



COUNTY OF SANTA BARBARA

Planning and Development

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TABLE OF CONTENTS

	Page
1. Introduction	1
2. Rules for Use and Criteria for Amendment	3
3. Relationship Between Thresholds and Policies	5
4. Agricultural Resource Guidelines.....	7
5. Air Quality Thresholds	17
6. Biological Resources	25
7. Coastal Resources	35
8. Cultural Resources Guidelines Archaeological, Historical and Ethnic Elements	45
9. Electromagnetic Fields Threshold	57
10. Geologic Constraints Guidelines	65
11. Groundwater Thresholds Manual.....	67
12. Noise Thresholds.....	109
13. Quality of Life Guidelines	117
14. Public Safety Thresholds	119
15. Schools Thresholds (Interim).....	127
16. Surface and Storm Water Quality Significance Guidelines.....	129
17. Solid Waste Thresholds	137
18. Thresholds of Significance for Traffic Impacts and Contents of a Traffic Study.....	143
19. Visual Aesthetics Impact Guidelines	149
APPENDIX A: Biological Resources/Technical Background	A-1

1. INTRODUCTION

This manual has been prepared to assist the public, the applicant, environmental consulting firms, and County decision makers in understanding the use and application of various environmental impact thresholds as they relate to project proposals.

The Emergence of the Environmental Impact Assessment Process in California

At the height of the environmental movement, the California State legislature passed the Environmental Quality Act of 1970 (CEQA)¹. The California law, closely patterned after the National Environmental Policy Act (NEPA), included a requirement that assessments be made of the environmental impact of all proposed, publicly sponsored projects. These assessments were to take the form of "environmental impact reports" (EIR) that were nearly identical to the "environmental impact statements" (EIS) of NEPA. Like the EIS, the EIR was intended to be a source of data which would better inform the decision maker of the implications of approving or disapproving a publicly undertaken or funded project.

The EIR, which environmentalists considered a rather limited document in 1970, became one of their principal tools when in 1972, the State Supreme Court handed down its "Friends of Mammoth" decision.² The court held that an EIR is required before state or local government may grant a permit authorizing the construction of privately undertaken projects which may have a significant effect on the environment.

Subsequently, the State Secretary for Resources devised procedures for the writing and processing of EIRs. These County Guidelines are available for purchase or review at the Planning and Development Department located at 123 East Anapamu Street, Santa Barbara, 93101, or 624 Foster Road, Suite C, Santa Maria, 93455.

Additionally, the State Guidelines set out what decisions and tasks have to be performed by local government in the processing of EIRs. First of all, local governments are charged with the duty of determining if a proposed project has the potential to significantly affect the environment. In typically legalistic fashion, the guidelines define "significant effect" as "a substantial adverse impact on the environment", and "environment" as "the physical conditions which exist in the area which will be affected by a proposed project including land, air, water, minerals, flora, fauna, ambient noise, objects of historical or aesthetic significance." (CEQA Section 15382)

Secondly, the local governments must determine if the proposed activity is a "project" as defined by the state. The guidelines define "project" as: the whole of an action, resulting in physical impact on the environment, directly or ultimately, that is any of the following:

1. An activity directly undertaken by any public agency including but not limited to public works construction and related activities, clearing or grading of land, improvements to existing public structures, enactment and amendment of zoning ordinances, and the adoption of local General Plans or elements thereof;
2. An activity undertaken by a person which is supported in whole or in part through public agency contracts, grants, subsidies, loans, or other forms of assistance for one or more public agencies;
3. An activity involving the issuance to a person of a lease, permit, license, certificate, or other entitlement for use by one or more public agencies. (CEQA Section 15378)

¹ California Public Resources Code §§21000-21151.

² Friends of Mammoth vs. Board of Supervisors of Mono County, 8 Cal. 3d 1, 500 P.2d 1360, 104 Ca. Rptr. 16 (1972), modified, 8 Cal. 3d 247, 502 P.2d 1049, 104 Cal. Rptr. 761 (1972)

The local governments must also determine if the proposed project calls for a discretionary decision or merely ministerial approval or non-approval. The guidelines define a discretionary project as one "which requires the exercise of judgment, deliberation, or decision on the part of the public agency or body in the process of approving or disapproving a particular activity, as distinguished from situations where the public agency or body merely has to determine whether there has been conformity with applicable statutes, ordinances, or regulations.

Determining whether or not a proposed project is "categorically exempt" from CEQA is also a function of the local governments. The state has listed a number of project types to which CEQA does not apply. In general, these "categorically exempt" projects include: construction or replacement of single structures in environmentally non-crucial areas, minor alterations to the land, and governmental regulatory action intended to manage resources.

Determining whether or not a project will have a "significant effect" on the environment is an additional decision to be made by local government. This is the first important decision in that it involves the discretion of the agency. A positive finding commits the agency to request that the project description (i.e. plans/proposals) be substantially revised to avoid significant impact, or failing in that, to have prepared an EIR. If no possible significant effect is foreseen, a "negative declaration" is prepared and the proposed project is processed as it would have been prior to CEQAs enactment.

It is the responsibility of the local government to commission the drafting of an EIR. Most local agencies do not have the staff to prepare an EIR, consequently the task is normally contracted to a consulting firm.

Lastly, local government is charged with the duty of reviewing and finalizing the EIR. The state guidelines require that all interested agencies have the opportunity to review and comment on the adequacy of a draft EIR. Before the agency can make a decision regarding the project at hand, the draft EIR has to be finalized by including and responding to, if necessary, the comments made during review. Once the EIR is finalized, it is considered an official document containing data for the decision maker.

Several state and federal court decisions have defined the terms: substantial, potentially adverse, adverse, and significant. The following narrative is a brief sketch of conclusions related to only one of the court cases which have a substantial bearing upon the Guidelines and Thresholds used in this manual to determine levels of significant impact.

"The important feature of this decision was that an EIR must be prepared whenever it can be fairly argued on the basis of substantial evidence that the project may have a significant environmental impact. Further, the interpretation of significant effect "which will afford the fullest possible protection to the environment within the reasonable scope of the statutory language is one which will impose a low threshold requirement for preparation of an EIR." (California Supreme Court decision in the case of No Oil, Inc. vs. City of Los Angeles, 12/10/1974)

As a consequence, many California cities and counties use guidelines or thresholds of significance to determine whether or not a project proposal may have a significant effect on the environment.

In terms of addressing potentially significant adverse environmental impacts, the following thresholds are used as guidelines to determine the level of significance for any given impact. The discussions which follow are designed to provide an understanding of how thresholds of significance are applied to projects under review by the Planning and Development Department. Should projects exceed these thresholds, an Environmental Impact Report may be warranted.

These environmental thresholds and guidelines are intended to supplement provisions in the State Guidelines for determination of significant environmental effect including Sections 15064, 15065, 15382 and Appendix G.

2. RULES FOR USE AND CRITERIA FOR AMENDMENT

The following passages from Santa Barbara County's *Guidelines for the Implementation of CEQA* describe how thresholds are to be used and amended.

Rules for Use

The Planning and Development Department's determination on whether or not a project may have a significant effect on the environment shall be based in part on thresholds of significance. These thresholds are measures of environmental change which are either quantitative, or as specific as possible for topics which are resistant to quantification such as aesthetics, cultural resources, and biology. A project which has no effect above threshold values individually or cumulatively shall be determined not to have any significant effect, and a negative declaration shall be prepared as provided by Article IV. Projects which have a potential effect above a threshold of significance will require an EIR.

Thresholds of significance are intended to supplement provisions in the State Guidelines for determination of significant environmental effect including Sections 15064, 15065, 15382 and Appendix G incorporated herein. The Planning and Development Department shall maintain detailed descriptions of current thresholds, which shall be publicly available, and which shall be revised periodically as necessary to maintain a standard which will afford the fullest possible protection to the environment, within the reasonable scope of CEQA, by imposing a low threshold requirement for the preparation of an EIR. For issue areas for which there are no thresholds, the guidance provided in CEQA Sections 15064, 15065, 15382 and Appendix G shall provide the basis for determining significance.

Criteria for Amendment

- A. General.** Several threshold methodologies include a mechanism to enable them to respond automatically to environmental change. For example, changes in attainment status relative to air quality standards, changes in traffic levels on roads, and changes in the balance between water supplies and water use all affect how thresholds determine significance. However, other changes in environmental conditions or environmental information may require an alteration to the methodology used to evaluate significance.
- B. Change of Scientific Basis and Criteria.** The underlying basis of threshold criteria may change with the discovery of new data or theories about relationships between environmental change and environmental quality. When data from scientific publications, reports, or conference proceedings, etc. suggest the need for such a change, the Planning and Development Department shall review these data and determine the justification for threshold revisions.
- C. Change in Environmental Circumstances.** Environmental characteristics such as groundwater levels, traffic counts and sensitive biological habitat acreage are subject to constant change due to development trends. In order to ensure reasonable significance determinations, thresholds will be changed to reflect changes in environmental carrying capacity, resource scarcity and resource use. Information on such changes may come from resource managers (e.g. water purveyors, Air Pollution Control District), applicants, or the public.
- D. Workshops.** The Planning and Development Department will hold public workshops on environmental thresholds at least once a year. The workshops have several purposes: to advise the public of the technical basis for thresholds and how they are used in the environmental review process; to propose revisions as necessary; to obtain public comment on each threshold and the need for revisions; and to gather relevant data from the public for inclusion in threshold data

bases. These workshops and threshold revisions will occur annually unless new information suggests that the purpose of a threshold can only be served by immediate revision. Any changes in thresholds made without opportunity for comment at a public workshop shall be posted in a public area of the Planning and Development Department for at least 30 days following adoption of the changes and shall be reviewed at the next workshop. A determination by the Planning and Development Department to revise a threshold may not be appealed.

- E. Application of Threshold Revisions to Projects in the Review Process.** When thresholds are revised due to new information, updated cumulative impact assessment, an improved methodology, or any other reason that provides a more accurate response to or reflection of existing conditions, the revised threshold shall be applied to projects in process up until an environmental document is found to be adequate and complete by the environmental hearing officer. Alternatively, if a threshold revision is simply a matter of applying a different standard, such a revision shall only be applied to any projects which are found to be complete after the threshold is revised.

3. RELATIONSHIP BETWEEN THRESHOLDS AND POLICIES

Environmental thresholds are often but not always based on policies and standards from the Comprehensive Plan. The agricultural resources guidelines, biological resources guidelines, and noise thresholds are examples of thresholds that are partially derived from and consistent with Comprehensive Plan policies. Although consistency between thresholds and policies is a general goal, there are situations in which strict consistency is not desirable. For example, due to concerns about the existing severity of these problems, policies relating to water and traffic are in many cases more restrictive than the thresholds for these issues. Lowering the thresholds to make them consistent with restrictive policies would greatly increase the burden of complying with CEQA on both applicants and the County. Instead, the County's thresholds for water and traffic impacts are designed to indicate cutoff points at which at a project's contribution to these cumulatively significant problems become substantial. Achieving planning goals through the use of strict policies is both justifiable and efficient and does not undermine the use of CEQA and environmental thresholds to move toward those same goals.

4. AGRICULTURAL RESOURCE GUIDELINES (Approved by the Board of Supervisors August 1993)

A. Introduction.

The State: California's 36,000,000 acres of agricultural land produce important economic and environmental benefits to the people of the state, nation, and world. Covering one-third of the state, agricultural land supports one of California's major industries and is responsible for the production of an important portion of the nation's food and fiber. The state is also a major exporter of produce to the rest of the world. A unique combination of geography, climate and soils enables California agriculture to produce many crops that are produced nowhere else in the United States.

The state's agricultural land also plays a critical environmental role. Farmland is an important filter for rain and snowfall runoff, allowing groundwater basins to recharge themselves. Farms and ranches are wildlife habitats for many common game and endangered species. Agricultural land provides valuable open space, giving visual relief for urban dwellers, and protecting the rural way of life important to farmers, ranchers, and small-town residents. Because of these great public benefits, the unnecessary and/or premature conversion of agricultural lands to urban uses should be discouraged.

Achieving the goal of agricultural land conservation requires wise and efficient land use, and a strong commitment to that goal by local officials. A California appeals court in Clery vs. County of Stanislaus (1981) 118 Section App. 3d 348, has indicated that the conversion of agricultural land to nonagricultural uses may in itself be considered a significant environmental impact. To assure that the impacts of agricultural land conversion are considered in project decisions, environmental documents should contain information about the impacts of projects on agricultural land. Government officials can make better decisions affecting agricultural land when they have complete data about the land and its relationship to the agricultural economy.

The County: Agriculture continues to be Santa Barbara County's major producing industry with a gross production value for 1991 of more than \$500 million. This is an increase of nearly two hundred million dollars from the 1981 total. Santa Barbara County's agricultural industry includes vegetable, field, fruit and nut, and seed crops, nursery products, livestock, poultry, and aviary products. (Santa Barbara County 1991 Agricultural Report)

The diversity of our agriculture continues to provide a strong economic base through its multiplier effect on our local economy. With thirty-seven different commodities exceeding a million dollars in value, our local agricultural diversity provides stability against the cyclic nature of weather, pests, and especially market fluctuations which currently are plaguing agriculture in other parts of the nation. (Op cit)

Agricultural preservation in the County has been extremely successful to date in placing lands adjacent to urban areas, as well as more remote lands, under Williamson Act agreement which provides for taxation according to agricultural rather than market value of the land.

