure to landsliding.

2. Subject people or improvements to damage from soil instability as a result of on- or off-site landslide, lateral spreading, to subsidence, liquefaction, or structural collapse?

Not described as a potential hazard in the Geotechnical Investigation (referred to in comment A-1-c).

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3.	Develop land with a slope exceeding 30%?			X	
The struct	majority of the project is located on slope tures, roads or other development being pr	es greater oposed w	r than 30% ith this proj	, but the ect.	re are no
4.	Result in soil erosion or the substantial loss of topsoil?			X	
The pand i contridrain erosi	project as designed will reduce the erosion mproving drainage. Additionally, a re-vege ol erosion. Control of the surface runoff age plan as well as implementation of an on in the proposed development.	n in the a tation pla as propo erosion o	rroyo by sta n will be in osed in the control will	abilizing t oplemente site gra adequate	he slopes ed to help ading and ely control
5.	Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to property?			X	
Not o comr	described as a potential hazard in the Generit A-1-c).	eotechnica	al Investiga	tion (refe	erred to in
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?	- -		X	
This	project does not affect a sewage disposal s	system.			
7.	Result in coastal cliff erosion?	<u></u>			X
Proje	ect site is not located adjacent to, or otherw	ise near,	a coastal cl	iff.	
<u>B. H</u> Does	ydrology, Water Supply and Water Qual the project have the potential to:	lity			
1.	Place development within a 100-year flood hazard area?				X
Proje	ect site is not located within a floodway or fl	oodplain.			

Less than Significant **Environmental Review Initial Study** Significant Or Less than Page 6 Potentially with Significant Mitigation Impact or Significant Impact Incorporation No Impact Not Applicable 2. Place development within the floodway resulting in impedance or redirection of Х flood flows? See comment B-1. Be inundated by a seiche or tsunami? 3. Х

The project site is located approximately 2.5 miles from the Pacific Ocean and is located approximately 280 feet above sea level. Additionally, the site is not located in a tsunami inundation area on the County of Santa Cruz Tsunami Inundation Areas map.

4. Deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit, or a significant contribution to an existing net deficit in available supply, or a significant lowering of the local groundwater table?

The property is not mapped as primary groundwater recharge. There is expected to be a temporary increase in the amount of water used for soil conditioning during construction, but this is not expected to have an affect on available supply of groundwater.

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5. Degrade a public or private water supply? (Including the contribution of urban contaminants, nutrient enrichments, or other agricultural chemicals or seawater intrusion).

See comment B-4.

6. Degrade septic system functioning?

The project does not affect any septic systems.

7. Alter the existing drainage pattern of the site or area, including the alteration of the course of a stream or river, in a manner which could result in flooding, erosion, or siltation on or off-site?

The existing drainage pattern in the project area will be altered by the extension of

Significant Or Potentially Significant Impact Less than Significant Less than with Significant Mitigation Impact or Incorporation No Impact

t Not Applicable

identified to pose an imminent threat to the adjacent homes due to the failing slopes, so a permit (see Attachment 5) to remove the trees was issued in October 2008. The permit included a condition to only allow removal of the trees outside of the raptor nesting season (the raptor nesting season runs from January 1-July 31). All trees were removed between October and December 2008. After completion of the grading the site will be re-vegetated with native species.

The project is also intended to fix an erosion and slope stability problem on the site, so the project is expected to improve the biotic community in the riparian corridor by reducing the downstream sediment load and also with re-vegetation with native species in the project area.

3. Interfere 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?

The project does not propose any other activity that will restrict or interfere with movement of migratory fish or wildlife species. As stated in comment C-2, above, the tree removal was performed outside of the nesting raptor season per the requirements of the removal permit.

4. Produce nighttime lighting that will illuminate animal habitats?

This project does not propose or involve any nighttime lighting.

5. Make a significant contribution to the reduction of the number of species of plants or animals?

This project includes a re-vegetation plan that was reviewed and approved by Environmental Planning staff. Implementation of the approved re-vegetation plan reduces the impact to less than significant.

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approximately 383' of drainage pipe. Also the site will be re-graded in a manner to reduce slope instability and the reduce runoff. The drainage and grading work being proposed is not expected to increase flooding and is intended to reduce erosion and offsite siltation by reducing the exit velocity of the collected storm waters from the Santa Cruz Gardens sub-division.

8. Create or contribute runoff which would exceed the capacity of existing or planned storm water drainage systems, or create additional source(s) of polluted runoff?

See comment B-7.

9. Contribute to flood levels or erosion in natural water courses by discharges of newly collected runoff?

See comments B-1 and B-7.

10. Otherwise substantially degrade water supply or quality?

See comments B-4 and B-7.

C. Biological Resources

Does the project have the potential to:

1. Have an adverse effect 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 Service?

There are no special status wildlife species identified as being located in the project area. Also see comment C-2, below.

2. Have an adverse effect on a sensitive biotic community (riparian corridor), wetland, native grassland, special forests, inter-tidal zone, etc.)?

_____ X____

The existing site was covered with non-native Eucalyptus trees. These trees were

See comments C-1 & C-2.

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6. Conflict with any local policies or protecting biological ordinances resources (such as the Significant Tree Protection Ordinance. Sensitive Habitat Ordinance, provisions of the Design Review ordinance protecting trees with trunk sizes of 6 inch diameters or greater)?

> Conflict with the provisions of an adopted Habitat Conservation Plan, Biotic Conservation Easement, or other approved local, regional, or state

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There are no conservation plans or biotic conservation easements in effect or planned in the project vicinity.

D. Energy and Natural Resources

Does the project have the potential to:

habitat conservation plan?

1. Affect or affected be bv land designated as "Timber Resources" by the General Plan?

The parcels included in this project as well as adjoining parcels are not mapped as "Timber Resources."

2. Affect or be affected by lands currently utilized for agriculture, or designated in the General Plan for agricultural use?

The project site does not contain any land designated as agricultural resource.

3. Encourage activities that result in the use of large amounts of fuel, water, or energy, or use of these in a wasteful manner? Х

The project will not involve the use of large amounts of fuel, water, and energy, or the use of these resources in a wasteful manner.

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4. Have a substantial effect on the potential use, extraction, or depletion of a natural resource (i.e., minerals or energy resources)?

The project will not include or require the substantial extraction or consumption of minerals, energy resources, or other natural resources.

E. Visual Resources and Aesthetics

Does the project have the potential to:

1. Have an adverse effect on a scenic resource, including visual obstruction of that resource?

The project will 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?

The project site is not located along a County designated scenic road or within a designated scenic resource area.

3. Degrade the existing visual character or quality of the site and its including surroundings, substantial change in topography or ground and/or surface relief features. development on a ridgeline?

The proposed project proposes changing the existing topography in order to control erosion and provide slope stability. However, since the area where this project will occur is relatively small (approximately an acre) and includes a re-vegetation plan, it will not degrade the visual character of the site.

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

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The project does not propose a new source of light.

X

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Not Applicable

5. Destroy, cover, or modify any unique geologic or physical feature?

There are no unique geological features on or adjacent to the site that would be destroyed, modified or covered by the project.

F. Cultural Resources

Does the project have the potential to:

1. Cause an adverse change in the significance of a historical resource as defined in CEQA Guidelines 15064.5?

No designated historical resources are present on the project site.

Cause an adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines 15064.5?

An archaeology report was prepared in 1980 by Archaeological Resource Service as part of previous proposed project. The one potential cultural resource area identified in that report will not be disturbed by the proposed project as it is located approximately 500' away from the proposed driveway.

3. Disturb any human remains, including those interred outside of formal cemeteries? X

No archeological resources have been identified in the project area. Pursuant to County Code Section 16.40.040, if at any time in the preparation for or process of excavating or otherwise disturbing the ground, any human remains of any age, or any artifact or other evidence of a Native American cultural site which reasonably appears to exceed 100 years of age are discovered, 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.

4. Directly or indirectly destroy a unique paleontological resource or site? X

No paleontological resources have been identified on the project site.

Environmental Review Initial Study Page 12		Significant Or Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact or No Impact	Not Applicable
<u>G.</u> Doe:	Hazards and Hazardous Materials s the project have the potential to:				
1.	Create a significant hazard to the public or the environment as a result of the routine transport, storage, use, or disposal of hazardous materials, not including gasoline or other motor fuels?			X	
The	proposed project will not involve handling o	or storage	of hazardo	us materi	als.
2.	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?				X
The	project site is not listed as a known hazard	ous mater	ials site.		
3.	Create a safety hazard for people residing or working in the project area as a result of dangers from aircraft using a public or private airport located within two miles of the project site?				X
The haza	parcel and the project are not located wit ards for people residing in the project area a	thin the A are low.	irport Cleai	r Zones a	and safety
4.	Expose people to electro-magnetic fields associated with electrical transmission lines?				X
Ther	e are no high-voltage transmission lines or	n the proje	ct site.		,
5.	Create a potential fire hazard?			X	
The this	project design will incorporate all applicat project does not involve any structures.	ble fire sa	fety code r	equireme	nts. Also

	Significant Or Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact or No Impact	Not Applicable
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 Release bio-engineered organisms or chemicals into the air outside of project buildings?

The project will not involve processes which could result in the release of bioengineered organisms or chemical agents.

H. Transportation/Traffic

Does the project have the potential to:

1. Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?

This project does not involve the addition of any new dwelling units or structures so the project will not increase traffic to the parcels

2. Cause an increase in parking demand which cannot be accommodated by existing parking facilities?

See response to H.1, above.

3. Increase hazards to motorists, bicyclists, or pedestrians?

See response to H.1, above.

4. Exceed, either individually (the project alone) or cumulatively (the project combined with other development), a level of service standard established by the county congestion management agency for designated intersections, roads or highways?

See response to H.1, above.

_____X

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I. Noise

Does the project have the potential to:

1. Generate a permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

The project does not propose anything which would generate a permanent increase in ambient noise levels.

2. Expose people to noise levels in excess of standards established in the General Plan, or applicable standards of other agencies?

Noise levels at the project site are not anticipated to exceed established standards.

3. Generate a temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Noise generated during construction for the proposed project will increase the ambient noise levels for adjoining areas. Given the limited duration of this construction related impact, it is considered to be less than significant.

J. Air Quality

Does the project have the potential to:

(Where available, the significance criteria established by the MBUAPCD may be relied upon to make the following determinations).

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

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Project construction may result in a short-term, localized decrease in air quality due to generation of dust and particulate matter (PM10). Standard dust control best management practices, such as periodic watering, will be implemented during construction to reduce impacts to a less than significant level. Additional measures shall be required to reduce the production of emissions (acrolein) from diesel equipment during the construction phase of the project.

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2. Conflict with or obstruct implementation of an adopted air quality plan?

The proposed project does not include activities that could conflict with or obstruct any adopted air quality plan.

3. sensitive Expose receptors to Х substantial pollutant concentrations?

Santa Cruz Gardens Elementary School is located adjacent to the construction limits, but the project is not expected to generate a substantial concentration of pollutants that would impact the school.

Create objectionable odors affecting a 4. substantial number of people?

See comment J-3, above.

K. Public Services and Utilities

Does the project have the potential to:

- 1. Result in the need for new or physically altered public 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? Х The project does not contribute to the need for services. b. Police protection? Х The project does not contribute to the need for services. Х c. Schools?

The project does not contribute to the need for services.

Enviro Page 1	nmental Review Initial Study I6	Significant Or Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact or No Impact	Not Applicable
	d. Parks or other recreational activities?			<u> </u>	
The p	roject does not contribute to the need for	services.			
	e. Other public facilities; including the maintenance of roads?			X	
The p	roject does not contribute to the need for	services.			
2.	Result in the need for construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			X	
One o syster is exp	of the main reasons for this project is to m that is currently causing erosion and s pected to reduce the amount of erosion an	o make re lope instab d downstre	pairs to an ility. The p eam sedime	existing roject as entation.	drainage proposed
3.	Result in the need for construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			X	
The p	roject does not contribute to the need for	services.			
4.	Cause a violation of wastewater treatment standards of the Regional Water Quality Control Board?			X	
The p	roject does not affect any sewer, wastewa	ater or sep	tic system.		
5.	Create a situation in which water supplies are inadequate to serve the project or provide fire protection?			X	
The p	roject does not contribute to the need for	services.			
6.	Result in inadequate access for fire protection?			X	
The p	roject does not alter existing access to the	e structure	s on Bened	lict Avenı	le.

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 Make a significant contribution to a cumulative reduction of landfill capacity or ability to properly dispose of refuse? X

The project is not expected to generate a significant amount of refuse. Additionally, the project includes import of soils that potentially would have ended up in a landfill.

8. Result in a breach of federal, state, and local statutes and regulations related to solid waste management?

The project will not include any activity that would result in a breach of statutes or regulations related to solid waste management.

L. Land Use, Population, and Housing

Does the project have the potential to:

1. Conflict with any policy of the County adopted for the purpose of avoiding or mitigating an environmental effect?

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

2. Conflict with any County Code regulation adopted for the purpose of avoiding or mitigating an environmental effect?

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

3. Physically divide an established community? X

The project will not include any element that will physically divide an established community.

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4. Have a potentially significant growth inducing effect, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

pact	Incorporation	No Impact	Not Applicable	
	<u></u>	X		

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

5. Displace substantial numbers of people, or amount of existing housing, necessitating the construction of replacement housing elsewhere?

_____X

The proposed project is a grading project and does not affect housing or displacement of people.

M. Non-Local Approvals

Does the project require approval of federal, state, or regional agencies?

Yes X No

Yes No X

No X

No X

Yes

Yes

Yes ____ No _X

The proposed project may need an approval from the California Department of Fish and Games as well as a Construction Activities Storm Water General NPDES Permit from the State Water Resources Control Board.

N. Mandatory Findings of Significance

- 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, animal, or natural community, or eliminate important examples of the major periods of California history or prehistory?
- 2. Does the project have the potential to achieve short term, to the disadvantage of long term environmental goals? (A short term impact on the environment is one which occurs in a relatively brief, definitive period of time while long term impacts endure well into the future)
- 3. 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, and the effects of reasonably foreseeable future projects which have entered the Environmental Review stage)?
- 4. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

TECHNICAL REVIEW CHECKLIST

	REQUIRED	COMPLETED*	<u>N/A</u>
Agricultural Policy Advisory Commission (APAC) Review			_X_
Archaeological Review			_X
Biotic Report/Assessment			<u>X</u>
Geologic Hazards Assessment (GHA)			
Geologic Report			_X
Geotechnical (Soils) Report		X	
Riparian Pre-Site			
Septic Lot Check			
Other:			

*Attach summary and recommendation from completed reviews

List any other technical reports or information sources used in preparation of this initial study:

- Geotechnical Investigation prepared by GeoForensics Inc., dated May 15, 2007 with May 22, 2008 Geotechnical Response Letter.
- Grading, Drainage and Erosion Control Plans prepared by Bowman and Williams, dated January 29, 2008 (revised September 11, 2008), sheets C1.0, C1.1, C2.0, C2.1, C3.0, C4.0.
- Replanting Plan by Hoffman and Associates, Sheet 1 of 1.

ENVIRONMENTAL REVIEW ACTION

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.

X 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 the mitigation measures described below have been added to the project. A MITIGATED NEGATIVE DECLARATION will be prepared.

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

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Matt Johnston For: Claudia Slater Environmental Coordinator

Attachments:

- 1. Project Maps
- 2. Grading, Drainage and Erosion Control Plans prepared by Bowman and Williams, dated January 29, 2008 (revised September 11, 2008), sheets C1.0, C1.1, C2.0, C2.1, C3.0, C4.0
- 3. Geotechnical Report Review Letter prepared by Kent Edler, Senior Civil Engineer and Joseph Hanna, County Geologist, dated July 28, 2008
- 4. Geotechnical Investigation prepared by GeoForensics dated May 15, 2007 with May 22, 2008 Geotechnical Response Letter.
- 5. Application 08-0397 Approval





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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

July 28, 2008

Pete and Haruyo Pearson 101 Benedict Ave. Santa Cruz, CA, 95065

Subject: Review of Geotechnical Response by GeoForensics, Inc. Dated May 22, 2008 and Response Letter by G.E. Weber Dated May 16, 2008 Application No. 08-0106; Assessor's Parcel No: 102-121-34, -37, -70

Dear Applicant:

We have reviewed the subject responses from your consultants and can accept their findings. The following information must be included in the next submittal of plans:

- 1. The grading plans must indicate how the edges of the existing fill will be dealt with prior to bringing in the new fill soil.
- 2. The soils engineer will need to provide approval of all drainage discharge locations, so that drainage is released in a manner not to cause erosion. It is recommended to design the drainage system with a detention type system, so that drainage flow can be metered and controlled to decrease the possibility of erosion at the outlets.
- 3. The plans must provide for cleanouts for sub-drains and outlets.
- 4. The soils engineer must provide continuous inspection of the grading operations.

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

Please contact me at (831) 454-3168 or <u>kent.edler@co.santa-cruz.ca.us</u>, or Joe Hanna at (831)-454-3175 should you have further questions about the processing of your application.

Sincerely,

Kent Edler

Senior Civil Engineer

Cc: Bowman and Williams GeoForensics G.E. Weber Richard Emigh

seph Hanna county Geologist

Environment	al Review Inital Study
ATTACHMENT	3
APPLICATION	08-0106

GEOFORENSICS INC.

561 Pilgrim Dr., Suite D, Foster City, California 94404

Consulting Soil Engineering

Phone: (650) 349-3369 Fax: (650) 571-1878

File: 203205 May 22, 2008

Mr. and Mrs. Pearson 101 Benedict Avenue Santa Cruz, CA 95065

Subject:

Pearson Property 101 Benedict Avenue Santa Cruz, California GEOTECHNICAL RESPONSE

Dear Mr. and Mrs. Pearson:

This letter has been prepared to respond to several issues raised by the County of Santa Cruz during their review of the swale erosion mitigation project proposed for the southern side of your property. The County comments were presented to you in a letter dated April 10, 2008. Our responses to the comments in that letter will follow the same numbering system used in that letter so as to avoid repeating the comments in this letter.

Erosion and Hydrology Comments

1 - Extent of the Erosion - We have again consulted with G. Weber, CEG regarding the historic erosion of the ravine system. His letter (dated 5/16/08) is attached to this letter. In general, Mr. Weber concludes that it is not possible to establish the base line rate of erosion of the ravine based upon aerial photographs due to the coverage of the area by large trees. Despite the lack of visibility in the long term photographs, a walk through of the ravine area to the west of the ravine to be repaired indicated that erosion is currently occurring in the channel downstream of the proposed repair area. Mr. Weber notes that the incising of the channel, and attendant side slope failures, were present along the ravine even in the earliest photographs, which pre-date the Santa Cruz Garden subdivision construction (early 1960's). Hence, it is clear that the process of stream channel downcutting through erosion processes was occurring prior to the subdivision's diversion of water. Unfortunately, the rate of erosion cannot be reasonably determined. During our site reconnaissance evaluations of the downstream areas over the past 4 years, we have noted that the vast majority of the slope failures along the ravine are associated with concentrated discharges of storm waters near the tops and middle areas of the ravine banks. Only very localized areas of slope bank were observed to have failed due to undercutting or other non-manmade factors.

After the construction of the Santa Cruz Gardens subdivision, fill materials were placed in the upper reaches of the drainage ravine. This would have increased the average slope of the flow path within the ravine, causing an increase in flow velocity. An increase in the speed of the water will result in an increase in the water's erosive power. Coupled with fill materials of questionable quality in the ravine from the subdivision, the erosion rates in the upper reaches of the ravine are expected to have increased dramatically. This is clearly demonstrated by the lack of any eroded channel in this area

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in the earliest photographs, as compared to the 10 to 12 foot deep eroded channel current present at the site. Along with the downcutting of the toe of the fill and natural bank deposits, there has been significant slope failures along the margins of the ravine in this area.