Qualifications for lands to be designated as agricultural preserves are found in "Criteria for Agricultural Preserves", adopted by the Santa Barbara County Board of Supervisors. The land must either be in a Class I or II Soil Capability classification, as prescribed by the U.S. Soil Conservation Service, or qualify for an 80 to 100 rating in the Storie Index System to be designated prime land, in which case the minimum size of a preserve is 40 acres. Land also can qualify as prime if it fulfills one of the following: it supports livestock at a density of one animal per acre; is in orchard use that can return at least \$200 per acre; or is devoted to other agricultural production that generally would return \$200 per acre. Farm

land not meeting these qualifications is classified as non-prime, and the minimum size for an agricultural preserve is 100 acres. However, in certain instances, super prime land of at least 5 acres in a separate ownership may be combined with adjacent prime land to meet the 40 acre minimum requirements.

B. Determination of Significant Effect.

CEQA Section 15064 states that:

- “(b) The determination of whether a project may have a significant effect on the environment calls for careful judgment on the part of the public agency involved, based to the extent possible on scientific and factual data. An ironclad definition of significant effect is not possible because the significance of an activity may vary with the setting. For example, an activity which may not be significant in an urban area may be significant in a rural area.
- (d) In evaluating the significance of the environmental effect of a project, the Lead Agency shall consider both primary or direct and secondary or indirect consequences.
 - (1) Primary consequences are immediately related to the project such as the dust, noise, and traffic of heavy equipment that would result from construction of a sewage treatment plant and possible odors from operation of the plant.
 - (2) Secondary consequences are related more to effects of the primary consequences than the project itself and may be several steps removed from the project in a chain of cause and effect. For example, the construction of a new sewage treatment plant may facilitate population growth in the service area due to the increase in sewage treatment capacity and may lead to an increase in air pollution.”

CEQA Appendix G states that a project will normally have a significant impact on the environment if it will:

- 1. Conflict with adopted environmental plans and goals of the community where it is located.
- 2. Convert prime agricultural land to non-agricultural use or impair the agricultural productivity of prime agricultural land.

C. Comprehensive Plan Policies and Goals.

The following agricultural goals and policies are taken from the County's Comprehensive Plan Land Use Element, the Environmental Resources Management Element (ERME), the Local Coastal Plan, the Agricultural Element, and adopted Community Plans.

Land Use Element

Agriculture: In the rural areas, cultivated agriculture shall be preserved and, where conditions allow, expansion and intensification should be supported. Lands with both prime and non-prime soil shall be reserved for agricultural uses.

Carpinteria - Summerland Area Goal: The agricultural economy and the semi-rural qualities of the area should be preserved. Every effort should be made to preserve fertile lands for agriculture.

Santa Ynez Valley Area Goal: Agriculture should be preserved and protected as one of the primary economic bases of the Valley.

Goleta Area Goal: Existing orchards and groves should be preserved, and expansion of agricultural land use, particularly orchards and grazing, should be encouraged.

Lompoc Area Goal: Prime agricultural lands should be preserved for agricultural use only. Preservation

of lesser grades of presently producing or potential agricultural land should be actively encouraged.

Environmental Resource Management Element (ERME)

The Santa Barbara County Comprehensive Plan Environmental Resources Management Element (ERME) states that existing croplands on prime soils should be preserved. For agricultural lands on less than prime soil, is should be preserved insofar as possible.

Under Category A, Urbanization should be prohibited in:

- Existing croplands with a high agricultural suitability rating (within study areas) or a Class I or II soil capability classification. Modification to permit urban uses may be made, within Urban areas, on parcels of 10 acres or less.
- Agricultural preserves subject to Williamson Act agreements.

Under Category B, Urbanization should be prohibited except in a relatively few instances in:

- Existing croplands with a moderate or low agricultural suitability rating (in urban areas) or a Class III or IV soil capability classification.
- Lands highly suitable for expansion of cultivated agriculture.

It is noted that agricultural preserves, although not subject to environmental constraints, are included in Category A. The reason is that in entering into Williamson Act agreements, the County has made a legal commitment that the land will remain in agricultural use for a minimum of ten years, subject to automatic annual renewal.

Agricultural Element

The Agricultural Element Goals and Policies can be found on pages 7 - 14 of the document. These goals and policies are briefly summarized below:

Goal I speaks to the preservation, encouragement, and enhancement of agriculture. This is accomplished through policies which discourage incompatible uses, promote an agriculturalist's freedom for determining methods of operation, encouraging land improvement programs, supporting the Williamson Act, recognizing certain nuisances are part of agricultural operations, protecting the availability of resources for agriculture, and encouraging sustainable agricultural practices on agricultural land.

Goal II calls for agricultural land to be protected from adverse urban influence. This is accomplished through policies which prevent flooding and silting from urbanization, protect agricultural property from being illegally violated, discourage expansion of urban spheres of influence, and discouraging conversion of highly productive agricultural lands.

Goal III calls for the preservation of remaining agricultural lands in cases where it is necessary to convert agricultural lands to other uses. This accomplished through policies which discourage expansion of urban development into active agricultural lands, and to promote and retain productive agricultural land within urban boundaries.

Goal IV recognizes that agriculture can enhance and protect natural resources, and therefore these operations should be encouraged to incorporate resource protection techniques. This is accomplished through policies which encourage range improvement and fire reduction programs, the use of agriculture on certain slopes to prevent erosion, and preventing grading and brush clearing on hillsides which would cause excessive erosion.

Goal V calls for the County to allow for areas and installations of uses supportive to agriculture. It

accomplishes this through policies allowing the installation of commercial support uses on-farm, and allowing areas for supportive agriculture services within a reasonable distance to the farm user.

Goal VI calls for making provisions to allow for effective access to agricultural areas. This includes a policy which encourages the County to design roads in agricultural areas with agricultural vehicles in mind.

Coastal Land Use Plan

Agricultural policies in the Coastal Land Use Plan (CLUP) are found on Pages 106 - 113 of that document, and are listed as Policies 8-1 through 8-10. Briefly, these policies speak to the following issues:

- Defining the criteria for assigning agricultural land use designations in rural areas.
- Defining the criteria for allowing conversion of agriculturally designated land not contiguous with an urban/rural boundary.
- Defining the criteria for allowing conversion of agriculturally designated land contiguous with an urban/rural boundary.
- Defining the finding which must be made for approving a land division of any land designated as Agriculture I or II.
- Setting the criteria and findings for environmental review of greenhouse projects of 20,000 or more square feet.
- Setting setback and maximum lot coverage requirements for greenhouses, hothouses, and accessory structures.
- Setting landscaping and screening requirements for greenhouses and/or accessory buildings.
- Setting the criteria for the protection of large, non-prime agricultural operations of 10,000 acres or more in the Gaviota Coast or North Coast planning areas or large, non-prime operations in the Channel Islands planning area, including the findings and conditions which must be made/required in order to approve any development/land division on such property.
- Setting the criteria for subdivision of legal parcels of non-prime agricultural land in excess of 2,000 acres which are designated as AG-II-320.

Goleta Community Plan

Policy LUA-GV-1: Land designated for agriculture within the urban boundary shall be preserved for agricultural use, unless the County makes findings that the land is no longer appropriate for agriculture or there is an overriding public need for conversion to other uses for which there is no other land available in the Goleta urban area.

Policy LUA-GV-2: New development adjacent to agriculturally zoned property shall include buffers to protect agricultural operations.

Policy LUS-GV-4: In consideration of conversion of any agricultural land within the urban boundary to urban uses, the County shall first consider smaller, more isolated parcels with greater urban/agricultural conflicts prior to larger blocks of agricultural land.

Summerland Community Plan

Policy LUA-S-1: Existing land designated for agriculture shall be preserved for agricultural use.

Policy LUA-S-2: New development adjacent to agricultural zoned property shall include buffers to protect the viability of agricultural operations adjacent to the community.

Montecito Community Plan

Policy LUG-M-2.1: Agricultural activities on residential parcel that are consistent with the provisions of the applicable residential zone district shall be supported and encouraged by the County.

D. Methodology in Determining Agricultural Suitability and Productivity

The County Initial Study form contains two questions pertaining to impacts on agricultural resources. The first is as follows:

“10.d. Will the proposal result in the conversion of prime agricultural land to non-agricultural use, impairment of agricultural land productivity (whether prime or non-prime), or conflict with agricultural preserve programs?”

The following weighting system is provided to perform a preliminary screening of a project's agricultural impacts during the initial study process. The initial study screening looks at the value of a site's agricultural suitability and productivity, to determine whether the project's impact on loss or impairment of agricultural resources would be a potentially significant impact. These are guidelines, to be used with flexibility in application to specific sites, taking into account specific circumstances and specific agricultural uses.

The weighted point system is utilized to assign relative values to particular characteristics of a site's agricultural productivity (e.g., soil type, water supply, etc.). Where the points from the following formula total 60 or more, the following types of projects will be considered to have a potentially significant impact:

- A division of land (including Parcel and Final Maps, etc.) which is currently considered viable but would result in parcels which would not be considered viable using the weighting system.
- A Development Plan, Conditional Use Permit, or other discretionary act which would result in the conversion from agricultural use of a parcel qualifying as viable using the weighting system.
- Discretionary projects which may result in substantial disruption of surrounding agricultural operations.

If a potentially significant impact is identified using these criteria, further more detailed, site-specific evaluation of agricultural impacts is completed in an EIR. This analysis should focus upon the factors and criteria, but not the points, in the weighting system of these guidelines, and any other relevant factors such as the history of agricultural use on the site, land use trends, etc. Final determination of the project's level of impact will be based on this analysis.

As a general guideline, an agricultural parcel of land should be considered to be viable if it is of sufficient size and capability to support an agricultural enterprise independent of any other parcel. To qualify as agriculturally viable, the area of land in question need only be of sufficient size and/or productive capability to be economically attractive to an agricultural lessee. This productivity standard should take into consideration the cultural practices and leasehold production units in the area, as well as soil type and water availability. For dry land farming and grazing operations the production or carrying capacity should be based upon normal rainfall years only, not periods of drought or heavy rainfall. It should be noted that the Santa Barbara County Cattlemen's Association has stated that an appropriate threshold for impacts to grazing land in the County is the displacement or division of land capable of sustaining between 25 to 30 animal units per year. This "threshold" utilizes a carrying

capacity threshold similar to the weighting system below. Because of this, on grazing projects, detailed information of the number of animal units supportable on a particular parcel should also be considered in the project's environmental document.

The Agricultural Threshold is weighted toward physical environmental resources rather than economics. This emphasis is in keeping with CEQAs emphasis on physical environmental impacts and not social or economic impacts (State CEQA Guidelines Section 15131). Given high land values in the County and the subdivision and turnover of agricultural lands in some areas of the County, agricultural production on some lands may be economically marginal. Because of these factors, economics is considered primarily a planning issue and will not be addressed in environmental documents.

The following determination of agricultural land value is divided into nine components which are weighted according to their estimated resource value. These nine areas are:

Parcel size	Agricultural Suitability	Adjacent Land Uses
Soil Classification	Existing & Historic Land Use	Agricultural Preserve Potential
Water Availability	Comprehensive Plan Designation	Combined Farming Operations

- 1. Parcel Size.** Large parcel size is, in general, an important indicator of potential agricultural suitability and productivity. However, because of the wide variability in the value of various agricultural products, suitable and productive parcel sizes also vary. Smaller parcels may be viable for high value crops, while significant acreage is necessary for viable grazing operations.

Project Parcel Size	Points Assigned
less than 5 acres	0 - 3
5 acres to less than 10 acres	4 - 6
10 acres to less than 40 acres	7 - 8
40 acres to less than 100 acres	9 - 10
100 acres to less than 500 acres	11 - 12
500 acres to less than 1000 acres	13 - 14
1000 acres or greater	15

- 2. Soil Classification.** Points in this category are based primarily upon soil capability classes from the US Soil Conservation Services Soil Surveys.

The Soil Conservation Service has defined eight soil capability classes. Classes I and II are considered to be prime agricultural soils because they impose few limitations on agricultural production, and almost all crops can be grown successfully on these soils. More limited agricultural soils are grouped into Classes III and IV either because fewer crops can be grown on these soils, special conservation and production measures are required, or both these conditions exist. Classes V, VI, and VII include soils that are suited primarily for rangeland. (Class V is not found in the County.) Finally, soils and landforms that are unsuited for agricultural use are placed in Class VIII.

Where a variety of soil types are present on a site, weight should depend upon extent of useable prime/non-prime acreage. As appropriate, points may be assigned according to approximate percentages of site area containing various soil classifications.

Application of points within the ranges should be based on area and site-specific

considerations. For grazing land, the SCS survey should be checked for opinion on soil suitability, and site vegetation should be inspected for forage value. Sites with soils which can support good forage should be assigned higher points within the range. Similarly, sites with soils classified as non-prime, but which can support specialized high cash crops (e.g., strawberries, avocados and specialty crops) should be assigned higher points within the ranges.