It is this documented change in erosion in the upper reaches of the ravine that the current repair plans are attempting to mitigate. The proposed erosion control measures do not intend to rectify any erosional issues downstream of the proposed repair area. However, there will be a reduction in exit velocity of the collected storm waters as a result of the project design, and that reduced velocity should result in a reduced erosion rate in areas downstream of the repair area.

Our office has recently consulted with the project civil engineer to design an outfall structure which will minimize the potential for discharging flows from the storm water system causing erosion to the toe area (and hence downstream areas) of the ravine channel. Specifically, we have recommended that an energy dissipation system consisting of rock-filled gabbion baskets be used to permit low flows to percolate gently through the baskets into the stream channel, and to break up high flows into a bubbling overflow during periods of high flow.

2 - Long-term Channel Stability - The channel downstream of the repair area was documented by the geologic review of the historic aerial photographs to have been eroding prior to the rediversion of water from the subdivision construction (Weber, 5/16/2008). The photographs also indicated that there were failures along the sides of the ravine present prior to the subdivision. Even without the increased waters which are now diverted into the ravine system, it would not be possible to prevent all such events in the future.

Of import, is that the vast majority of the side slope failures which have been occurring downstream of the repair area can be seen to have been caused by storm water discharge on the upper portions of the slope, and not by toe cutting at the base of the ravine. Therefore, even if no water as permitted to flow down this ravine, side slope failures would continue to occur. The anticipated reduction in flow velocity (and hence channel erosion) which is projected from the proposed repairs should help to reduce the limited number of small bank failures we have noted along the downstream reaches of the ravine.

In the area of repair, there will be no future failures of the side banks due to erosion, and mitigative measures along the crest of the new fills should also limit the potential for slope failures due to crest saturation. The elimination of this past failure mechanism will result in substantially less sediment loads in the ravine which are then washed further downstream to be deposited in the flatter areas of the watershed, or result in turbidity of the downstream waters.

3 - Detention or Retention - Due to the very steep nature of the ravine area, we do not recommend that storm waters be retained (held on site), as excess percolation of water into the new engineered fills would tend to cause instability of the fills, and the potential for massive failures of the repair area.

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Similarly, as current detention (slow timed release) systems are designed to detain a certain "event" storm (e.g. 50 year storm, etc.), any storm in excess of the design storm is likely to generate overflows of the system. Such overflows are likely to be highly destructive in such a steep environment.

In evaluation of the proposed system, we have worked with the civil engineer to attempt to provide some degree of detention (slowed release) for peak storm flows. However, attendant with a more complicated design comes increased maintenance requirements, which are often associated with an increase in failure due to lack of maintenance. It had been our desire to provide as maintenance free as system as possible to ensure the best long term performance.

Assessing Historic Grading Comments

4 - Southeast Hillslope - The grading for the mid-1960's development of the Santa Cruz Gardens subdivision included the grading of several terraced lots along the northern side of Cabrillo Avenue. As identified by Mr. Weber, these graded pads were predominantly cut into bedrock materials (this was confirmed during our conversations with another geotechnical engineer, Wayne Ferree, during the lawsuit, as he had access to the crawl space area of some of the subject homes). While we do believe that some fills were pushed over the edge of the ravine, we do not find any evidence in the aerial photographic log to believe that the fills in this area were installed to address an existing geomorphic problem, we instead believe that the fills were placed to create properties with marketable rear yard areas.

During our site reconnaissance inspections of the slope failures along the southeastern margins of the ravine, we found that the vast majority of the failed banks exposed in-place Purisima Formation sands and gravels. These lightly to moderately cemented materials have been standing at nearly vertical inclinations for the past 4 years. Hence, it is our opinion that providing a buttress of new fills to support the downslope faces of these existing materials will result in a very stable slope configuration. It is our intent during grading to have any remaining minor fills on the faces of these slopes incorporated into the new engineered fills. However, we do not intend to cross into the adjacent properties to chase any fills which may extend beyond the property line limits.

5 - Northwest Hillslope - Portions of the Benedict roadway fill do appear to have been engineered. These engineered fill materials typically occur towards the northern (upstream) end of the roadway. Observation of these fills indicates that they have been historically stable, even at inclinations somewhat steeper than 2:1. The presence of these original fills was delineated on our original site map (see our 5/15/07 report, Figure 3) based upon the change in slope grade at the base of the fills.

Conversely, there is evidence that additional fills were "scabbed" onto the original fills at the western bend in the driveway (near the cross road drain pipe) at a later date (but prior to the Pearson purchase of the lot). The location of these fills was also depicted by geomorphic expression on our original site map. These newer fills do not appear to have been properly compacted, keyed, benched, or drained. As a direct result of the poor placement of those materials, they failed into the ravine about

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2 years ago during a period of heavy rainfall. Evaluation of the exposed slide scarp indicated that the majority of these materials were involved in the landslide, with the headscarp exposing the better quality, horizontally layered fills from the original roadway development.

The proposed regarding work will include the reconstruction of those old scab fills as new engineered fill which will be keyed, benched, and drained where it locks into the original native materials below the fill, and into the well compacted original fills.

Project Design Comments

6 - Geotechnical Investigation - Due to the numerous slide exposures on the subject site, we have been able to clearly evaluate large exposures of the hillside materials, both on the southeast, and northwestern sides of the ravine. Further, historic aerial photographic review has assisted in the delineation of the native and fill materials across the proposed repair areas. Based upon the knowledge provided by the large slope exposures and historical photographic record, we do not believe that further subsurface investigation to delineate precise limits of fills at the site is warranted, or will provide any further insight into the project site conditions.

As noted in the plans, the small amount of anticipated fills on the southeastern side of the canyon will likely be removed as part of the grading work as the new fills are placed. Any remaining fills will be of limited extent, and no fills which extend beyond the property boundaries will be removed. The resulting engineered fill buttress will be of sufficient thickness to provide lateral support for any remaining fills within the back yards of the houses along Cabrillo Avenue.

On the northwestern side of the ravine, the poorly placed newer fills will be removed and replaced (most of these have been lost in the slide down the slope two years ago). New engineered fills will be keyed and benched through all the scabbed fill into either native competent soil/bedrock, or into the original roadway fills, which have been demonstrated to have good stability. Portions of the original roadway fill slopes towards the northern end of Benedict Drive that are not within the limits of the proposed new fills will be trimmed back to an even more stable 2:1 slope, commensurate with current grading standards.

7 - Channel Design - The flow line on the top of the new engineered fills must be protected from erosion. We have recommended that a surfacing of rip-rap be used to slow the flows of water, thereby reducing the potential for erosion. Further, the rip-rap will tend to be "self healing" with blocks falling into any erosion scars which may develop. Conversely, we have found that concrete or asphalt lined channels will often become partially blocked, causing waters to jump out of the channel and cause erosion along the margins of the channel. Even after the obstruction is removed, these side rills will continue to grow, and are nearly impossible to effectively recompact with light hand-held equipment which can be transported to any repair area. Therefore, we strongly recommend against any inflexible lining of this channel. If desired/necessary, a catch basin with collection pipe can be installed at the break in slope (4 percent to 26 percent area) to limit the amount of water which will be able to flow down this steeper slope.

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8 - Maintenance of the Improvements - This is not a geotechnical issue. The civil engineer should address the methods and personnel responsible for maintenance of the new system to convey the County's storm waters through this project.

9 - Hydraulic Design - Again, not a geotechnical issue. The civil engineer is to address this issue.

Compliance Comments

1 - Other Design Issues - These comments are generally not related to geotechnical aspects of the project. However, Comment 1d, regarding the depiction of keys and benches on the typical cross sections (sheets C2.1 and C2.2) does cross over into the geotechnical realm. From our experience, the key and bench locations must be field determined based upon exposed ground conditions as the project is constructed. Any key or bench locations depicted on the plans will be schematic at best, and unlikely to be appropriate to install during construction. For fill quantity estimations, we would suggest that a thickness of inappropriate materials (ie. depth of over-excavation) of 10 feet be assumed for the center line areas of the existing ravine, with average side slope over-cuts on the order of 5 feet below existing grades.

Miscellaneous Comments / Conditions of Approval

1 - Connection with Existing Culvert - We would recommend that the connection between old and new culvert be made in a manhole so as to permit the best connection between potentially dissimilar material types. This will also allow for access to this junction in case of problems. We do <u>not</u> recommend draining any subsurface waters into this junction, as any back up of the system (such as may occur during peak flow detentions) may result in back up of storm waters into the subdrain system, causing saturation of the hillside. Instead, we recommend that a perforated pipe be installed in the gravel section under/around the base of the new manhole to collect any water chasing the old pipeline system. This perforated pipe should then tie into the perforated collection system proposed to be installed along the base of the cleared out old drainage swale. A *capped* access to this drain may be provided inside the manhole.

2 - Proposed Dissipater - We agree that the dissipater should be located at the base of the rock riprap faced slope. This will allow the discharged water to most gently be distributed into the downstream channel. Large rock rip rap (which will again be self healing) should be extended a minimum of 10 feet downstream of the dissipater discharge point. We have worked with the project civil engineer to design a gabbion basket system of dissipation in order to provide a high quality energy reduction system at the discharge location.

3 - Riprap Energy Dissipater - The axial subdrain can be daylighted above the energy dissipater to keep it out of the discharge location from the main storm drain system. However, we note that this outfall will likely never discharge water, as the water collected in the subdrain system will flow out of the perforated pipe and into the gravel backfill thence to the rock rip rap before reaching the outfall end of the pipe. This is desirable, as any clogging of the end of the pipe (slide debris, kids, etc.) will not cause water to back up in the axial subdrain system.

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4 - Biotic and Riparian Issues - Not geotechnical issues

5 - Plan Review Letter - We will complete a geotechnical review of the plans once they are finalized.

DPW Drainage Comments

With respect to the geotechnical aspects, these comments are generally duplicative of the comments above.