In addition, initial studies should note whenever a site contains large, contiguous areas of prime soil, as this may constitute a separate significant impact.

Soil Classification	Points Assigned
Class I (prime)	14 - 15
Class II (prime)	11 - 13
Class III	8 - 10
Class IV	6 - 7
Class V	1 - 5
Class VI	1 - 5
Class VII	1 - 5
Class VIII	0

- 3. Water Availability.** Availability of water of suitable quantity and quality is a critical component of agricultural suitability and productivity. Assignments of points within the ranges should take into account suitability of water resources for the type of agriculture practiced (i.e. crops or grazing).

Water Availability	Points Assigned
Land has an adequate water supply from on/offsite sources suitable for crops or grazing	12 - 15
Land has water, but may be marginal in quantity or quality suitable for crops or grazing	8 - 11
Land does not have developed water supply but an adequate supply is potentially available	3 - 7
Land does not have developed water and potential sources are of poor quality/quantity	0 - 2

- 4. Agricultural Suitability.** Based upon the Conservation Element of the Comprehensive Plan (p. 195) County lands were assessed and mapped for agricultural suitability classifications based on a computer model which applied weighted factors, including soil classification, water availability, slope, and environmental constraints (flood hazard, local water resources, biological tolerance-intensity, and high groundwater).

Because the Conservation Element does not fully account for the effects of weather on crop suitability, the assessment of suitability should account for the approximate frequency and intensity of frosts and other climactic factors in applying points within the ranges. Parcels which are relatively frost free and may accommodate multiple croppings may be considered more suitable than those which can support only a single crop or limited crop types due to climactic factors.

Agricultural Suitability	Points Assigned
CROPS	
Highly suitable for irrigated grain, truck and field, orchard, or vineyard crops	8 - 10
Highly suitable for irrigated ornamentals, pasture, alfalfa, or dry farming	6 - 8
Moderately suitable for irrigated crops, orchard, ornamentals or dry farming	4 - 5
Low suitability for irrigated crops, orchard, ornamentals or dry farming	1 - 3
Unsuitable for crop production because of soil capabilities, environmental constraints, etc.	0
GRAZING	
Highly suitable for pasture or range	6 - 10
Moderately suitable for pasture or range	3 - 5
Low suitability for pasture or range	1 - 2
Unsuitable for pasture or range	0

5. **Existing and Historic Land Use.** Current or previous use of a property for agriculture can provide a practical measure of its suitability for agriculture, while urban development generally indicates a lack of suitability.

Existing and Historic Land Use	Points Assigned
In active agricultural production	5
In maintained range/pasture	5
Unmaintained, but productive within last ten years	3 - 5
Vacant land: fallow or never planted with range of suitabilities of agricultural potential	1 - 3
Substantial urban or agricultural industrial development onsite	0

6. **Comprehensive Plan Designation.** The County general plan land use maps designate property for long-range uses. Agricultural and open space designations generally provide an indicator of agricultural suitability. However, some older land use designations provide for smaller agricultural parcel sizes than are suitable or viable for sustaining agriculture today. Designations applied more recently by the County as part of community plan updates establish agricultural designations with more realistic parcel sizes. This should be taken into account in assessing suitability with this factor.

Comprehensive Plan Designation	Points Assigned
A - II	5
A-I	4
MA	3 - 4
Existing public/private open space or recreation	3 - 4
Proposed public/private open space or recreation	3 - 4
Open lands	3 - 4
Rural residential 40 - 100 acres	3 - 4
Residential Ranchette 5 - 20 acres	2
Residential less than 5 acres	0
Commercial, Industrial, Community Facility	0

- 7. Adjacent Land Uses (existing).** Adjacent land uses can play an important role in the continuing suitability and productivity of a property for agricultural uses. In general, being surrounded by agricultural or open space is conducive to continued agricultural use, while encroachment of urban uses may be problematic. However, applying points within the ranges should be based on specific circumstances and uses, recognizing that some urban uses are more compatible with agricultural, (e.g., industrial, public facilities), while others conflict (e.g., residential). In addition, the existence or ability to create buffers between incompatible uses should be considered in assessing agricultural suitability with this factor. The adequacy of agricultural support in the vicinity may be another factor affecting agricultural suitability.

Adjacent Land Uses	Points Assigned
Surrounded by agricultural operations or open space in a region with adequate support uses	9 - 10
Surrounded by agricultural operations or open space in a region without adequate agricultural support uses	7 - 8
Partially surrounded by agriculture/open space with some urban uses adjacent, in a region with adequate agricultural support uses ^{1,2}	7 - 8
Partially surrounded by agriculture/open space with some urban uses adjacent, in a region without adequate agricultural support uses ^{1,2}	3 - 6
Immediately surrounded by urban uses, no buffers	0 - 2

Notes:

1. Various types of urban uses create more potential conflicts than others (e.g., residential could create more spraying problems than light industrial).
2. If project is well buffered, it may be agriculturally viable even with adjacent urban uses (e.g., stream, roadway).

- 8. Agricultural Preserve Potential.** Qualifying for agricultural preserve designation under State Williamson Act agreement for prime and non-prime preserves entails meeting criteria for soil type, parcel size [individually or jointly with adjacent parcel(s)], and/or productivity/value on return. Agricultural preserves have constituted one of the most successful means of sustaining and preserving land in agriculture in California.

Agricultural Preserve Potential	Points Assigned
Can qualify for prime agricultural preserve by itself, or is in a preserve	5 - 7
Can qualify for non-prime agricultural preserve by itself	2 - 4
Can qualify for prime agricultural preserve with adjacent parcels	3 - 4
Can qualify for non-prime agricultural preserve with adjacent parcels	1 - 3
Cannot qualify	0

- 9. Combined Farming Operations¹.** This section is designed to award bonus points to parcels which provide a component of a combined farming operation. The reason these points are assigned as a bonus is to address cumulative impacts and to recognize the importance of combined farming operations in Santa Barbara County.

¹ Combined farming operation refers to more than one separate parcel managed as a single agricultural operation.

Bonus Points for Combined Farming Operations	Points Assigned
Provides a significant component of a combined farming operation	5
Provides an important component of a combined farming operation	3
Provides a small component of a combined farming operation	1
No combined operation	0
Cannot qualify	0

E. Use of State Important Farmlands Map

A second question on agricultural land resources is included in the Initial Study under Land Use:

“e. Will the proposal result in any effect [potentially significant adverse effect] upon any unique or other farmland of State or Local Importance?”

The State Important Farmlands Map is used in answering this question. The map is also considered in applying points under the "Agricultural Suitability" category.

The map identifies lands in the following categories:

Prime Farmland - (Land with the best combination of physical and chemical features for the production of agricultural crops)

Farmland of Statewide Importance - (Land with a good combination of physical and chemical features for the production of agricultural crops)

Unique Farmland - (Land of lesser quality soils used for the production of the State's leading agricultural cash crops)

Farmland of Local Importance - (All dry land farming area and permanent pasture)

Grazing Land - (Land on which the existing vegetation is suited to the grazing of livestock)

Urban and Built-up Land - (Land occupied by structures or infrastructure to accommodate a building density of at least one unit to one and one-half acres, or approximately six structures to ten acres)

Other Land - (Land which does not meet the criteria of any other category)

5. AIR QUALITY THRESHOLDS (Approved by the Board of Supervisors April 19, 1994; Interim revisions to Section C.2.a and Section D of Chapter 5 approved by the Board of Supervisors October 3, 2006)

A. Introduction.

Air quality thresholds of significance are intended to help local agencies determine whether a discretionary project will individually or cumulatively have a significant effect on air quality. Santa Barbara County does not meet the state clean air standards for ozone and the state standard for fine particulate matter. Unmitigated air pollution emissions from the operation of some development projects could impair the region's progress in meeting the ozone and fine particulate matter standards.

These thresholds are designed to be used by environmental professionals preparing documents under the California Environmental Quality Act (CEQA) and the land use decision makers who rely on these documents. The goal is to identify projects which may have a significant affect on air quality in Santa Barbara County, so that measures to reduce the impact can be incorporated into the project.

A separate implementation document, [Air Quality Analysis for EIRs](#), explaining how to apply the air quality thresholds of significance is available from the County Planning and Development Department.

1. **Resource Setting.** The federal government and the state of California have established ambient air quality standards to protect public health. California's standards are more protective of public health than the federal standards. State and federal standards have been established for the following pollutants, known as "criteria pollutants":

- ozone (O₃)
- carbon monoxide (CO)
- nitrogen dioxide (NO₂)
- sulfur dioxide (SO₂)
- suspended particulate matter 10 microns or less in diameter (PM₁₀)
- lead

In addition, California standards have been established for:

- sulfates (SO₄)
- hydrogen sulfide (H₂S)
- vinyl chloride
- visibility reducing particles.

Table 1 shows the National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards (CAAQS) for ozone, CO, H₂S, NO₂, and PM₁₀. The table also shows whether the air in Santa Barbara County meets these standards (attainment) or violates them (non-attainment).

Sulfur dioxide, lead, sulfates, vinyl chloride, and visibility reducing particles are not generally a problem in this region and are not discussed further in this document. However, these and other pollutants are regulated by the APCD under their rules and regulations.

The entire County of Santa Barbara violates the federal and state standards for ozone and the state standard for PM₁₀ (particulate matter with an aerodynamic diameter of less than 10 microns). Ozone air pollution is formed when reactive organic compounds (ROC) and nitrogen oxides (NO_x) react in the presence of sunlight. Ozone is a regional pollutant; ozone concentrations throughout the county do not always correspond with the location of sources of the ozone precursors ROC and NO_x. The major sources of ozone precursor emissions in

Santa Barbara County are motor vehicles, the petroleum industry and solvent usage (paints, consumer products and certain industrial processes). Sources of PM₁₀ include mineral quarries, grading, demolition, agricultural tilling, road dust, and vehicle exhaust. Additional information on ozone, PM₁₀, and other pollutants of concern is provided in the 1991 Air Quality Attainment Plan.

Table 1 - Federal and State Ambient Air Quality Standards and Attainment Status of Selected Pollutants in Santa Barbara County

Pollutant & Averaging Time	Standard		Attainment Status	
	Federal	State	Federal	State
Ozone 1 hour	0.12 ppm	0.09 ppm	Non-attainment ^a	Non-attainment ^a
NO ₂ Annual Average 1 hour	0.053 ppm ---	--- 0.25 ppm	Attainment	Attainment
CO 1 hour 8 hours	35 ppm 9 ppm	20 ppm 9 ppm	Attainment ^b Attainment	Attainment ^b Attainment
H ₂ S 1 hour	---	0.03 ppm	---	Attainment ^c
PM ₁₀ 24 hours AGM ^d AAM ^e	150 ug/m ³ --- 50 ug/m ³	50 ug/m ³ 30 ug/m ³ ---	Attainment --- Attainment	Non-attainment Non-attainment

Notes:

- a. Non-attainment for entire County. Based on monitoring data as of 1993, the County has achieved the Federal ozone standard and the APCD will be applying to the USEPA for re-designation to an "attainment area".
- b. "Hot spots" at congested intersections may violate standards during the peak hour.
- c. Recently designated as attainment.
- d. Annual Geometric Mean.
- e. Annual Arithmetic Mean.

2. Air Pollution Control District Rules and Regulations. The Santa Barbara County Air Pollution Control District (APCD) is the agency responsible for regulating stationary sources (businesses and industry) of air pollution in Santa Barbara County. Examples of businesses that emit air pollution include gasoline stations, auto body shops, dry cleaners, oil and gas facilities, and water treatment plants. The APCD regulates these and other businesses by issuing permits and adopting rules, as required by state and federal air pollution control laws.

The air quality thresholds are intended to provide guidance in evaluating the significance of adverse long-term air quality impacts from all sources, including businesses not regulated by the APCD and motor vehicles. These thresholds of significance are unrelated to the permitting requirements of the APCD and cannot be used to determine whether a project will need an APCD permit. For information on whether a project will require an APCD permit, please contact the Permitting Section Supervisor of the APCD. For assistance in applying the thresholds in this manual please contact the Supervisor of the Interagency Review Section of the APCD. Both section supervisors may be reached at (805) 961-8800.

3. The California Environmental Quality Act (CEQA). The air quality impact analysis in an environmental document required under CEQA should include the elements described in the APCD's Scope and Content of Air Quality Sections in Environmental Documents. This document is available upon request from the Interagency Review section of the APCD. Briefly, the air quality impact analysis in an Environmental Impact Report (EIR) should include:

- existing environmental setting of the area affected by the project, in terms of climate and current air quality;
- a discussion of all direct and indirect, long term and short term, air quality impacts of the proposed project and the classification of the significance of long-term impacts using established criteria;
- significant cumulative air quality impacts of the project;
- consistency of the project with local and regional plans, including the Air Quality Attainment Plan;
- mitigation measures to reduce or avoid potentially significant air quality impacts, including effectiveness of mitigation measures and discussion of residual impacts;
- feasible alternatives to the project which would reduce air quality impacts, including the air quality impacts of the "No Project" alternative and the environmentally superior alternative;
- potential growth inducing effects of the project on air quality;
- required air quality mitigation measures in the Mitigation Monitoring and Reporting Plan (MMRP).
- appendices containing all calculations and assumptions used in assessing long-term air quality impacts.