Should you have any questions please contact the undersigned.

Respectfully Submitted;

GeoForensics, Inc.

Daniel F. Dyckman, PE, GE Senior Geotechnical Engineer, GE 2145

cc: 4 to addressee

Environmental Review Inital Study ATTACHMENT_ **APPLICATION**

G.E. WEBER GEOLOGIC CONSULTANT

129 Jewell Street, Santa Cruz, CA 95060 831. 469. 7211 831. 469. 3467 Fax

May 16, 2008

Mr. Dan Dyckman Geoforensics, Inc. 561-A Pilgrim Drive Foster City, California 94404

Subject: Response to County's Comments - letter of 4-10-08

Dear Dan:

Enclosed is a brief letter report addressing several of the issues raised by the Santa Cruz County Planning Department staff in the above referenced letter. The issues addressed include examination of aerial photographs, the extent of the erosion in the ravine, and the nature of the fill on both the northwest and the southeast sides of the ravine.

The results of this review of data indicate: 1) the homes along Cabrillo Avenue are built on native soils and not on either fill or old landslide deposits, 2) extensive tree cover and relatively low photographic resolution make it essentially impossible to determine the exact amount of erosion that has occurred over the years, 3) therefore estimates regarding erosion are based largely on my field examinations of the property over the past 4 years, 4) the fill prism along Benedict Avenue is non engineered, and 5) the extent of the fill prism along Benedict Avenue is adequately delineated in the proposed repair area on the Geoforensics Map of 5-15-07.

If you have any questions regarding this report please contact me.

Sincerely,

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Gerald E. Weber, Ph.D. RG #714 CEG # 1495





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G.E. WEBER GEOLOGIC CONSULTANT

129 Jewell Street, Santa Cruz, CA95060831. 469. 7211831. 469. 3467 Fax

History of Natural and Man-Made Changes in a Small Ravine on the Pearson Property, Santa Cruz Gardens Area Santa Cruz County, California

Introduction

This letter report has been prepared to provide additional geologic information regarding the geologic conditions on the Pearson property at the site of the proposed repair. It is in response to requests for additional data from the County Planning Department. Specifically, I am providing information on the following topics requested in Kent Edler's letter of April 10, 2008:

Page 1, Erosion and Hydrology; 1. Extent of Erosion Page 2, Assessment of Historic Grading; 4. Southeast Hillslope & 5. Northwest Hillslope

My reconstruction of the erosional history (and the urbanization) of this area is based primarily on the interpretation of stereo-pair aerial photographs taken over the past 60 plus years. All photographs are available for viewing at the Map Room housed in the Science Library at UCSC. Historical information has also been obtained from, 1) a variety of documents generated by the original lawsuit, including reports and declarations; 2) documents available through the Santa Cruz County Department of Public Works and Planning Department; 3) basic geomorphology and engineering geology textbooks, published geologic and topographic maps; and 4) field work conducted over the past four years.

Geographic and Geologic Setting

The geologic setting of the area is relatively simple. Nearly flat lying, moderately consolidated sandstones and siltstones of the Pliocene Purisima Formation comprise "bedrock." These are overlain by a thin layer of stream and marine terrace deposits. Although fill was placed on some of the lots along Cabrillo Avenue (southeast of the ravine) there is no evidence that fill still lies on top of the terrace deposits on these properties along Cabrillo Avenue. Non-engineered fill is clearly present along Benedict Road on the northwest side of the ravine.

The ravine in question drains a small portion of the third emergent marine terrace that lies between Rodeo Gulch Creek and Arana Gulch in Santa Cruz County. The stream is intermittent and flows toward the South-Southwest. The ravine is between 20 - 30 feet deep near its head at Benedict Avenue, deepening progressively as one goes down stream. The side slopes are steep, ranging from vertical, in the scarps formed by the recent slope failures, to about 70-80% in the area of the proposed repair. Slopes in the ravine are densely forested by a mature grove of eucalyptus trees, along with a variety of shrubs, trees and grasses. Downed trees are jack-strawed across the bottom of the drainage in the proposed repair area, which in combination with landslide deposits completely obscure the channel. During field work it became clear that the trees and landslide deposits had bridged the channel and the stream was flowing at depth below the surface that I was standing on.

Despite the heavy vegetative cover, it is apparent that there has been accelerated erosional deepening of the channel in the ravine. Along the northwest side of the ravine mature eucalyptus trees have had the soil eroded out from under their root systems, and many trees have fallen - apparently as a result of under-cutting by the creek.

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An extensive fill prism is present on the west side of the ravine. It was largely placed during the grading of Benedict Avenue; although some was probably side cast into the area during the grading for the playing field of the elementary school. The outboard portion of that fill prism adjacent to Benedict Avenue is clearly non-engineered fill. Several small debris slide scars are present on the face of the fill slope. The slide deposits are distributed across the slopes below the scars and in the bottom of the creek. In December of 2005 the head scarp of a recent landslide exposed a thick section of old, poorly consolidated, non-engineered fill, portions of which are at least 15 feet thick.

A fill prism was placed on the southeast side of the ravine in the 1960's during the construction of homes along Cabrillo Avenue. It appears that this entire fill has incrementally failed and slid into the ravine over the past 35 + years, as the materials exposed in the scarps are native soils and sediments. The erosion and formation of small landslides on the slopes behind these homes along Cabrillo Avenue has been exacerbated by the disposal by the home owners of much of their surface and roof drainage (along with yard cuttings, soils and some junk) into the ravine on the Pearson property.

Hydrologic Changes

During construction of Santa Cruz Gardens the drainage basin for the ravine in question was drastically changed. It is clear from both aerial photographs and the subdivision maps that the drainage basin was greatly enlarged. The street and roof drainage for approximately 40 homes in the Santa Cruz Gardens subdivision and most of the drainage from the Elementary School is conducted into the head of the ravine on the Pearson property through a 24 inch culvert. This resulted in a great increase in average discharge and increased the peak runoff. It is this increase in the volume and velocity of stream flow during storms that has deepened the stream channel, undermined trees and cut away the toe of the fill slope, which in turn has triggered the landslides.

Preliminary calculations by Dr. James Schaaf (Schaaf and Wheeler, Consulting Civil Engineers) indicate the following:

- 1) Drainage area has increased from 5 acres to 17 acres, approximately a three fold increase.
- 2) Taking into consideration the increase in drainage area and the effects of urbanization on stream flow the flow of the stream has changes as follows: 1) on the average, flow in the ravine has increased by a factor of 13 due to these changes; 2) the potential for erosion has increased by a factor of 86. This, however, does not tell the whole story. For example during the 1994 95 rainy season, a high rainfall year, the volume of flow was 20 times greater than it would have been under natural conditions; and the potential for erosion was 500 times greater than it would have been under normal conditions.

Note: Any errors that might exist in the above calculations by Dr, Schaaf are unquestionably due to my misunderstanding of Dr. Schaaf's comments during our phone conversation.

Comment on resolution of aerial photography and vegetation

The County's letter of 4-10-08 requests an aerial photo examination to observe the baseline erosion and the change in erosion rate after the diversion of the stream from its original location. Having looked at all of the available aerial photos I can state with certainty that this can only be done in a roughly "qualitative manner". There is no way that it can be done in a "quantitative fashion."

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- First: The photographic grain and the scale of the aerial photos makes it impossible to resolve features less than about 5 8 feet across except under very favorable lighting conditions.
- Second: Even if the grain and scale were better the area of interest lies in the middle of a deep ravine that is surrounded by trees. Prior to about 1965-70 the uppermost portion of the ravine was visible on the aerial photographs. After that time the area is simply not visible. Consequently, the area of interest is not visible on any of the photos taken during the time that the majority of the erosion and landsliding took place. A combination of the tree canopy and the shadow cast by the trees essentially covers the entire area of interest. The erosional channel itself is never really visible in any of the photos in an area of interest.

RESPONSE TO: Erosion and Hydrology; 1. Extent of Erosion

Review of Aerial Photographs

In this discussion of the changes in the area I will use these terms:

"Ravine" - refers to for the small drainage that lies between the homes on Cabrillo Avenue and the Pearson home. It is the site of the proposed repair.

"Repair area" - The area slated for repair.

"Stream terrace" - refers to a narrow terrace on the southeast side of the ravine below the area where the repair will take place.

"Benedict fill" - the fill along Benedict Road on the northwest side of the ravine.

"Cabrillo fill" - fill behind the homes on Cabrillo Avenue.

October 5, 1943: Scale 1: 20,000 Photo #'s CJA 1B 06,07

The present day location of the Santa Cruz Gardens subdivision and the Elementary School is an elevated marine terrace consisting of open grassland. Most of the ravine is vegetated with a relatively dense cover of trees obscuring the channel. Tree cover is not present in the uppermost portion of the ravine on the present day Pearson property. The ravine is grass covered and there is no indication of a stream channel in the area of the proposed repair. At the southwest end of the ravine (well below the area of present landslide activity) a low narrow stream terrace is clearly visible in the ravine. The stream is incised into this surface about 20 feet. A narrow road is visible on the terrace on the southeast side of the ravine. This road is present today and is in remarkably good shape over most of its length. Trees obscure the channel and the road in most of the area of present day landsliding. It appears that the road extends to the top of the ravine. A dark shadow on the photograph lies along the east side of the ravine near the base of the slope. This is either a cut for the road or a steep slope at the base of the slope. It is impossible to determine if the shadow is a small channel eroded into the existing valley floor. In the upper portion of the ravine (above the area of present landsliding) there appears to be no indication of incision into the floor of the ravine.

Examination of other stream valleys and ravines in the general vicinity reveals that all of them show evidence of a higher valley floor (stream terrace) that has been incised by the present day streams. The reason for this can only be speculated on, but is probably the result of a combination of sea level changes during the last Pleistocene glaciation and slow continental uplift.

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The slopes on both sides of the ravine show evidence of previous slope instability. Small scoopshaped scars on the hill slopes are probably the result of shallow debris slides, debris flows, and slumps that formed in the marine terrace deposits. There is no indication of "slump blocks" only slide scars in the "repair area." There are no homes or other roads present in the area.