The air quality sections of Negative Declarations (NDs) should include a brief description of the air quality setting as it relates to project impacts, mitigation measures and inclusion of all air quality mitigation measures in the MMRP.

B. Determining Significance of Air Quality Impacts.

The two major criteria for determining if a project will have a potentially significant adverse air quality impact are listed below. These criteria are based on Appendix G of the State CEQA Guidelines. If the project meets either of the two listed criteria, the impacts must be discussed and analyzed in detail and appropriate mitigation measures must be identified. Section 3 provides the quantitative emission thresholds and screening tables to determine the significance of long-term (operational) impacts of the project. Sections 4 and 5 discuss cumulative impacts and consistency with the AQAP. Section 6 provides guidance on how other air quality considerations should be described.

A significant adverse air quality impact may occur when a project, individually or cumulatively, triggers any one of the following:

- interferes with progress toward the attainment of the ozone standard by releasing emissions which equal or exceed the established long-term quantitative thresholds for NO_x and ROC;
- equals or exceeds the state or federal ambient air quality standards for any criteria pollutant (as determined by modeling);

Cumulative air quality impacts and consistency with the policies and measures in the Air Quality Supplement of the Comprehensive Plan, other general plans, and the Air Quality Attainment Plan (AQAP) should be determined for all projects (i.e., whether the project exceeds the AQAP emission projections or growth assumptions).

The following issues should be discussed only if they are applicable to the project.

- Emissions which may affect sensitive receptors (e.g. children, elderly or acutely ill);
- Toxic or hazardous air pollutants in amounts which may increase cancer risk for the affected population; or
- Odor or another air quality nuisance problem impacting a considerable number of people.

C. Quantitative Emission Thresholds.

CEQA requires that the significance of a project's direct and indirect emissions be determined for both short-term (construction) and long-term (operational) impacts. If a project's air quality impacts are found to be significant, then mitigation measures will be required. Numeric emission thresholds of significance have been established for the ozone precursors NO_x and ROC. Criteria for triggering modeling have been established for carbon monoxide (CO). In order to determine if a project exceeds these quantitative thresholds, the expected emissions of these pollutants from the project must be calculated. Because calculations can be time consuming, the APCD has developed screening tools to identify projects not likely to exceed the thresholds. These sizes of projects are based on simple calculations that show the relationship between the size of a project and potential emissions.

If a project is smaller in size than the project sizes listed, project-specific emission calculations are generally not required. If the project is equal to or larger than any size listed, is not similar to any of the categories listed, or is subject to an APCD permit, then emission calculations may be required. Emission calculations in the environmental document must provide the methodology used to estimate the emissions, including input data, assumptions, and all calculations. Emission calculation methods or modeling inputs using URBEMIS, EMFAC, CALINE or other air quality analysis tools must be fully documented so that the calculations or modeling can be duplicated and confirmed by the APCD. In order to be given emission reduction credits for mitigation measures which can be quantified, emission calculations must be approved by the APCD.

- 1. Short-term/Construction Emissions.** Short-term air quality impacts generally occur during project construction. CEQA requires a discussion of short-term impacts of a project in the environmental document. The reasoning for considering short-term impacts insignificant is provided below.

No quantitative threshold has been established for short-term, construction related PM₁₀ (which is 50 percent of total dust). However, this impact should be discussed in all environmental documents for projects involving ground disturbance. Dust control measures are required under the County of Santa Barbara's Grading Ordinance for most projects. Some projects have the potential for construction-related dust to cause a nuisance. Also, Santa Barbara County violates the state standard for PM₁₀. Therefore, dust mitigation measures are required for all discretionary construction activities. The standard dust mitigation measures are based on policies in the 1979 AQAP and are listed in a separate implementation document, Air Quality Analysis for EIRs, available from Planning and Development.

The short-term thresholds for NO_x and ROC emissions from construction equipment were

not established. Emissions of NO_x from construction equipment in the County are estimated at 1000 tons per year of NO_x. When compared to the total NO_x emission inventory for the County of approximately 17,000 tons per year, construction emissions comprise approximately six percent of the 1990 county-wide emission inventory for NO_x (Santa Barbara County 1993 Rate-of Progress Plan). In general, this amount is considered insignificant.

2. Long-term/Operational Emission Thresholds. Long-term air quality impacts occur during project operation and include emissions from any equipment or process used in the project (e.g., residential water heaters, engines, boilers, operations using paints or solvents) and motor vehicle emissions associated with the project. These emissions must be summed in order to determine the significance of the project's long-term impact on air quality.

a. Ozone Precursors (NO_x and ROC). A proposed project will not have a significant air quality effect on the environment, if:

Operation of the project will:

- emit (from all project sources,¹ mobile and stationary), less than the daily trigger² for offsets set in the APCD New Source Review Rule, for any pollutant; and
- emit less than 25 pounds per day of oxides of nitrogen (NO_x) or reactive organic compounds (ROC) from motor vehicle trips only; and
- not cause or contribute to a violation of any California or National Ambient Air Quality Standard (except ozone); and
- not exceed the APCD health risk public notification thresholds adopted by the APCD Board; and
- be consistent with the adopted federal and state Air Quality Plans.

Long-term project emissions primarily stem from motor vehicles associated with the land use project and stationary sources which may require permits from the APCD. Examples of stationary emission sources include: gas stations, auto body shops, dry cleaners, oil and gas production and processing facilities, and water treatment facilities. Some stationary sources such as residential heating and cooling equipment, wood burning stoves and fireplaces, or other individual appliances do not require permits from the APCD. Emissions from wood burning stoves may be significant for housing developments of 250 homes or more. Emissions from appliances may be significant for developments of about 1000 homes or for commercial projects. These emissions should be included in the operational phase emission evaluation. The APCD should be contacted for assistance with estimating direct emissions from stationary sources. Stationary source emissions must be added to transportation source emissions prior to applying the project-specific threshold of significance.

b. Carbon Monoxide (CO). A project will have a significant air quality impact if it causes, by adding to the existing background CO levels, a carbon monoxide "hot spot"

¹ Portable equipment registered under the California Air Resources Board Statewide Portable Equipment Registration Program (PERP) shall not be included a proposed project's emission total. Emissions from these sources are in compliance with the ARB PERP program, and are exempt from APCD permits.

² Where projects exceed the offset trigger, the significant effect shall be considered mitigable to insignificance where APCD rules require offsets and net emissions after offsets are less than the trigger for offsets.

where the California one-hour standard of 20 parts per million carbon monoxide is exceeded. This typically occurs at severely congested intersections.

Project Screening for CO Impacts:

- 1) If a project contributes less than 800 peak hour trips, then CO modeling is not required.
- 2) Projects contributing more than 800 peak hour trips to an existing congested intersection at level of service (LOS) D or below, or will cause an intersection to reach LOS D or below, may be required to model for CO impacts. However, projects that will incorporate intersection modifications to ease traffic congestion, are not required to perform modeling to determine potential CO impacts.

CO concentrations at congested intersections can be estimated using air quality impact modeling such as CALINE4 or similar models. The CALINE4 model requires intersection-specific, operational data on vehicles per hour and hourly departure volumes obtained from a project-specific traffic study. The methodology is described in the Air Quality Analysis for EIRs, available from the Planning and Development Department.

D. Cumulative Impacts.

Cumulative air quality impacts are the effect of long-term emissions of the proposed project on the projected regional air quality or localized air pollution problems in the County. As discussed in the County's 1993 CEQA Guidelines (Guidelines for the Implementation of the California Environmental Quality Act of 1970, as amended (revised January 2008)), the cumulative contribution of project emissions to regional levels should be compared with existing programs and plans, including the AQAP. To evaluate the cumulative impacts of localized pollutants, the contribution of the project's emissions to background levels should be considered. Due to the county's non-attainment status for ozone and the regional nature of the pollutant, if a project's total emissions of the ozone precursors, NO_x or ROC, exceed the long-term threshold, then the project's cumulative impacts will be considered significant. For projects that do not have significant ozone precursor emissions or localized pollutant impacts, emissions have been taken into account in the AQAP growth projections and therefore, cumulative impacts may be considered to be insignificant.

E. Consistency with the AQAP and Other Planning Documents

Consistency with local and regional plans, such as the Air Quality Attainment Plan (AQAP), the Congestion Management Plan (CMP) and the Regional Transportation Plan (RTP) is required under CEQA. Under the Federal Clean Air Act, projects which receive federal funding or are subject to federal approval must show conformity with the State Implementation Plan, of which the AQAP is a part. Proposed projects subject to AQAP consistency determinations include a wide range of activities such as commercial, industrial, residential, and transportation projects. By definition, consistency with the AQAP, for the projects subject to these guidelines, means that stationary and vehicle emissions associated with the project are accounted for in the AQAP's emissions growth assumptions. The AQAP generally relies on the land use and population projections provided in the Santa Barbara County Association of Governments' Regional Growth Forecast. The current criteria for determining consistency of these projects are explained in the implementation document, Air Quality Analysis for EIRs.

Consistency with the Air Quality Supplement of the County's Land Use Element must also be analyzed. The air quality policies in the Comprehensive Plan encourage mixed use development and alternative

transportation modes. Specifically, project alternatives for proposed housing projects should consider land development design policies aimed at reducing air pollutant emissions, such as pedestrian-oriented and transit-oriented development (TOD). The TOD concept involves a mixed-use community within a typical 2,000-foot walking distance of a transit stop and core commercial area. The design, configuration and mix of uses emphasize a pedestrian-oriented environment and reinforce the use of alternative modes of transportation. TOD designs can help to reduce the number of auto trips and vehicle miles traveled by creating opportunities to walk and bike, while enhancing the area's quality of life and protecting affordable housing goals. The APCD may be contacted for reference material on these concepts. The APCD also encourages early consultation prior to the CEQA determination by the lead agency.

F. Other Air Quality Issues Which May Be Applicable.

The following issues should be discussed if they are applicable to the project.

1. **Siting Criteria for Schools.** CEQA Section 21151.8 requires school districts to consider the impacts of siting a new school within one-quarter mile of existing facilities that emit toxic or hazardous air pollutants. The Interagency Review Section of the APCD should be contacted in writing for assistance in identifying the locations of such facilities within the proximity of proposed school sites. The APCD should also be contacted for assistance with health risk assessment methodology, if necessary.
2. **Toxic or Hazardous Air Pollutants.** Some classifications of projects are more likely than others to emit toxic pollutants. Table 2 lists examples of commercial or industrial activities that may be associated with toxic air pollutants. This list is not all inclusive.

TABLE 2 - Examples of Projects Which May Emit Toxic Air Pollutants

ACTIVITY	CHEMICAL
Gas Stations	Benzene
Dry Cleaning	Tetrachloroethylene (Perchloroethylene) Carbon Tetrachloride
Medical Sterilization	Ethylene Oxide
Rubber/ Plastic Fabrication	Xylene
Electronic and Parts Manufacturing	1,1,1 Trichloroethylene and other chlorinated hydrocarbon solvents
Landfills	Vinyl chloride, Benzene, etc.

If any of these or other projects which emit toxic air pollutants, such as auto body shops, funeral homes etc., are involved, the APCD should be contacted for information. For most of these projects an APCD permit will be required. Health risk management decisions regarding the project will be addressed during the APCD permitting process to ensure that toxic emissions from the project are reduced to the maximum extent feasible.

3. **Nuisance.** Construction projects have a high probability of creating objectionable dust impacts. Also fugitive dust from construction is roughly 50 percent particulate matter that is 10 microns (or less) in diameter (PM₁₀). PM₁₀ is a criteria pollutant with adverse health impacts. Sensitive receptors may be affected because of their location downwind. Dust mitigation measures are required under the County's Grading Ordinance for all projects involving earth moving activities over 50 cubic yards regardless of location.

If a project has the potential to cause an odor or other long-term air quality nuisance problem impacting a considerable number of people, the environmental document (Initial

Study, ND or EIR) should describe the history of complaints from pre-existing conditions, the number of people affected and other relevant information so that the impacts can be mitigated where feasible. This information may be available in APCD files for certain areas. New projects that have a high probability of emitting objectionable odors or new developments that may be affected because of their location downwind should be identified early in the Initial Study. This may prevent nuisance problems after the project is built. Odor issues can sometimes be resolved by changing the location of the equipment or the process. Nuisance impacts need not be quantified at the initial study stage and may be analyzed qualitatively on a case by case basis.

BIBLIOGRAPHY

1. Santa Barbara County Air Pollution Control District (SBCAPCD), December 1991. 1991 Air Quality Attainment Plan: State Ozone Standard Countywide.
2. SBCAPCD and Santa Barbara County Association of Governments, 1993. 1993 Rate-of-Progress Plan: Federal Ozone Standard Countywide.
3. SBCAPCD, 1979. 1979 Air Quality Attainment Plan.
4. SBCAPCD, May 1992. Rules and Regulations.
5. SBCAPCD, March 1992. 1990 Annual Air Quality Report.
6. SBCAPCD, June 1991. Particulate Matter Emission Reduction Study.
7. Santa Barbara County Association of Governments (SBCAG), 1991. Congestion Management Plan.
8. SBCAG, August 1989, Forecast '89: Santa Barbara County Regional Growth Forecast 1985-2005.
9. U.S. Environmental Protection Agency (EPA), September 1985, Compilation of Air Pollutant (AP-42) Emission Factors. Vol. II, Fourth edition.
10. Santa Barbara County Resource Management Department, Division of Environmental Review, September 1990. Environmental Thresholds and Guidelines Manual.
11. California Air Resources Board (CARB), 1990. Air Quality Analysis Tools (AQAT-3).
12. CARB, November 1986. Methodology To Calculate Emission Factors For On-Road Motor Vehicles.
13. California Department of Transportation (CalTrans), 1986. CALINE4- A Dispersion Model for Predicting Air Pollution Concentrations near Roadways.
14. Institute of Transportation Engineers (ITE), 1991. Trip Generation.
15. City of San Diego, 1992. Transit-Oriented Development Design Guidelines.

6. BIOLOGICAL RESOURCES *(Approved by the Board of Supervisors September 27, 1994)*

A. Introduction.

Federal and State laws and adopted County policies require the protection of natural habitats and associated wildlife and vegetation in recognition of their many values, including maintaining a healthy balance between urban built areas and supportive natural environment, nutrient recycling, providing for watershed protection, protection against erosion, cleansing of air and water, food chain support, scientific and medical research, education, recreation, aesthetics, and for the intrinsic value of wildlife and vegetation and their natural ecosystems.

Santa Barbara County has a wide diversity of habitat types, including chaparrals, oak woodlands, wetlands and beach dunes. Preservation of large contiguous habitat areas is the key to preserving biodiversity and avoiding additional species becoming rare, endangered or extinct.

Due to the complexities of ecosystems and the many factors involved in assessing the value of biological resources and project impacts, general qualitative guidelines rather than numerical thresholds are provided.

B. Legal Authority.

- 1. CEQA Guidance for Biological Impact Assessment.** The following sections of the State CEQA Guidelines provide general direction for the evaluation of biological resource impacts as a part of the environmental review of proposed projects.

California Environmental Quality Act (CEQA) Section 15065 states that a Lead Agency shall find that a project may have a significant effect on the environment and thereby require an Environmental Impact Report (EIR) to be prepared for the project where the project has 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, or reduce the number or restrict the range of a rare or endangered plant or animal.

CEQA Appendix G states that a project will normally have a significant effect on the environment if it will:

- “(a) Conflict with adopted environmental plans and goals of the community where it is located;
- (c) Substantially affect a rare or endangered species of animal, plant or the habitat of the species;
- (d) Interfere substantially with the movement of any resident or migratory fish or wildlife species; and
- (e) Substantially diminish habitat for fish, wildlife or plants.”

- 2. Federal and State Requirements for Protection of Biological Resources.** Environmental impact analysis and mitigation needs to take into account Federal and State biological resource regulations.. The Federal Endangered Species Act and California Endangered Species Act formally list plant and animal species determined to be rare, threatened or endangered, or candidate species, and establish regulations for protecting these species and their habitats. Additional information regarding these statutes is provided in a separate technical document (Planning and Development Department Biological Resources Technical

References, 1994).

Other federal statutes include the National Environmental Policy Act (NEPA), the Clean Water Act Section 404 (for protection of wetlands), Bald Eagle Protection Act, Migratory Bird Treaty Act, Executive Order 11990 (wetlands protection), Rivers and Harbors Act Section 10, Marine Protection, Sanctuary and Research Act, Marine Mammal Protection Act, and Section 1601 and 1603 Stream Alteration Agreements.

3. **County Biological Resources Policies.** Requirements for the protection of biological resources in the unincorporated area of Santa Barbara County are provided by the Comprehensive Plan Conservation Element, Environmental Resource Management Element (ERME), Land Use Element, Community Plans, and the Coastal Land Use Plan. These documents identify sensitive habitats and species, and provide measures to direct project design and policies to protect biological resources.

C. Guidelines for Assessment of Biological Resources Impacts.

1. **Initial Study Review Process.** The term "biological resources" refers to plant and animal species and habitats that support plant and animal species.

The value of a habitat and the resources present on the project site and potential project impacts are assessed preliminarily during the initial study review process. The first task in the assessment of biological impacts is an evaluation of the plant and animal resources on the project site and the second focuses on the project impact itself, using a series of assessment factors. The initial study evaluation determines whether an EIR or Mitigated Negative Declaration should be prepared based upon substantial evidence (not public controversy) that there is the potential for significant adverse biological impacts to occur as a result of a proposed project.

Based on a preliminary site assessment and review of existing historical resource information (designated environmentally sensitive habitat (ESH) areas, biological resource maps, reports, surveys, and Natural Diversity Data Base maps, available in the Planning and Development Department), staff utilizes the methodologies described below to determine whether resources on a site are biologically valuable, and whether a project may result in a significant impact to biological resources. In some instances a biological consultant survey of the site is required to determine the presence or absence of sensitive species and the value of habitat on and surrounding the project site, and to identify potential project impacts and feasible measures which could be incorporated into the project design to avoid or minimize the potentially significant impacts. Guidelines for performance of biological studies and sensitive resource definitions are provided in a separate technical document.

The determination of impact is done on a case-by-case basis. Because of the complexity of biological resource issues, substantial variation can occur between cases. The following sections identify questions and factors used in assessing the value of biological resources, and the significance of project impacts.

2. **Evaluation of Resources on the Project Site.**

- a. **Resources Inventory.**

- (1) What biological communities are on the site? What size area?
- (2) Is the habitat type relatively common? Is it rare and occurring in only a few places in the region, or significantly declining in extent and/or quality? Is the

habitat designated as an ESH area on County planning documents, or designated as "critical habitat" for listed species by Federal or State agencies?

- (3) Is the site in an urban, rural or outlying area? What are the uses surrounding the site? Is the habitat isolated or is it contiguous with adjacent habitat or close enough to provide a link between habitats?
- (4) Does the habitat support resident species or migratory species? Are there protected species (e.g., endangered or threatened), or species of candidate, special, or local concern or healthy rare species?

b. Condition and Quality.

- (1) Is the habitat pristine or disturbed? How much or to what degree?
- (2) How biologically productive is it? Does it support an especially rich and diverse plant and/or wildlife population?
- (3) Is the habitat resource (including the surrounding area if it is related) large enough to be viable?

3. Evaluation of Project Impacts. Assessment of impacts must account for both short-term and long-term impacts. Thus the assessment must account for items such as immediate tree removal and longer-term, more subtle impacts such as interruption of the natural fire regime or interference with plant or animal propagation.

a. Types of Impacts to Biological Resources. Disturbance to habitats or species may be significant, based on substantial evidence in the record (not public controversy or speculation), if they substantially impact significant resources in the following ways:

- (1) Substantially reduce or eliminate species diversity or abundance
- (2) Substantially reduce or eliminate quantity or quality of nesting areas
- (3) Substantially limit reproductive capacity through losses of individuals or habitat
- (4) Substantially fragment, eliminate, or otherwise disrupt foraging areas and/or access to food sources
- (5) Substantially limit or fragment range and movement (geographic distribution or animals and/or seed dispersal routes)
- (6) Substantially interfere with natural processes, such as fire or flooding, upon which the habitat depends.

b. Less Than Significant Impacts. There are many areas in the County where there is little or no importance to a given habitat and it is presumed that disruption would not create a significant impact. Examples of areas where impacts to habitat are presumed to be insignificant include:¹

- (1) Small acreages of non-native grassland if wildlife values are low.
- (2) Individuals or stands of non-native trees if not used by important animal species such as raptors or monarch butterflies.

¹ Pursuant to CEQA, a presumption based upon County thresholds that a project's impact is insignificant is rebutted if there is substantial evidence in light of the whole record before the lead agency that the project may have a significant impact on the environment (Pub. Res. Code §21082.2).

- (3) Areas of historical disturbance such as intensive agriculture.
- (4) Small pockets of habitats already significantly fragmented or isolated, and degraded or disturbed.
- (5) Areas of primarily ruderal species resulting from pre-existing man-made disturbance.

c. Impact Assessment Factors. In addition to the criteria listed in a. "Types of Impacts to Biological Resources" above, the following questions and factors are used in assessing the significance of project impacts on biological resources.

(1) Size.

How much of the resource in question both on and off the project site would be impacted? (percentage of the whole area and square footage and/or acreage are both useful to know)

How does the area or species that would be impacted relate to the remaining populations off the project site? (percentage of total area or species population, either quantitatively or qualitatively.)

(2) Type of Impact.

Would it adversely indirectly affect wildlife (light, noise, barriers to movement, etc.)?

Would it remove the resource or cause an animal to abandon the area or a critical activity (e.g., nesting) in that area?

Would it fragment the area's resource?

(3) Timing.

Would the impact occur at a critical time in the life cycle of an important plant or animal (e.g., breeding, nesting, or flowering periods)?

Is the impact temporary or permanent? If it is temporary, how long would the resource take to recover?

Would the impact be periodic, of short duration, but recur again and again?

D. Habitat-Specific Impact Assessment Guidelines.

The following section provides additional impact assessment guidelines specific to several biological communities. These guidelines are to be used in conjunction with the general impact assessment guidelines described in Section III. (Note: Not all habitat types found in Santa Barbara County are addressed by these habitat-specific guidelines. Habitat types not addressed here are assessed with the general impact assessment guidelines in Section III.)

1. Wetlands.

a. Description. Wetlands are among the most biologically productive of habitats, and the County's wetlands have been diminished both in areal extent and quality from the historic condition. As a result, naturally-occurring wetlands are an important resource, and projects with potential impacts to wetlands must be carefully evaluated. Examples of wetlands include coastal salt and brackish marshes, fresh water marshes, and vernal pools. Special cases include seasonal wetlands, vegetated flats, inter-dunal swale

wetlands, and vegetated river bars and flats (riparian areas).

- b. Definition.** For the purposes of determining potentially significant effect, Santa Barbara County uses the following wetland definition that has been adopted by most resource protection agencies (U.S. Fish and Wildlife Service, the California Coastal Commission, the California Fish and Game Commission and the California Department of Fish and Game).² This definition reads:

"For purposes of this classification wetlands must have one or more of the following three attributes:

- a) At least periodically, the land supports predominantly hydrophytes, that is plants adapted to moist areas.
- b) The substrate is predominantly un-drained hydric soil, and
- c) The substrate is non soil and is saturated with water or covered by shallow water at some time during the growing season of each year. (Cowardin 1979)"

In order to ensure that wetland protection standards are applied equitably to affected property owners, wetlands which have only one of the defining three characteristics, especially those defined only by seasonal ponding, require careful review to ensure that highly disturbed areas with artificially compacted soils which do not have true wetland characteristics are not mistakenly identified as wetlands.

- c. Wetland/Upland Boundary Definition.** The same category used to delineate wetland is used to delineate the boundary between wetland and upland.³ The upland limit of wetland is designated as 1) the boundary between land with predominantly hydrophytic cover and land with predominantly mesophytic (semi-dry) or xerophytic (dry) cover; or 2) the boundary between soil that is predominantly hydric and soil that is predominantly nonhydric; or 3) in the case of wetlands without vegetation or soil, the boundary between land that is flooded or saturated at some time each year and land that is not.

- d. Wetland Impact Assessment Guidelines.** The following types of project-created impacts may be considered significant:

- (1) Projects which result in a net loss of important wetland area or wetland habitat value, either through direct or indirect impacts to wetland vegetation, degradation of water quality, or would threaten the continuity of wetland-dependant animal or plant species are considered to have a potentially significant effect on the environment (California Environmental Quality Act: Guidelines, Appendix G; items c, d, and t).
- (2) Wildlife access, use, and dispersal in wetland habitats are key components of their ecosystem value. For example, many upland species of wildlife could not persist without access to water. Movement between contiguous habitats through riparian areas (e.g.: from mountainous chaparral to valley grassland or coastal

² It is the goal of Santa Barbara County to maintain a definition of wetlands consistent with Federal and State resources agencies listed above.

³ Methodologies used in delineating wetlands are consistent with those utilized by Federal and State resources agencies referenced above.

mesa) allows for many species to continue to persist and prevents genetic isolation. Projects which substantially interrupt wildlife access, use and dispersal in wetland areas would typically be considered to have potentially significant impacts.