April 25, 1948: Scale 1: 20,000 Photo #'s CDF 5-3 14, 15

Essentially identical conditions when compared to the 1943 photos. No obvious signs of recent landsliding. Road visible along southeast side of ravine, and appears to extend to the top of the terrace. No sign of gullying or incision in the ravine above the tree line.

June 2, 1956: Scale: \approx 1: 10,000 Photo #'s CJA-2R 82, 83

Area remains undeveloped. Open grassland. No changes in the ravine.

First Summary:

The only man-made changes to this area over the previous 13+ years are a road graded on the stream terrace, that extends up to the top of the marine terrace; the planting of the eucalyptus trees and the effects of grazing. Changes in geomorphic processes operating in the area have been minimal.

Shallow landsliding appears to be an ongoing process on the slopes on both sides of the ravine; and the ephemeral stream has been incising its channel into its former valley floor creating a stream terrace. It is probable that the incision of the channel into the floor of the valley has been migrating upstream, thereby extending the area of incision up canyon. The channel floor lies over 20 feet below the road on the stream terrace.

June 24, 1963: Scale: ≈ 1: 10,000 Photo #'s CJA-1DD 110, 111

The Santa Cruz Gardens subdivision is under construction. The Southern portion of the tract appears to be almost complete, and all of the major roads are completed. However, six of the homes along the northwest side of Cabrillo Avenue that back onto the ravine are not yet under construction. South of Benedict Lane, the first home 443 Cabrillo Ave is present, but 403, 347, 343, 339, 335, and 331 have not yet been built. Construction and grading for the elementary school has not yet commenced. Grading of the area where the six homes are to be built appears to be either complete or nearly complete. During grading a large number of trees were removed from the original stand that filled the upper portion of the ravine. In addition a large amount of fill has been pushed into the drainage. It is impossible to tell how thick the fill is or whether it was adequately engineered. The graded home sites consist of two benches separated by a small vertical step, with the step facing northwest - toward the ravine. The fill placed in the ravine forms a slope that reaches the bottom of the ravine; and that fill has moved the centerline of the stream to the northwest - away from the properties on Cabrillo Avenue toward what will eventually be Benedict Lane.

A strange shadow is present at the base of the southeast side of the ravine directly behind 343, 339, and 335 Cabrillo Avenue. The size of the shadow (when compared to the shadows cast by the existing homes) appears to be a vertical face on the order of 8 feet high at the base of the fill slope. I do not know what this feature represents, but it may be a near vertical cut at the base of the fill along a road in the bottom of the ravine. It is possible that it is a road perhaps graded to allow equipment access for the fill placement.

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There is no development on the northwest side of the ravine. However there appears to be a narrow bench along the northwest side, which may be an old road. The uppermost part of the ravine (the area now filled during the construction of the school) shows no indication of an incised channel.

There appear to be no recent landslides in the ravine. However, it appears that a significant amount of sediment has entered the ravine and has been moved down channel (perhaps by the ephemeral stream and/or by grading). This has unquestionably altered the gradient of the stream.

Second Summary:

The first major alteration to the ravine occurs during the initial grading. A double bench is cut into the top of the slope and the Cabrillo fill is placed in the ravine. This partially fills the drainage and diverts the stream to the northwest. This changes dramatically the nature of the drainage. The drainage is partially filled with earth materials and probably organic material and debris. The floor of the ravine is raised in its upper reaches creating an area of steeper slope (knick point) The knick point will increase the velocity of flow which in turn will accelerate erosion in the fill, and the movement of the knick point upstream.

June 13, 1968: Scale: ≈ 1: 13,000 Photo #'s GSVBZK 2-58, 2-59

The Santa Cruz Garden's subdivision is almost complete. However, the six homes noted above, that lie southeast of the ravine have not yet been built. Santa Cruz Gardens Elementary School has been built and the grading of the playing fields is completed, along with the construction of the "outfall" for the runoff from the subdivision. The graded benches (future home sites) are not vegetated, but the step between the benches and the fill slope appear to be heavily rilled. Benedict Lane has not yet been graded into the hillside northwest of the ravine. The shadow that looks like a vertical cut along the base of the fill slope is still evident.

The stream in the head of the ravine (which is now receiving greatly increased runoff through the 24 inch culvert) appears to be incised. (This is what one would expect.) Areas of light colored tonal pattern in the bottom of the ravine suggest that sediment is being eroded into the ravine, probably from the "Cabrillo fill" and elsewhere in the subdivision. Almost certainly some of the sediment is derived from the grading done for the school; and some may be the result of incision by the stream. There is enough resolution in the photographs to suggest that there is a large vertical step in the stream channel (probably 10 feet \pm) at about the downstream edge of what will be the repair area.

A possible recent landslide scar may lie behind 327 Cabrillo Avenue, and a small landslide scar may be present on the northwest side of the ravine on the edge of the school playing field.

April 11, 1973: Scale: 1: 15,846 Photo #'s 7-4, 7-5

Western portion of subdivision is complete. Benedict Lane has been graded. The Pearson home has not yet been built. Construction of Benedict lane has created a large fill prism at the head of the ravine and along the outer edge (southeast) of the road. It appears that a small slide mass has originated in this fill prism near the head of the ravine.

High reflectivity in the center of the ravine suggests erosion and or deposition has recently occurred in the drainage. It is impossible to determine anything regarding the depth of an Environmental Review Inital Stue

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erosional channel. A strange sinuous shape lies above the base of the fill on the southeast slope behind 343, 339, and 335 Cabrillo Avenue. It is impossible to determine exactly what it is. However, it appears to be a near vertical cut or wall that is probably part of a road/trail or perhaps a retaining structure.

The home at 325 Cabrillo Avenue appears to have a recent slide scar in the back yard.

Third Summary:

The homes along Cabrillo Avenue are now completed. Benedict Lane has been graded, and it appears that the inner (northwest) portion of the road is on cut, while the outside (southeast) portion clearly is a fill prism. Based on my examination of the main scarp of the December 2005 landslide, the fill is composed of a variety of earth materials and contains abundant construction debris, organic material and trash. Clearly this fill has not been adequately engineered. It is unstable and will eventually be affected by landsliding. The fill has buried eucalyptus trees and raised the floor of the stream valley, assuring that the slopes will be undercut by the stream.

October 14, 1975: Scale: 1: 12,000 Photo #'s 1-36, 1-37

No major changes in the area; similar to 1973. Vegetation is now exceedingly thick and the tree canopy completely obscures the ravine. A small landslide has formed either in the Benedict Lane fill or the slide has originated on the school property - can't tell for certain. This slide is directly across from 339 Cabrillo Avenue. Photos are difficult to interpret because of shadows created by a low sun angle.

April 11, 1980: Scale: greater than ≈ 1:40,000 Photo #'s 179-55, 179-56

Scale is too small to be very useful. However, the photos show that the Pearson house has been built. They presence of a light tonal pattern along the northwest side of Benedict Lane suggests that additional fill has recently been place along Benedict Lane and it appears that the fill prism has been significantly widened. The floor of the ravine is not visible.

April 12, 1985: Scale: ~ 1:40,000 Photo #'s WAC-85 CA 13 -140, 13 - 141

Good sun angle. Both at the Pearson home and along Benedict Lane the light tonal density indicates that recent grading has occurred - along the road and at the home site. The fill prism appears to be at least twice as wide as the road bed of Benedict Lane. Numerous trees have been cut at the home site and along the road over the past 3 years.

June 16, 1989: Scale: 1: 35,000 Photo #'s WAC 89 CA 36-154, 36-155

Fill prism again appears to be at least twice as wide as Benedict Lane on the average, and in some places considerably wider. Trees completely obscure the ravine.

October 18, 1989: Scale: 1:12,000 Photo #'s AV 3662 1-6, 1-7

Clearly, the fill prism is twice as wide as the road bed of Benedict Lane. Few if any changes have occurred between 1985 - 1989. Trees completely obscure the ravine.

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May 14, 1990: Scale: 1: 15,840 Photo #'s WAC SANTA CRUZ - 90 9-141, 9-142

Color photos, with good sun angle and scale. Parking area is wide - approximately 2 ¹/₂ times road width at a maximum. It appears that a small debris avalanche or slide chute is present on the Pearson property near the parking area, and a small slide may have occurred off of the home site southwest of the Pearson property on Benedict lane. Recent landslides appear to have occurred behind homes along Cabrillo Avenue. No evidence of recent dumping of fill. The center of the ravine is once again completely obscured by the tree canopy.

Fourth Summary:

The fill prism along Benedict Lane has not changed significantly in the past 5 years (since about 1985). This suggests that the amount of fill placed since 1985 was relatively minor. The floor of the ravine is completely obscured.

June 22, 1994: Scale: 1: 15,840 Big Creek Lumber 13-4, 13-5

It appears there is a small change in the parking area, and that a bit more fill has been added to Benedict Lane. Light tonal area in the bottom of the ravine indicates that sediment and debris has moved into the center of the ravine from either behind the homes along Cabrillo Avenue, or perhaps from the Benedict Lane area. One tree has been cut down near the Benedict Lane parking area. Debris may have slid into ravine from an area near Pearson's swimming pool - it's difficult to tell. Possibly a couple of debris avalanche scars are present at the northeast end of the parking area along Benedict Lane.

September 20, 1997: Scale: 1: 24,000 Photo #'s WAC-97CA 14-257, 14-258

Very little change, if any, except for the tree canopy, which obscures more and more of the area. No indication of an addition of large amounts of fill to the Benedict lane fill prism.

June 26 & 27, 2003:

AMBAG 316-03, 316 -04 & 206 -02, 206-03

Large scale color photographs with excellent resolution. Fill prism is essentially unchanged. Any additions of fill between 1998 and 2003 were minor.