- (3) The hydrology of wetlands systems must be maintained if their function and values are to be preserved. Therefore, maintenance of hydrological conditions, such as the quantity and quality of run-off, etc., must be assessed in project review.
- e. **Coastal Salt Marsh Impact Assessment Guidelines.** Project-created impacts may be considered significant due to the potential to change species composition and habitat value as outlined below.
- (1) Substantial alteration of tidal circulation or decrease of tidal prism.
 - (2) Adverse hydrologic changes (e.g., altered freshwater input), substantial increase of sedimentation, introduction of toxic elements or alteration of ambient water temperature.
 - (3) Construction activity which creates indirect impacts such as noise and turbidity on sensitive animal species, especially during critical periods such as breeding and nesting.
 - (4) Disruption of wildlife dispersal corridors.
 - (5) Disturbance or removal of substantial amounts of marsh habitats. Because of the high value and extremely limited extent of salt marsh habitat in the County, small areas of such habitat may be considered significant.
- f. **Vernal Pools Impact Assessment Guidelines:** The following types of project-related impacts may be considered significant:
- (1) Direct removal of vernal pool or vernal pools complex.
 - (2) Direct or indirect adverse hydrologic changes such as altered freshwater input, changes in the watershed area or run-off quantity and/ or quality, substantial increase in sedimentation, introduction of toxic elements or alteration of ambient water temperature.
 - (3) Disruption of larger plant community (e.g., grassland) within which vernal pool occurs, isolation or interruption of contiguous habitat which would disrupt animal movement patterns, seed dispersal routes or increase vulnerability of species to weed invasion or local extirpation. For example, fragmentation of habitat may interrupt interaction between the habitat and the organisms within the pools (pollination, seed, invertebrate and vertebrate dispersal, provision of drinking and bathing water, etc.). These types of direct and indirect impacts are potentially significant.

2. Riparian Habitats.

- a. **Description.** Riparian habitat is the terrestrial or upland area adjacent to freshwater bodies, such as the banks of creeks and streams, the shores of lakes and ponds, and aquifers which emerge at the surface such as springs and seeps (Bowland and Ferren 1992). A rich assemblage of wildlife series, including birds, mammals and amphibians

are found in riparian habitats. In Santa Barbara County, riparian habitat occurs in and along the County's four major rivers (Santa Ynez, Santa Maria, Cuyama and Sisquoc) and in and along the County's many creeks and streams. This habitat can also occur along arroyos and barrancas, and other types of drainages throughout the County.

b. Riparian Impact Assessment Guidelines, The following types of project-related impacts may be considered significant:

- (1) Direct removal of riparian vegetation.
- (2) Disruption of riparian wildlife habitat, particularly animal dispersal corridors and or understory vegetation.
- (3) Intrusion within the upland edge of the riparian canopy (generally within 50 feet in urban areas, within 100 feet in rural areas, and within 200 feet of major rivers listed in the previous section), leading to potential disruption of animal migration, breeding, etc. through increased noise, light and glare, and human or domestic animal intrusion
- (4) Disruption of a substantial amount of adjacent upland vegetation where such vegetation plays a critical role in supporting riparian-dependent wildlife species (e. g., amphibians), or where such vegetation aids in stabilizing steep slopes adjacent to the riparian corridor, which reduces erosion and sedimentation potential.
- (5) Construction activity which disrupts critical time periods (nesting, breeding) for fish and other wildlife species.

3. Native Grasslands.

a. Description: Native Grassland in California once occurred over 8 million acres in the Central Valley and in scattered patches along the Coast Ranges (Heady, 1977). Few stands of native grasslands remain in the state and the habitat is considered rare both in the state and within the county.

b. Native Grassland Habitat Impact Assessment Guidelines:

- (1) For purposes of resource evaluation in Santa Barbara County, a native grassland is defined as an area where native grassland species comprise 10 percent or more of the total relative cover.^{4,5}
- (2) Removal or severe disturbance to a patch or patches of native grasses less than one-quarter acre, which is clearly isolated and is not a part of a significant native grassland or an integral component of a larger ecosystem, is usually considered insignificant.

⁴ The California Department of Fish and Game, Natural Heritage Division uses the 10 percent relative cover figure in determining acreages of remaining native grasslands (Keeler-Wolf, Natural Diversity Data Base, personal communication May 1992). (Relative cover is the cover of a particular species as a percentage of total plant cover of a given area. [Barbour, Burk & Pitts 1980].)

⁵ Native grasslands which are dominated by perennial bunch grasses such as purple needlegrass (*Stipa pulchra*) tend to be patchy (the individual plants and groups of plants tend to be distributed in patches). Therefore, for example, where a high density of small patches occur in an area of one acre, the whole acre should be delineated if native grassland species comprise 10 percent or more of the total relative cover, rather than merely delineating the patches that would sum to less than one acre.

4. Oak Woodlands and Forests.

- a. **Description.** There are three primary types of oak woodlands in Santa Barbara County: Valley Oak, Coast Live Oak, and Blue Oak woodlands. The number, type, and density of oak trees, and the relationship between trees and understory are principal characteristics which define the various types of woodlands. Oak habitats support a diverse wildlife population, and offer abundant resources to wildlife including food sources, shade in summer, shelter in winter, perching, roosting, nesting, and food storage sites.
- b. **Impact Assessment Guidelines for Woodlands and Forest Habitat Areas.**⁶ Project-created impacts may be considered significant due to changes in habitat value and species composition such as the following:
 - (1) Habitat fragmentation.
 - (2) Removal of understory.
 - (3) Alteration to drainage patterns.
 - (4) Disruption of the canopy
 - (5) Removal of a significant number of trees that would cause a break in the canopy or disruption in animal movement in and through the woodland

5. Impact Assessment for Individual Native Trees.⁶

- a. **Description.** Native specimen trees, regardless of size, are potentially significant, and rare native trees, which are very low in number or isolated in distribution (such as Island Oak) may be particularly significant. This significance evaluation is done on a case-by-case basis and considers tree size, numbers, location, relationship to habitat, etc.
- b. **Definition.** Specimen trees are defined, for biological assessment purposes, as mature trees that are healthy and structurally sound and have grown into the natural stature particular to the species.
- c. **Native Tree Impact Assessment.** In general, the loss of 10 percent or more of the trees of biological value on a project site is considered potentially significant.⁷

E. General Mitigation Guidelines for Biological Impacts.

- 1. **Mitigation Hierarchy.** The following general approaches to reducing biological impacts are presented in the order of their effectiveness.
 - a. **Avoidance.**

Avoid direct or indirect impacts to significant biological resources through project design.

⁶ The impact assessment guidelines for oak trees, woodlands and forest habitat do not apply to non-discretionary level oak tree removal of protected and unprotected size under the Grading Ordinance Guidelines for Native Oak Tree Removal that are incorporated as Appendix A in County Code, Chapter 14. Non-discretionary-level oak tree removal of protected and unprotected size that is subject to and in compliance with these Guidelines has been previously analyzed in the program EIR, 00-EIR-07 RV1.

⁷ The number of trees present onsite from which the 10 percent is measured may be calculated either by counting individual trees or by measuring the area of the tree canopy with a planimeter.

Focus on maintaining large, contiguous habitat areas and animal movement corridors. A project design which clusters development on a relatively limited portion of the project site may reduce the habitat area disturbed by the project.

b. Onsite Mitigation.

Minimize or reduce impacts through on-site design and resource protection measures.

Measures may include vegetative spatial buffer between project and habitat areas; revegetation; habitat enhancement; erosion and water quality protection; on-site replacement/compensation; maintenance and management measures such as fencing, weed control, use of building envelopes, and dedication of areas through open space or conservation easements or grant deed of development rights; short-term measures to protect against construction impacts (e.g., fencing, timing of construction to avoid nesting season).

c. Off-Site Mitigation.

Compensate for on-site impacts through off-site measures.

When avoidance or on-site mitigation is infeasible or inadequate to reduce impacts, measures such as those listed under on-site mitigation can be considered in off-site locations, or may be accomplished through in-lieu fees. Off-site approaches may be appropriate at times if a greater ecological value may be clearly gained than with on-site mitigation. (i.e., where on-site habitat is of low quality or highly fragmented).

- 2. Habitat Replacement/Compensation Guidelines.** The mitigation approach of replacing habitat either on-site or off-site, to compensate for habitat loss, is generally not a preferred approach because it always results in some habitat loss (either short-term or long-term), and because prospects for successful habitat replacement are problematic.

Replacement mitigation should involve the same habitat type, location(s) within the same watershed and as close as possible to the site of impact, and should result in comparable and compensating size and habitat value.

Beneficial ecological restoration projects, where the purpose of the project is to enhance or restore biological or habitat resources, compensate replacement at a minimum ratio of 1:1. Refer to the *County Guidelines for the Implementation of the California Environmental Quality Act of 1970, As Amended*, revised January 8, 2008, for the definition and requirements for beneficial ecological restoration projects.

3. Consultation on Mitigation and Project Design.

- a. Biological Information.** County biological information available to project applicants, consulting biologists and the public by appointment includes resource and wetland maps, historical aerial photographs, and a library of previous biological surveys and reports. More specific mitigation guidance is provided in a separate technical document augmenting these Guidelines.

- b. Consultants.** County staff is available through consultations and pre-application meetings to advise project applicants on project design measures to minimize biological impacts. Project sponsors may consult informally with California Department of Fish and Game and/or area consulting biologists at the preliminary review or initial study stage to determine what wildlife and vegetation resource information is available or

needed and how the necessary information can be obtained.

F. Technical Background Document.

A separate technical document (Appendix A) contains the following additional information:

- A. Summary of Biological Resources Statutes
- B. Biological Survey Guidelines
- C. Detailed Biological Habitat Descriptions
- D. Biological Mitigations
- E. References

7. COASTAL RESOURCES (SEAWALL/COASTAL PROTECTION POLICY)

INTRODUCTION

On April 10, 1990 the Board of Supervisors unanimously approved a new policy which requires that EIRs be prepared for seawalls and other coastal protection structures. These documents would include extensive analysis of cumulative effects and regional issues for which a given project would be involved. Concern over a potential proliferation of seawalls along the south coast led to the adoption of this policy. Note that infill structures would not be subject to the EIR requirement unless warranted by site specific impacts.

A. Administrative Policy

- Coastal Units.** For purposes of seawall review, it is proposed that the unincorporated portion of the South Coast be divided into 10 units as shown on the attached map and listed below:

Coastal Unit	Location
Point Conception	VAFB to Gaviota
Gaviota	Gaviota to Eagle Canyon
Ellwood	Eagle Canyon to Coal Oil Point
Isla Vista	Coal Oil Point to UCSB
Goleta	UCSB to More Mesa
Hope Ranch	More Mesa to the City of Santa Barbara
Montecito	City of Santa Barbara to Sheffield Drive
Summerland	Sheffield Drive to Loon Point
Sandyland	Loon Point to the City of Carpinteria
Rincon Point	City of Carpinteria to the Ventura County line

Note: No coastal units were defined north of the southern boundary of Vandenberg Air Force Base (VAFB) because the presence of VAFB, the State Park at Point Sal and the Guadalupe Dunes will preclude private coastal development under County jurisdiction for the foreseeable future. Additionally, no coastal unit was defined for UCSB because they are a separate state jurisdiction.

Each unit was chosen primarily on the basis of similar geologic/geomorphic character.

- Infill Structures.** The administrative policy requiring extensive analysis of cumulative effects and regional coastal issues would not apply to infill coastal protection structures. A limited infill seawall or coastal protection structure is one which is limited in length and would be connected to an existing similar structure on each end. Infill protective structures, due to the potential for environmental impacts, would still require preparation of a site specific environmental document.
- Scope of Review.** Cumulative impact analysis for the identified stretches of beach would address geologically similar areas, would contain consistent design criteria, and would analyze the full range of alternatives to the construction of seawalls and other coastal protection structures to address coastal process/bluff retreat issues. These options could include sand replenishment, coastal protection structures, phased relocation or abandonment of bluff top homes, etc. The goal of requiring extensive cumulative analysis would be to

address the potential for regional impacts, insure the implementation of a consistent approach to coastal processes for each section of coast, and to implement standard mitigation measures. An additional goal would be to integrate the policies and findings of all seawall EIR's in order to provide the most consistent approach possible for the County as a whole. In the ideal situation, an EIR addressing a given stretch of beach could be used as a base environmental document for the processing of future coastal process/bluff retreat measures required along that stretch of coast. Each seawall EIR should address the potential impacts for the full range of alternatives (sand replenishment, seawalls, home relocation/abandonment, etc.), cumulative impacts, and specifically discuss the following:

- a. Geology of the rocks which underlie a 500 foot wide strip along the coast.
- b. Sea bluff retreat rates.
- c. Potential for large-scale landslides.
- d. Effects of coastal protection structures on littoral sand supply.
- e. Effects of sea level rise due to global warming.
- f. Impacts on beach access.
- g. Aesthetic impacts.
- h. Biological Impacts (offshore, coastal strand and bluff, etc.).
- i. Coastal protection alternatives.
- j. General design criteria and standard mitigation measures for seawalls.
- k. Available on and offshore sand sources.

Procedurally, seawall EIRs would provide general guidelines for implementation of the particular coastal process/bluff retreat program for a given section of coast. The findings of each seawall EIR would provide guidance to County decision-makers and coastal homeowners on the acceptable methods of addressing coastal process issues within a given coastal unit. Actions taken by homeowners or the County to address coastal process issues that are consistent with the findings of the EIR for a previously reviewed coastal unit would not require major additional environmental review. Alternatively, should an application for the alteration of coastal processes contain design features which are inconsistent with those provided in a seawall EIR previously prepared for that coastal unit, the application would be subject to additional environmental review through an Addendum or a Supplement to the previous EIR.

This process will allow the decision-makers to adequately evaluate the regional issue of coastal processes/bluff retreat from a long term and regional perspective.

B. Evaluation Criteria for Temporary Foundation Improvements on Seacliff Parcels in Isla Vista. (*Prepared by Brian R. Baca, Registered Geologist, December 1, 1992*)

These "Evaluation Criteria" (formerly named "Design Guidelines") have developed over the past several months during the review of several proposed projects located on Del Playa Drive in Isla Vista. Each of these projects involved the installation of underground foundation improvements with the primary feature being 35 - 40 foot long vertical caissons (a caisson is a cylindrical, steel-reinforced concrete piling). These criteria identify design parameters and mitigation measures which, if incorporated into the project description by the applicant, may allow for the preparation

of a Negative Declaration for the project (i.e., the potential for significant impacts and the need for an EIR would be avoided). These criteria follow the intent of State CEQA Guidelines section 15070(b) which describes the Mitigated Negative Declaration process. Numerous applications similar to the cases now under review are expected to be filed with the County within the next several years. The Evaluation Criteria are intended to be a standard under which each is to be reviewed. The permitting process would involve a discretionary Special Use Permit which would authorize installation and subsequent removal followed by implementing ministerial Coastal Development Permits at the time of construction and at the time of removal.

1. Introduction. These evaluation criteria address two distinct areas of County review of proposed temporary foundation improvements including:

a. Review of environmental impacts. The assessment (and avoidance) of environmental impacts on the bluff face and the beach upon the exposure of the improvements due to continuing retreat of the sea cliff.

b. Safety hazards. The removal of elements of the proposed improvements which are undermined by ongoing erosional processes such that they become unstable and hazards to public safety. The criteria (or guidelines) listed below are intended to allow an applicant to design a project such that significant environmental impacts could be avoided for the following issue areas in the absence of evidence of unique circumstances indicating a potential for project-specific or cumulative significant impacts:

- (1) Aesthetics
- (2) Increased erosion of adjacent properties
- (3) Long-term loss of beach width (i.e. lateral access impacts)
- (4) Erosion of the bluff face during construction and removal activities

The principles underlying these criteria is that the proposed foundation improvements (caissons and related structures) would be temporary and that they would not substantially alter the rate of seacliff retreat (i.e., at no time would they protect the cliff from erosion). These criteria also specify the regulatory process which would be followed in the event that the improvements are found to create a safety hazard after exposure on the seacliff. This process is considered to adequately address potential impacts on public safety.

2. Evaluation criteria.

a. Caisson spacing along the bluff face. The proposed caissons shall be at least five feet apart, measured edge to edge (e.g., caissons which are two feet in diameter would be seven feet apart measured from the center of the caissons).

Monitoring: The Planning and Development Department Geologist shall review and approve the final construction plans prior to the issuance of the Coastal Development Permit.

b. Caisson spacing perpendicular to the bluff face. Caissons or other foundation support structures constructed on or along a line approximately perpendicular to the general trend of the seacliff (e.g., at Isla Vista Beach this would be approximately perpendicular to Del Playa Drive) shall be constructed a minimum distance of five feet apart (seven feet on center for 24 inch diameter caissons) with the following exception:

they may be constructed as close as three feet apart (five feet on center for 24 inch diameter caissons) if designed and approved by a Registered Engineer or Certified Engineering Geologist. In no case shall they be closer than three feet apart (five feet on center for 24 inch diameter caissons). This criteria applies, in general, to caissons located along the side property lines on coastal parcels. This criteria is intended to prevent undermining or weakening of support of a caisson during removal of an adjacent caisson.

Monitoring: The Planning and Development Department Geologist shall review and approve the final construction plans prior to the issuance of the Coastal Development Permit.

- c. **Maximum coverage of the bluff face.** The caisson support system shall be designed such that upon exposure due to continuing erosion, the bluff face shall at a minimum be composed 70 percent of native material (e.g., two foot diameter caissons constructed seven feet apart on center would cover a maximum of 30 percent of the area of the bluff face if the system were fully exposed).

Monitoring: The Planning and Development Department Geologist shall review and approve the final construction plans prior to the issuance of the Coastal Development Permit.

- d. **Setback from adjacent property.** Foundation support structures shall be located at least three feet from a property boundary except as follows: the support structures may be located as close as one foot from a property boundary if designed and approved by a Registered Engineer or Certified Engineering Geologist. In no case shall any portion of a foundation support structure be closer than one foot from a property boundary. This setback provision is considered adequate to assure that an adjacent property is not encroached upon or subject to erosion during the installation of a caisson. Removal of caissons due to environmental impacts or safety hazards would occur only after they were no longer in contact with the bluff face. Thus, the bluff face on the adjacent property would not be affected by caisson removal activities. This criteria does not pertain to boundaries between two properties which are both part of the proposed project.

Monitoring: Prior to the issuance of the Coastal Development Permit, the following shall occur: 1) the Planning and Development Department Geologist shall review and approve the final construction plans and 2) the applicant shall submit a letter from a Registered Engineer or Certified Engineering Geologist that states that the location of the subject caisson meets the above setback and that the adjacent property will not be encroached upon or subject to erosion during the installation of the caisson(s).

- e. **Caisson setback from the bluff face.** Caissons shall be constructed a minimum of 10 feet landward of all parts of the bluff face in order to avoid potential erosion of the bluff face during construction. This setback was established by the Planning and Development Department Geologist based on observations of the character of the weak rocks exposed on the bluff face at Isla Vista Beach. A lesser setback distance for one or more caissons may be used if the Planning and Development Department Geologist determines that substantial construction-related impacts are not reasonably foreseeable based on site-specific conditions. In no case shall any construction occur within five feet of the bluff face (ordinance required setback).

Monitoring: The Planning and Development Department Geologist shall review and approve the final construction plans prior to the issuance of the Coastal Development Permit. The applicant shall clearly mark the locations of the proposed caissons and Permit Compliance shall conduct a site inspection during the pre-construction meeting required under the Coastal Development Permit to assure that the locations of the caissons meet the setback requirement.

- f. **Tieback design.** Angled tiebacks may be incorporated into the design of the foundation improvements if the proposed tieback design allows for removal in a manner which is safe for workers and unlikely to result in bluff face erosion or a public safety hazard in the opinion of the County Building Official and the Planning and Development Department Geologist. Tiebacks shall be removed at the time of caisson removal to the extent feasible without causing substantial erosion of the bluff face. (Note: DYWIDAG Systems International Threadbar Rock Anchors have been reviewed by the Planning and Development Department Geologist and County Building Official and are considered at this time acceptable for use as tiebacks.)

Angled tiebacks which do not meet the above criteria shall not be incorporated into the design. Lateral support for the caissons may be obtained through structures at the top of the bluff (e.g., caissons may be tied to patios and building foundations located on the elevated marine terrace landward of the top edge of the bluff face).

Monitoring: The Planning and Development Department Geologist and County Building Official shall review and approve the proposed tieback design and the proposed removal method prior to issuance of the Coastal Development Permit.

- g. **Notification and removal to avoid environmental impacts.** The project description shall incorporate the following procedures regarding the removal of the caissons in order to prevent the occurrence of significant environmental impacts on beach width (lateral access) and increased (or accelerated) erosion of adjacent properties.
- (1) **Advisory letter to property owner.** The property owner may receive an advisory letter from the Planning and Development Department or the County Building Official upon exposure of one or more caissons on the bluff face. This letter would inform the current owner of the apparent condition of the caissons (i.e., the level of caisson exposure on the bluff face) and the procedures outlined in the Evaluation Criteria (this document) which will be followed by the Planning and Development Department and the County Building Official as erosion of the bluff face continues. "Exposure" of a caisson is defined as the full width of the caisson(s) being visible over the lowermost three feet of the bluff face or the full width of the caisson(s) visible for a total of 10 feet (measured vertically) on the bluff face. This letter would not require any action but would provide early notification to the property owner of upcoming removal requirements.
 - (2) **Notice to remove to avoid environmental impacts.** A "Notice to Remove" letter may be provided by the Planning and Development Department to the property owner which calls for removal of one or more caissons to avoid impacts on beach width (lateral access) or increased erosion of adjacent properties. Removal shall be accomplished by the property owner within one year of the date of the Notice to Remove letter using the procedures specified in the Removal Plan prepared in accordance with the parameters listed in paragraph (3) below.

The physical parameters which would result in the preparation of a Notice to Remove letter are listed below.

- (a) **Beach width and lateral access impacts:** Significant impacts on beach width and lateral access will be considered to begin when seacliff retreat has proceeded to the point that the caisson(s) are located more than three feet seaward from the base of the bluff. At this point the caissons would not be in contact with the bluff face. According to studies incorporated into the environmental impact report for the Del Playa Seawall, certified by the Santa Barbara County Board of Supervisors on July 28, 1992, the emplacement of seawall (i.e., a fixed structure similar to an exposed caisson) three to four feet seaward of the base of the bluff would result in an estimated loss of up to 24 percent of the remaining average daily lateral access time. The property owner shall receive a Notice to Remove letter from the Planning and Development Department that states that the caisson(s) are three feet or more from the bluff face and calls for removal. The caisson(s) shall be removed by the property owner within one year of the date of this notification.
 - (b) **Erosion of adjacent properties impacts:** Erosion of adjacent properties due the presence of caissons would occur if the caissons served to reduce the rate of seacliff retreat such that a promontory was formed. Wave reflection off a promontory could cause increased erosion of an adjacent property. This effect is not anticipated to occur due to the spacing between caissons specified in criteria a. and b., above. These criteria (if followed) result in at least 70 percent of the bluff face being exposed to wave energy. When a majority of the bluff face is protected from wave energy, the rate of seacliff retreat is reduced, as can be observed at the existing seawalls at Isla Vista Beach. Isolated obstructions such as the support timbers for the access stairways on Isla Vista Beach which are several feet apart (similar in geometry to caissons exposed in front of the bluff face) have not discernibly reduced the retreat rate of the bluff face. However, if increased erosion of an adjacent property occurred due to a caisson-related promontory effect, it would happen after the caissons were no longer in contact with the bluff face and could be readily observed during the annual site inspection by the Planning and Development Department Geologist or County Building Official. If this effect is observed during the annual inspections, the property owner shall receive a Notice to Remove letter from the Planning and Development Department that includes a description of the evidence of increased erosion. The caisson(s) shall be removed by the applicant or current property owner within one year of the date of this notification.
- (3) **Removal plan to avoid environmental impacts.** A detailed description of the process by which the caissons would be removed shall be included in the project description submitted in the application for a Coastal Development Permit. This description should include a discussion of the following:
- (a) The physical procedure for cutting and removing the caissons.
 - (b) Access to the property.

- (c) Equipment to be used.
 - (d) The estimated duration of removal activities.
 - (e) Transport of the removed material from the beach to a disposal site.
 - (f) Worker safety.
 - (g) An estimate of the future cost of caisson removal.
 - (h) The project description shall include a proposed financial security adequate to assure implementation of the provisions for caisson removal. Security will be required prior to the issuance of the Coastal Development Permit for the installation of the caissons.
 - (i) In addition, the removal of structures (e.g., buildings, patios) supported by the caissons or other measures to assure structural stability should be similarly discussed. The feasibility associated with the described process will be evaluated by the Planning and Development Department including the Building and Safety Division.
- (4) **Removal process.** Removal of a caisson refers to the caisson in its entirety including tiebacks and any other supported structures. The portion of a caisson which would extend below the surface of the bedrock terrace shall be removed and the resulting hole backfilled with erodible material (fragments of Sisquoc shale, if available, or gravel). A Coastal Development Permit issued by the Planning and Development Department will be required to conduct removal activities.
- (5) **Monitoring:** The County Building Official or the Planning and Development Department Geologist shall conduct annual inspections of the properties along the seacliff at Isla Vista Beach to monitor the level of exposure of foundation structures (i.e., the visibility of the caissons and the distance that they extend seaward of the bluff face). The Planning and Development Department Geologist shall prepare a Notice to Remove letter to the property owner which calls for removal of the exposed structure if the caissons have become exposed such that they are located three feet or more seaward of the base of the bluff or are causing increased erosion on an adjacent property.

Funding for County staff time associated with the annual inspections and notification shall be provided from the accrued earnings from a interest-bearing account set up by the applicant to be reviewed and approved by the Planning and Development Department and County Counsel prior to issuance of the Coastal Development Permit for the construction of the caissons. Upon removal of the last foundation component associated with the current application, the principal and any remaining accrued interest shall be released to the applicant. The signature of the Director of Planning and Development Department or his designated representative will be required before release of this account.

In order to assure implementation of the removal provisions included in these evaluation criteria, the applicant shall provide a financial security to be reviewed and approved by the Planning and Development Department and County Counsel prior to issuance of the Coastal Development Permit for construction of the

foundation improvements. Note that this financial security would be separate from the interest-bearing account discussed above.