Summation:

The area was originally open grass land with a eucalyptus grove in the ravine. The ravine had experienced down-cutting or incision prior to the development of Santa Cruz Gardens but not in the uppermost reaches. The incision was probably in response to a combination of sea-level fluctuations and tectonic uplift. Land-use changes associated with grazing, burning of the coastal grass lands by the Indians, logging, etc. may also have contributed to the erosion. It is impossible to sort these out and it is irrelevant to the proposed repair. A farm road (dirt trail) existed in the ravine built partially on the remnant of the old valley floor (the stream terrace). There is clear evidence that the east side of the ravine had experienced small shallow debris slides in the past.

The construction of homes along Cabrillo Avenue and the construction of Santa Cruz Gardens in general altered the hydrology. The homes along Cabrillo Avenue were built on a fill prism that was built out into the ravine, displacing the stream to the west and raising the floor of the ravine. This was followed by the construction of the elementary school and the construction of Benedict

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Avenue, which resulted in fill being placed on the west side of the ravine and apparently some additional filling of the ravine. This was followed by accelerated erosion from the stream which deepened the ravine, eroded away the toe of the fill prism and apparently triggered the landslides that have resulted in vertical slopes behind the homes along Cabrillo Avenue. As early as 1973 - 75 it appears that small landslides were occurring on the east side of the ravine. In the early 1990's there is evidence of additional landslide activity behind homes on the east side of the drainage. In a similar fashion small landslides have occurred on the west side of the ravine.

Although we can reconstruct the history of changes in the area that resulted in the landsliding in to the ravine it is far more difficult to estimate the size of erosional changes in the ravine. Based on what I can glean from the aerial photos and approximately 8 field visits to the ravine to collect information I would propose the following scenario for the erosional history.

Before Construction of Santa Cruz Gardens

The ravine was experiencing a long period (thousands of years) of erosion to the following. First, sea-level has been essentially stable following its rise to its present position within the past 4,000 - 5,000 years. This stable sea-level when combined with slow uplift of the Santa Cruz Mountains (about 1 foot per thousand years) resulted in the stream down-cutting into the valley floor. As the down-cutting continued the "knick point" associated with the down-cutting migrated slowly upstream. However, the terrace with the road is almost certainly older. Prior to the 1960's there is no evidence that the upper portion of the "ravine" (including part of the repair area) had an incised stream channel. Well below the "repair area" there may be a small channel incised into the present valley floor. There was probably a knick point (area of steeper slope) associated with this channel that was slowly migrating upstream.

Post Construction

Over a period of 15 + years construction in and above the head of the ravine completely changed the nature of the ravine. The "repair area" was partly covered with fill and the channel was pushed to the northwest. In addition fill was pushed into the drainage from the northwest. This resulted in a raising of the stream bed, which combined with increased discharge, accelerated the erosion of the fill - and probably some native materials.

My field examination reveals that the channel had eroded down between 6 and perhaps 12 feet in the repair area. However, most of this was in poorly engineered and simple dump fills. The stream also has clearly eroded down into the native materials in several areas, but these are areas where the stream was pushed strongly to the northwest - so it may largely reflect lateral erosion more than a simple deepening. The important aspect of the down-cutting is that it reduced the gradient and has pushed the "present day" stream toward an equilibrium (graded) condition. This suggests that the future erosional potential has been reduced by the down cutting. It's difficult to say much more about the erosional history or to predict the future erosion potential.

Without knowledge of the original condition of the ravine it is impossible to accurately determine how much erosion has occurred, much less where it occurred. Once we move downstream, away from the repair area, the effects of the subdivision caused hydrologic change appear to have been relatively minor. It appears that there may have been about 3 feet of incision of the stream into a "relatively flat old stream bed" in the lower portion of the ravine. This is several hundred yards below the repair area. There is no way of determining how much of this erosion is due to the hydrologic changes associated with the Santa Cruz Gardens subdivision and how much simply reflects the evolution of the channel over the past 5000 years.

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RESPONSE TO:

Assessment of Historic Grading

4. Southeast Hillslope

Based on aerial photo interpretation it appears that the homes along Cabrillo Avenue are built on native materials. The obvious fill prism that was graded into the ravine appears to be restricted to the back yards and the area that originally lay northwest of the back fence. I suspect that the combination of the small northwest facing step and the fill were used by the developer to expand the properties to a size where they were developable.

This is supported by an inspection of the materials that lie above the Purisima Formation where they are exposed in the landslide scars behind the homes. Although the material is crudely bedded, the presence of pebble imbrication and fine grained interbeds indicates that the material exposed in the scars is of stream origin. As the uppermost portions of the deposits are not accessible, and cannot be examined in detail, it is possible that perhaps some fill material is present in this area. However, the amount must be exceedingly small. In addition if such deposits are present they have been placed on stable, well drained fluvial deposits hundreds of thousands of years old.

The aerial photos also show that there are no significant landslide deposits in the area where the homes were built. Small "scoop shaped" scars (associated with landslides) can be clearly seen on the aerial photographs from the 1940's and 50's at the top of the slope along the southwest side of the ravine. Although "scoop shaped" scars are present they represent the erosional scar produced by the slope process - not the slide deposit. The landsliding into the ravine consists almost entirely of small soil and debris avalanches and flows. These types of slides routinely occur in the less well consolidated terrace deposits, with the slide masses falling, tumbling sliding and flowing out into the ravine. Little if any slide material is left at the top of the slope. There is no indication that rotational block landslides were ever present in the area of the "Cabrillo fill." There is no evidence of slide deposits being present at the top of the terrace. Once again, during field inspection, the scarps associated with the most recent landslides clearly expose "in place" Purisima Formation in the lower half of the slopes, and terrace deposits overlying the Purisima Formation. This indicates that the slide masses associated with the scars visible on the aerial photos slid into the ravine and were subsequently eroded away.

The drainage ditch at the top of the slope was part of the original design and its purpose was undoubtedly the protection of the fill area from flow over the edge of the fill. The concept was good but the home owners defeated it by draining roof and yard runoff into drainage systems and then concentrating it on the fill slope, thereby contributing to its eventual failure.

In summation, all of the field data and the aerial photo interpretation indicate that the homes at the top of the southeast hillslope are not built on fill, but on native materials.

5. Northwest Hillslope

The fill along Benedict Avenue is clearly not an engineered fill. The fill contains large amounts of trash, building materials, wood, chunks of concrete, etc. It is not adequately compacted, and it apparently fails readily when saturated. The history of fill placement is clearly long and complex.

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Exactly who placed what, how much and when it was placed is open to question. It is probable that fill was dumped into the ravine during the construction of the school, construction of the road and the homes. The county letter states: "Both permitted and unpermitted grading has occurred..." In the repair area I saw no evidence of what I would call an engineered fill. If some of this fill was permitted, I'd be curious as to why it was permitted and who from the county inspected it.

Based on aerial photo interpretation and field work it is clear that the top of the fill must lie near the middle of the Benedict Avenue, since the cut on the northwest side of Benedict Avenue exposes native materials. The lower edge of the fill is more difficult to delineate but can be approximated over much of the area by a break in slope. In the area of the recent 2005 landslide a combination of fill and landslide debris extend to the center line of the drainage. These boundaries are shown on the Geoforensics Map of 5-15-07. Consequently, we have a reasonably accurate portrayal of the distribution of fill in the repair area that will have to be removed.

Summation:

A combination of aerial photo interpretation and field work indicates that although small landslide scars were present in the area of the "Cabrillo fill" there is no evidence that landslide deposits remain at the site. The homes are built on native materials and the vast majority, if not all of the original fill has failed, slid into the ravine and been removed (or at least partially removed) by erosion. My interpretation is that the exposure of stream terrace deposits overlying Purisima Formation bedrock in the southeast wall of the ravine indicates makes it impossible for landslide deposits to underlie the existing homes and their back yards.

The fill area on the northwest side of the ravine is composed of non-engineered fill. The distribution of the fill as indicated on the Geoforensics map is a reasonably accurate portrayal. The exact boundaries may be off by a few feet, but these variations will be easily detected during the initial stages of the proposed grading for the repair.

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GEOFORENSICS INC.

561 Pilgrim Dr., Suite D, Foster City, California 94404

Consulting Soil Engineering

Phone: (650) 349-3369 Fax: (650) 571-1878

File: 203205 May 15, 2007

Fitzpatrick, Spini & Swanston 838 South Main Street, Suite E Salinas, CA 93901

Attention:

Charles Swanston

Subject:

McCartney, et al. V. Pearson, et al 101 Benedict Avenue Santa Cruz, California PROPOSED SLIDE MITIGATION WORK

Dear Mr. Swanston:

This letter has been prepared to present our recommendations for providing long term stability to the overly steep creek banks which extend from the Pearson property up to the rear of the various plaintiffs properties.

Site Description and Observations

The subject site consists of a large irregularly shaped lot owned by the Pearsons at 101 Benedict Avenue in Santa Cruz. To the southeast of the Pearson lot, several smaller lots have been developed with single family residences which front on the 300 block of Cabrillo Avenue. An elementary school is located to the north of the Pearson property, while other developed residential lots are located to the northeast of the Pearson property.

The topography in the area consists of a deep drainage ravine which runs roughly northeast down to the southwest, subparallel to the common property lines between the plaintiffs' and Pearson properties. The natural side slopes of the ravine slope down from the back of the plaintiff lots on a gradient of approximately 1:1 (45 degrees). Opposing slopes to the northwest of the ravine axis are generally on the order of 1.25:1 or flatter.

The creek runs down through the axis of the ravine. The creek has downcut into the natural soils, resulting in generally low (4 to 8 foot tall) steep to near-vertical side banks directly along the creek axis. Along the axis of the ravine, there are several eucalyptus logs and branches within the flow line of the ravine. The logs are generally cut pieces of tree trunk, not simply fallen trees. The logs and branches extend along nearly 200 feet of the creek alignment before terminating just upstream of a waterfall (steep gradient change in the creek base).

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The upper reaches of the ravine/creek (on the Pearson property) have been filled with soil in the past to provide an access driveway to the main lot. A culvert which extends upstream beyond the limits of the property (and reportedly drains portions of the adjacent subdivision) outlets at the toe of the ravine fill near the northeastern end of the Pearson lot. The pipe consists of a 24 inch diameter concrete culvert.

The grading for the driveway continues along the northwestern side of the ravine, consisting of a conventional cut-fill section (cut into the hill on the upslope side, and fill on the downslope side of the driveway). The limits of the fill were generally observed to extend down the slope banks on the order of 20 to 50 feet from the crest of the fill (see Figure 3). The fill did not extend into the creek at any point, and was generally located at least 10 to 40 feet from the steep creek banks. The location of the toe of the fills was generally apparent as a change in vegetation, and by presence (or lack) of soil build up against tree trunks.

Sloughing is prevalent along the margins of the creek downstream of the waterfall where the nearvertical creek banks are over 10 feet tall. Landsliding is also prevalent both upstream, and downstream of the water fall (see Figure 3). Slide masses tend to be larger and more prolific along the steeper southeastern side slopes of the ravine, than they are on the slightly more gentle northwestern side of the ravine. The age of the slope failures appears to span many decades, with some of the failures on the order of only a couple of years old, while others are overgrown, and indicative of decades of inactivity.

The sliding generally results in most of the failed materials having been deposited along or in the creek. Much of the debris has been washed away over the years. Typically, the landslide scars indicate that the materials which have been liberated off the slope are less than 5 feet thick. This mass "shedding" of the outer face of the bank best describes the visual appearance of these slides. A deeper slide occurred in the winter of 2005/06 along the downslope side of the access road to your lot. This slide included old fill materials which had been placed along the downslope side of the roadway, but the failure does not yet extend up into the road. This slide appears to have been on the order of 5 to 10 feet thick.

Where the slides have occurred, there are good exposures of the native materials. The native materials have been evaluated by several geologists as part of the lawsuit. The geologists generally agree that the materials consist predominantly terrace deposits (lightly cemented sands, silts and gravels) with a small amount of fill at the edges of the buildings pads along the top of the southern ravine bank. Similar materials comprise the northern bank of the creek, but the fill deposits are significantly thicker (up to about 6 feet thick) along some portions of the roadway.

Along the common property line between the Plaintiffs' and Pearson lots, a concrete V-shaped ditch has been installed. The ditch drains from the northeast down to the southwest, where the ditch then discharges through a culvert down to the top of the top of the vertical creek bank. At that location, the dissipater on the end of the culvert has been broken off, and there has been a failure of the creek bank. At the time of our visits, some portions of the V-ditch were filled with debris.

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Several corrugated plastic pipes were observed to penetrate under the rear fences of the Plaintiffs' lots to drain into the V-ditch. Often the ends of the pipes are turned upward to drain over the edge of the concrete ditch. This results in water ponding inside the pipe. Corrugated plastic pipes were also observed to pass by the V-ditch, discharging onto the steep ravine banks. One such pipe was observed to extend out of the face of one of the newer slide scars.

Concrete or other materials have been used to bridge over the concrete V-ditch to provide access from the plaintiff properties into the Pearson lot. These bridges will tend to limit flows through the ditch, particularly when the ditch is filled with debris.

MITIGATION RECOMMENDATIONS

General

The ravine banks are excessively steep in their native state. These slopes should be expected to periodically fail as the exterior face of the slope becomes weathered by time and vegetative growth, and then become saturated by rainfall. Therefore, to repair the existing slide areas only, would be to address only those areas we believe to be currently most stable (although not adequately stable), while allowing the more weathered (less stable) areas to remain unaddressed. Therefore, to provide the best long term stability to the existing failed slopes, as well as the remaining overly steep ravine slopes, we propose to buttress all of the overly steep ravine slopes by the construction of a deep fill within the ravine.

The existing debris-strewn, eroded creek channel will be replaced by an extension of the existing culvert, which will within the new fill to daylight just beyond the base of the waterfall area in the existing creek. A rock rip-rap toe is proposed for the fill to permit the escape of underground water, stabilize the toe of the fill, and to avoid piping failures.

The proposed repair will not only stabilize the entire overly steep ravine slopes, but it will help to limit future sedimentation into the creek environment from continued back-cutting of the waterfall, and elimination of soils liberated in the slope failures.

Site Preparation

Prior to the placement of any fill within the ravine, the affected areas of the side slopes should be stripped of vegetation, existing organic debris, and existing fills. All organic materials, and any of the existing fill deemed to be unacceptable for use as new fill should be removed from the site. Topsoils may be stockpiled for future use on the finished fill. All concrete pieces, loose pipes, and other debris should also be hauled away.

Where trees are to be removed, the trunks will need to be removed as well. Holes created by removal of tree trunks may be repaired by placement of compacted fill as the main engineered fill is placed.

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Temporary slopes in the lightly cemented natural sandy bedrock materials should not exceed a vertical height of 8 feet. Higher cuts may be possible, but must be authorized in writing by our office. Temporary cut slopes in existing fills should not exceed 0.5:1.

Prior to the placement of any fill, an axial subdrain should be placed down the general alignment of the existing creek. The subdrain should consist of a minimum 6 inch diameter perforated PVC Schedule 80 pipe enveloped in Class 2 permeable filter rock. The use of 3/4 inch drain rock is not recommended for these systems due to the potential for piping failures to occur at breaches in the fabric. This axial drain may be connected later to the various bench drains to be constructed under the adjacent filled slopes.

During fill construction, it would be permissible to convey any small amounts of summertime creek water down through the subdrain pipe. However, during potential periods of rainfall, or if unacceptable to the permitting municipal authority, it may be necessary to provide a temporary by-pass prior to fill construction.

Rip-Rap Buttress

At the toe of the new slope, we recommend that a rock rip-rap buttress be constructed to create an armored surface to the toe of the slope to limit erosion and piping failures. The rip-rap buttress will start at, and around, the concrete energy dissipater for the storm drain outfall, and extend a minimum of 15 feet up the slope. The rip-rap buttress may have a finished surface gradient of up to 1.5:1.

The rip-rap should consist of a crushed, well graded rock mix, with particles ranging from 4 to 24 inches in nominal diameter. Under and behind the rip-rap, a 1 foot thick (minimum) layer of 3/4 to 1.5 inch drain rock should be placed to help cushion the underlying filter fabric from the rock rip-rap edges. Under and around the drain rock cushion, a layer of filter fabric should be placed over a 1 foot thick layer of Class 2 permeable filter rock. The filter rock may be placed directly against the native and compacted soils.

A perforated (filter fabric wrapped) collection pipe (SDR-35 or stronger) pipe should be installed within the filter rock layer to collect any water and convey it to drain into the energy dissipater, or other approved outlet location.

Fill Construction

Fill materials may consist of approved on-site soils which are free of organic materials, and rock fragments larger than 6 inches in nominal diameter. Import soils should also be clean, generally granular, having a PI of less than 15. All proposed import fill materials must be approved for import to the site by the project soils engineer.

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The new fills will need to be compacted onto benches cut into the native, unfailed "bedrock" materials, as verified by our office. Hard benches should be struck at vertical intervals no more than 20 feet vertically. A chimney drain extending a minimum of 5 feet up the back cut of these hard benches should be provided to collect any ground water attempting to enter into the underside of the fill. Due to the sandy nature of the site soils, we recommend that the collector subdrains consist of a perforated Schedule 80 pipe with a filter fabric sock, enveloped in Class 2 permeable filter rock.

Where fill thicknesses will exceed 25 feet, the lower portions of the fill must be compacted to a minimum of 95 percent of their maximum dry density (MDD) as determined by ASTM D-1557. Where fills are thinner than 25 feet, and in the upper 25 feet of a deeper fill, the soils need only be compacted to a minimum of 90 percent of their MDDs.

Permanent slopes are to be no steeper than 2:1 for soils, and 1.5:1 for rock rip rap materials. Upon completion of the fill construction, the exposed soil surfaces should be vegetated to limit erosion. Where fill, or denuded natural, slopes are steeper than 10:1 we recommend that an erosion control fabric be placed over the soil to limit erosion until vegetation can become well established. The erosion control fabric should extend a minimum of 3 feet beyond the axis of the crotch between fill slopes and native slopes.

Surface Drainage

The finished fill surface should slope back away from the crest of the downslope face in order to drain surface waters to a new catch basin located a minimum of 20 feet from the crest of the downstream fill face. This basin should have a perforated riser pipe to permit water to still access the catch basin in the event that the entry grate is not adequately maintained. The catch basin should be located over a man-hole which will serve as the turning point/grade break in the storm drain system extension.

We anticipate that the alignment of the proposed drain line extension may be oriented down the center of the ravine. However, the alignment of the pipeline may be moved laterally towards either side of the ravine fill as desired.

The existing southern V-ditch collection system should be cleaned and repaired as necessary. The outfall pipe should be extended to discharge into the new energy dissipater at the toe of the new fill. All pipelines discharging into the V-ditch should be replaced with smooth-walled pipes which discharge at least sub-parallel to the flow in the axis of the V-ditch (rather than as they current drain perpendicular to the ditch).

An existing culvert for the access roadway to the Pearson residence should be replaced with a new pipeline which will convey the roadway water down into extended storm drain system within the ravine fill.

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LIMITATIONS

The information and recommendations contained in this letter have been prepared for the design and implementation of the agreed upon slide/slope repair which was the subject of the litigation. This report has been prepared for the exclusive use of the addressee, and the architects and engineers for aiding in the design and construction of the proposed repairs. It is the addressee's responsibility to provide this report to the appropriate design professionals, building officials, and contractors to ensure correct implementation of the recommendations.

The opinions, comments and conclusions presented in this report were based upon information derived from our field investigations. Conditions may vary from those observed and anticipated. Such variations may result in changes to our recommendations and possibly variations in project costs. Should any additional information become available, or should there be changes in the proposed scope of work as outlined above, then we should be supplied with that information so as to make any necessary changes to our opinions and recommendations. Such changes may require additional investigation or analyses, and hence additional costs may be incurred.

Our work has been conducted in general conformance with the standard of care in the field of geotechnical engineering currently in practice in the San Francisco Bay Area for projects of this nature and magnitude. We make no other warranty either expressed or implied. By utilizing the design recommendations within this report, the addressee acknowledges and accepts the risks and limitations of development at the site, as outlined within the report.

Should you have any questions please contact the undersigned.

Respectfully Submitted; GeoForensics, Dac. Daniel F. Dyckman, PE, GE Senior Geotechnical Engineer, GE 2145 cc: 4 to addressee; 1 to Bowman & Williams (attn: Joel Ricea

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COUNTY OF SANTA CRUZ

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

STAFF REPORT

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Riparian Exception - Level III 10/2/08

Assessor's Parcel Number: 102-121-34, 102-121-37, 102-121-70 Site Address: 101 Benedict Ave, Santa Cruz, CA 95065 Owner: Pete and Haruyo Pearson

EXHIBITS:

A. Sheet C1.0, Grading and Drainage Plan, prepared by Bowman and Williams, 1/29/08 B. Tree Appraisal by Robert B. Hoffman, Consulting Arborist, 6/24/08

PROPOSAL & LOCATION:

This permit authorizes the removal of up to 93 hazardous eucalyptus trees in a riparian corridor. The stumps and leaf litter/tree debris are to be left in place to prevent erosion until a permanent revegetation and erosion control plan is approved under development application 08-0106. This project is located in the riparian corridor at the end of Benedict Avenue about 150 feet west of the intersection with Cabrillo Avenue in Santa Cruz, California.

ANALYSIS

Recent slope failures in the riparian corridor at the end of Benedict Avenue present an immanent hazard to the adjacent homes on Benedict Avenue and Cabrillo Avenue. In addition, the eucalyptus trees may drop limbs and have the potential to fall over during winter storms given the unstable soils in the area.

Development application 08-0106 is to remove the unstable material in the riparian corridor, replace it with engineered fill and install a drainage pipe at the base of the corridor to prevent future instability. The application is currently under review by Environmental Planning. The eucalyptus trees that will be removed under Riparian Exception 08-0397 will ultimately need to

Owner: Pete and Haruyo Pearson Application #: 08-0397 APN: 102-121-34, 102-121-37, 102-121-70

be removed for the grading project to take place. A revegetation plan with mitigation and monitoring shall be required for the riparian corridor as a condition of the grading permit.

Removal of the eucalyptus trees is being authorized prior to issuance of the grading permit because the grading will not be authorized until after the winter grading season, during which the trees pose an increased hazard to the adjacent homes.

Findings are on file in the County Planning Department.

STAFF RECOMMENDATION

The Project Planner for Environmental Planning has acted on your application as follows:

XX

APPROVED (IF NOT APPEALED)

DENIED based on the attached findings.

NOTE: This decision is final unless appealed.

> See below for information regarding appeals. You may exercise your permit after signing below and meeting any conditions that are required to be met prior to exercising the permit. If you file an appeal of this decision, permit issuance will be stayed and the permit cannot be exercised until the appeal is decided.

THIS PERMIT WILL EXPIRE ON October 6, 2010 IF NOT EXERCISED.

If you have any questions, please contact me at (831) 454-3164.

Sincerely,

Antonella Gentile **Resource Planner**

10.2.08 Date:

By signing this permit below, the owner agrees to accept the terms and conditions of this permit and to accept responsibility for payment of the County's cost for inspection and all other action related to noncompliance with the permit conditions.

Environmen	Ital Review Inital Study
ATTACHMENT	5. 2.A.B
APPLICATION	08-0106

Owner: Pete and Haruyo Pearson. Application #: 08-0397 APN: 102-121-34, 102-121-37, 102-121-70

Signature of Owner/Agent

10/2/08

Date

Mail to: Richard Emigh 413 Capitola Ave Capitola, CA 95010

APPEALS

In accordance with Section 18.10.300 et seq of the Santa Cruz County Code, the applicant may appeal an action or decision taken on a Level III project such as this one. Appeals of decisions of the Principal Planner are made to the Planning Director. All appeals shall be made in writing and shall state the nature of the application, your interest in the matter, and the basis upon which the decision is considered to be in error. Appeals must be made no later than fourteen (14) calendar days following the date of action from which the appeal is being taken and must be accompanied by the appropriate appeal filing fee.

Environmental Review Inital Study ATTACHMENT **APPLICATION**

Owner: Pete and Haruyo Pearso.. Application #: 08-0397 APN: 102-121-34, 102-121-37, 102-121-70

RIPARIAN EXCEPTION FINDINGS

- 1. THAT THERE ARE SPECIAL CIRCUMSTANCES OR CONDITIONS AFFECTING THE PROPERTY. The trees on this parcel pose a hazard to neighboring properties both because of their tendency to drop limbs and because the trees have the potential to fall during winter storms due to unstable soils in the area.
- 2. THAT THE EXCEPTION IS NECESSARY FOR THE PROPER DESIGN AND FUNCTION OF SOME PERMITTED OR EXISTING ACTIVITY ON THE PROPERTY. The property is subject to slope failures that will affect adjacent houses. The hazard will be mitigated through regrading of the corridor under a separate permit application. The trees will be required to be removed in order to create a stable slope in the corridor.
- 3. THAT THE GRANTING OF THE EXCEPTION WILL NOT BE DETRIMENTAL TO THE PUBLIC WELFARE OR INJURIOUS TO OTHER PROPERTY DOWNSTREAM OR IN THE AREA IN WHICH THE PROJECT IS LOCATED. <u>A restoration and</u> <u>mitigation and monitoring plan will be required as a condition of the grading permit.</u> <u>Additionally, tree removal will not result in accelerated erosion, as the stumps and ground</u> <u>cover will remain in place and additional erosion control measures shall be implemented</u> <u>as necessary.</u>
- 4. THAT THE GRANTING OF THE EXCEPTION, IN THE COASTAL ZONE, WILL NOT REDUCE OR ADVERSELY IMPACT THE RIPARIAN CORRIDOR, AND THERE IS NO FEASIBLE LESS ENVIRONMENTALLY DAMAGING ALTERNATIVE. This project is not located within the Coastal Zone.
- 5. THAT THE GRANTING OF THE EXCEPTION IS IN ACCORDANCE WITH THE PURPOSE OF THIS CHAPTER, AND WITH THE OBJECTIVES OF THE GENERAL PLAN AND ELEMENTS THEREOF, AND THE LOCAL COASTAL PROGRAM LAND USE PLAN. The granting of this Exception is in accordance with the purpose of this Chapter and with the objectives of the General Plan and elements thereof in that it is being granted to protect the structures on adjacent properties and the occupants of those structures from harm that may be caused by the trees dropping limbs and/or falling over due to future slope failure.

Environmental Review Inital Study ATTACHMENT_5 APPLICATION_

REQUIRED CONDITIONS

- I. This permit authorizes the applicant to exercise a Minor Riparian Exception. Prior to exercising any rights granted by the permit including, without limitation, any occupancy, construction or site disturbance, the applicant/owner shall:
 - A. Sign, date, and return to the Planning Department one copy of the approval to indicate acceptance and agreement with the conditions thereof.
 - B. Submit proof that these conditions have been recorded in the Office of the County Recorder.
- II. All tree removals shall occur in the area shown on Exhibit A to be regraded. For reference in the field, a copy of these conditions shall be included with all plans. Prior to the final building inspection clearance, the following conditions must be met:
 - A. Tree removal operations are limited to the working hours 8:00 AM to 5:00 PM Monday through Friday.
 - B. No tree removal shall be performed during raptor nesting season, January 1-July 31.
 - C. If the grading permit is not obtained prior to the expiration of this Riparian Exception, a restoration plan shall be required to mitigate for the removed trees.
 - D. Tree stumps and leaf litter/existing tree debris on the ground shall be left in place to prevent erosion.
 - E. The property owner, applicant or other responsible party shall contact Environmental Planning at (831) 454-3164 two working days prior to site disturbance. At that time, a pre-construction meeting shall be scheduled. The tree contractor, the arborist, the property owner, and Environmental Planning staff shall attend the meeting.
 - F. Erosion control measures shall be installed as necessary. All disturbed soils shall be stabilized, as identified in the field, to prevent siltation in the watercourse.
 - G. A site inspection is required prior to final Planning Department approval of the proposed work; notify Environmental Planning at (831) 454-3164 upon project completion for final inspection and clearance.
 - H. All work shall conform to the recommendations of the approved arborist's report by Robert B. Hoffman dated 6/24/2008, with exception to the removal of historic tree debris.
 - I. Pursuant to Sections 16.40.040 and 16.42.100 of the County Code, if at any time during site preparation, excavation or other ground disturbance associated with this

Environmental Review Inital Study ATTACHMENT 5 5 APPLICATION 708

Owner: Pete and Haruyo Pearso. Application #: 08-0397 APN: 102-121-34, 102-121-37, 102-121-70

> development, any artifact or other evidence of an historic archeological resource or a Native American cultural site is discovered, the responsible persons shall immediately cease and desist from further site excavation and notify the Sheriff-Coroner if the discovery contains human remains and the Planning Director if the discovery contains no human remains. The procedures established in Sections 16,40,040 and 16,42,100 shall be observed.

IV. Operational Conditions

A. In the event that future County inspections of the subject property disclose noncompliance with any conditions of the Approval or any violation of the County Code, the owner shall pay to the County the full cost of such County inspections, including any follow-up inspections and/or necessary enforcement actions, up to and including permit revocation.

In accordance with Chapter 18.10 of the County Code, minor variations to this permit which do not affect the overall concept, intensity, or density may be approved by the Planning Director at the request of the applicant or staff.

NOTE: THIS PERMIT EXPIRES TWO YEARS FROM THE DATE OF APPROVAL UNLESS YOU OBTAIN YOUR GRADING PERMIT AND COMMENCE CONSTRUCTION.

Environmental Review Inital Stud ATTACHMENT_4 APPLICATION