- h. Notification and removal for public safety hazards.** The project description shall incorporate the following procedures regarding the removal of the caisson(s) and related structures which are undermined by ongoing erosional processes such that they become hazards to public safety.
- (1) Advisory letter to property owner.** The property owner may receive an advisory letter from the Planning and Development Department or the County Building Official upon exposure of one or more caissons on the bluff face. This letter will inform the current owner of the apparent condition of the caissons (i.e., the level of caisson exposure on the bluff face) and the procedures outlined in the Evaluation Criteria (this document) which will be followed by the Planning and Development Department and the County Building Official as erosion of the bluff face continues. Exposure of a caisson is defined as the full width of the caisson(s) being visible over the lowermost three feet of the bluff face or the full width of the caisson(s) visible for a total of 10 feet (measured vertically) on the bluff face. This letter would not require any action but would provide early notification to the property owner of upcoming removal requirements.
 - (2) Notice to remove due to public safety hazards.** Upon identification of a potential hazard, the County Building Official or the Planning and Development Department Geologist shall prepare a Notice to Remove letter to the applicant/property owner which identifies the potentially hazardous condition. Upon receipt of this notification, the applicant will have 45 days to submit a report by a Registered Engineer or a Certified Engineering Geologist which documents the condition of the structure with regards to safety. After 45 days from notification, the hazardous components of the project shall be subject to hazard abatement (e.g., removal) procedures established by the County Building Official if no report is submitted, the report indicates that a safety hazard exists or if the County Building Official determines that a hazard exists despite contrary opinion expressed in the submitted report.
 - (3) Removal process.** The timing and method of removal shall be determined by the County Building Official during the hazard abatement process. The hazard abatement procedures are independent of these evaluation criteria and are based on standard engineering practice and applicable building regulations.
 - (4) Monitoring.** The County Building Official or the Planning and Development Department Geologist shall regularly conduct annual inspections of the properties along the seacliff at Isla Vista Beach to monitor the level of exposure of foundation structures (i.e., the visibility of the caissons and related structures and the distance that they extend seaward of the bluff face). If the caissons (or other foundation improvements) are determined by the County Building Official to represent a potential safety hazard, the Planning and Development Department Geologist or the County Building Official shall prepare a Notice to Remove letter to the property owner which calls for removal of the exposed structure. The procedures discussed in Subsections h.(2) and h.(3) above would then be implemented.

Funding for County staff time associated with the annual inspections and notification shall be provided from the accrued earnings from a interest-bearing account set up by the applicant to be reviewed and approved by the Planning and Development Department and County Counsel prior to issuance of the Coastal Development Permit for the construction of the caissons. Upon removal of the last foundation component associated with the current application, the principal and any remaining accrued interest shall be released to the applicant. The signature of the Director of the Planning and Development Department or his designated representative will be required before release of this account. Note that this account would be the same one as discussed in Subsection g.(5) of these evaluation criteria.

Note that the financial security to be provided by the applicant to assure implementation of removal for environmental effects (see Subsections g.(3) and g.(5)) is not intended to cover hazard abatement costs and would be available only to the Planning and Development Department. Funding of required hazard abatement work not performed by the property owner would be obtained by the County Building Official from the property owner through established legal procedures.

3. Impact analysis summary.

- a. Aesthetics.** Criteria a. and c., above would assure that no more than 30 percent of the bluff face would be covered with concrete. This design parameter would avoid significant visual impacts. The white vertical lines which would be formed by the caissons would, however, still be visually dominant when exposed. For the following reasons the aesthetic impact of the caissons (upon exposure) would be considered less than significant:
- (1) Maximum 30 percent concrete coverage of the bluff face (as stated above).
 - (2) The temporary nature of the caissons and the variability in the time of exposure due to the non-linear trend of the bluff edge would generally preclude all of the caissons on a particular parcel from being exposed at the same time.
 - (3) The sea bluff at Isla Vista is not an undeveloped, pristine area. The caissons would only incrementally degrade the visual character of the area. Because of the existing densely-developed nature of the bluff top on the particular properties, exposure of the caissons, as designed pursuant to these evaluation criteria, would not constitute a significant visual effect.
- b. Erosion of the adjacent unprotected properties.** Evaluation Criteria a., c., g. and h., above, would be considered to avoid significant erosion impacts based on the following reasons:
- (1) The caissons are not anticipated to substantially reduce the rate of landward erosion of the seacliff. Thus, a promontory would not develop with the exception of the caissons themselves. If a promontory did develop behind the caissons, the caissons would be removed pursuant to Criteria 7.
 - (2) Each caisson would be become separated from the bluff face within a short time after its initial exposure. Waves would wash behind the caissons and not be reflected onto the adjacent properties. Wave reflection and wave refraction

effects which would occur with a free-standing caisson would not substantially change the wave energy impinging on the adjacent property.

- (3) The setback from property lines (Criteria d.) would allow for the installation of the caissons without substantial erosion impacts to the adjacent property.
- c. **Long-term loss of beach width (lateral access impacts).** Impacts would be less than significant due to the implementation of the procedures included in Criteria g. Removal of the caissons within a year of the time that potentially significant impacts could begin to occur would prevent a substantial long-term effect on beach width and lateral access.
 - d. **Erosion of the bluff face during caisson removal activities.** Erosion of the bluff face is not anticipated to occur during the removal of the caissons to avoid environmental impacts as specified in Criteria g. because removal would not be required until after the caissons had been separated by natural processes from the bluff face. Removal of caissons due to public safety hazards as specified in Criteria h. would also be anticipated to occur after separation from the bluff face. Loss of bluff material by accidental contact with the bluff face during the process of caisson removal would constitute a short-term impact and would not alter the long-term rate of seacliff retreat.
 - e. **Erosion of the bluff during removal of the tiebacks.** Criteria f. would prevent the potential of an ongoing erosion problem either by requiring a design which would not result in such impacts during tieback removal. Tieback components remaining after initial caisson removal would be periodically cut back as they became safety hazards (Criteria h.).
 - f. **Near-term erosion due to caisson construction.** Criteria e. would minimize the potential of erosion of the bluff during construction of foundation improvements. With this provision, substantial erosion due to construction activities is not anticipated.

8. CULTURAL RESOURCES GUIDELINES, ARCHAEOLOGICAL, HISTORICAL, AND ETHNIC ELEMENTS

INTRODUCTION

This document discusses in general the cultural resource review process used by the Planning and Development Department. A technical document, Regulations Governing Cultural Resource Projects Undertaken in Conformance with Federal and State Environmental Protection Acts, provides procedures for cultural resource consultants to follow in preparing their investigations. These Regulations are available at the Planning and Development Department.

- A. Phase 1: Literature Search and Preliminary Assessment.** As part of the environmental review process, the Planning and Development Department reviews archaeological site maps to determine if a recorded cultural resource is located within the project site or whether there is a high potential for its presence onsite based on recorded site distribution patterns or historical accounts. If this determination is positive and the project site is not developed, a Phase I archaeological investigation including a systematic inspection of the ground surface is carried out by the Planning and Development Department staff or a County approved professional archaeologist (depending on the size of the parcel) and sub-surface testing to define the presence of archaeological artifacts or site boundaries when vegetation obscures ground visibility. If historical remains are suspected, a professional historian will be retained to evaluate more fully the resource. The Phase I investigation and report will follow the specifications defined in the Cultural Resource Regulations defined above.
- B. Phase 2: Cultural Resource Significance Determination.** If an archaeological or historical site is observed, the Planning and Development Department will work with the applicant to modify project plan descriptions such that direct impacts on cultural resources are avoided. Avoiding damage may be accomplished by many approaches, including the following:
1. Planning construction to miss cultural resource sites;
 2. Planning parks, greenspace or other open space to incorporate archaeological or historical sites;
 3. "Capping" or covering prehistoric or historic archaeological sites with a layer of fill soil before building tennis courts, parking lots, or similar facilities. Capping may be used in the following cases:
 - a. The soils to be covered will not suffer serious compaction.
 - b. The covering materials are not chemically active.
 - c. The site is one in which the natural processes of deterioration have been effectively arrested; and
 - d. The site has been recorded.

Although the placement of fill on top of an archaeological site may reduce direct impacts of construction, indirect impacts will possibly result from the loss of access to the site for research purposes and scarification and compaction of soils. To mitigate this impact, a sample of the cultural resource shall be excavated and appropriately curated for research purposes.

4. Deeding archaeological or historical sites into permanent conservation easements.

If the above avoidance measures cannot be used, a Phase 2 excavation program is funded by the applicant and performed by a County approved archaeologist and/or historian if necessary to determine if the cultural resource is "important" as defined in Appendix K of CEQA. If the project would cause damage to an important cultural resource, the project is considered to have a significant effect on the environment. For the purposes of CEQA, an "important archaeological resource" can be defined by one of several criteria listed below. Such a resource may have the following characteristics:

1. Is associated with an event or person of:
 - a. Recognized significance in California or American history; or
 - b. Recognized scientific importance in prehistory.
2. Can provide information which is of both demonstrable public interest and useful in addressing scientifically consequential and reasonable or archaeological research questions,
3. Has a special or particular quality such as oldest, best example, largest, or last surviving example of its kind.
4. Is at least 100 years old and possesses substantial stratigraphic integrity; or
5. Involves important research questions that historical research has shown can be answered only with archaeological methods.

The Archaeological Element of the County Guidelines provides a variety of relevant research questions for use in addressing significance criterion 4.e.

The Phase 2 investigation and report must follow the specifications defined in the Cultural Resource Guidelines defined above. The report must include significance assessments and propose ways to avoid impacting the important resource. The report shall also include a suggested excavation plan for mitigating the effect of the project on the qualities which make the resource important if avoidance is considered infeasible.

The excavation plan shall include the following:

1. A brief summary of the excavation proposed as part of a mitigation plan.
2. Be available for review only on a need-to-know basis;
3. Shall not include the specific location of any archaeological resources if the plan would be made known to the general public.

An excavation plan shall also mention the following:

1. List and briefly discuss the important information the archaeological or historical resources contain or are likely to contain;
2. Explain how the information should be recovered to be useful in addressing scientifically valid research questions and other concerns identified in subdivision (a);
3. Explain the estimated cost of time required to complete all activities undertaken under the plan.

A list of significance criteria for evaluation of historical resources is found in the Historic Element of the County Guidelines and is summarized below. Any structure 50 years or older is considered

potentially significant and shall be subjected to the following criteria:

A significant resource a) possesses integrity of location, design, workmanship, material, and/or setting; b) is at least fifty years old¹; and c) demonstrates one or more of the following:

1. Is associated with an event, movement, organization, or person that/who has made an important contribution to the community², state, or nation;
2. Was designed or built by an architect, engineer, builder, artists, or other designer who has made an important contribution to the community, state, or nation;
3. Is associated with a particular architectural style or building type important to the community, state, or nation;
4. Embodies elements demonstrating a) outstanding attention to design, detail, craftsmanship, or b) outstanding use of a particular structural material, surface material, or method of construction or technology;
5. Is associated with a traditional way of life important to an ethnic, national, racial, or social group, or to the community-at-large;
6. Illustrates broad patterns of cultural, social, political, economic, or industrial history;
7. Is a feature³ or a cluster of features which convey a sense of time and place that is important to the community, state, or nation;
8. Is able to yield information important to the community or is relevant to the scholarly study of history, historical archaeology, ethnography, folklore, or cultural geography.

The level of significance for these criteria are established by rating each significance attribute of the resource (detailed below) according to the following scale:

- E = exceptional
- 3 = high; very good
- 2 = good
- 1 = little

A rating of E for any significance attribute marks a resource as possessing extraordinary or exceptional importance and indicates that it should receive special consideration in the planning process regardless of the numeric rating for other significance attributes. For instance, a resource may be of extreme antiquity,

And therefore be rated E in the aspect of age, but achieve an average numeric rating of, say, 1.7 in all other attributes of significance.

The following guidelines shall govern the assignment of significance level ratings for each aspect:

1. Integrity.

- E = pristine integrity in all five categories
- 3 = good integrity in at least three categories
- 2 = good integrity in at least one category

¹ A historic resource less than fifty years old may be considered significant if it is unique or possesses extraordinary elements of integrity, design, construction, or association.

² Community is defined as a neighborhood, town, city or district.

³ A feature may be defined as a structure, building, structural element, object, tree, garden, etc.

1 = fair to poor integrity in all categories

Integrity means that the resource retains the essential qualities of its historic character. These guidelines recognize five components of integrity: location, design, setting, materials, and workmanship.

Integrity of location means that the resource remains at its original location.

Integrity of design, strictly applied, means that the resource accurately reflects its original plan. However, it is rare to find intact structures that have never undergone change. Thus, design integrity often infers that the components of the structure as a whole reflect design compatibility. For example, building additions that accurately incorporate design elements found in the original structure (e.g., roof pitch and covering, window placement and form, or exterior wall treatment) would not compromise integrity of design.

Integrity of setting means that buildings, structures, or features associated with a later development period have not intruded upon the surrounding area to the extent that the original context is lost. For instance, an old barn now in the midst of suburban residential development might retain integrity of setting if the immediately surrounding area still reflects a rural setting (e.g., open space, fencing, water troughs, etc.).

Integrity of materials means that the physical elements present during the historic period are still present or, if materials have been replaced, the replacement(s) have been based on the original. For instance, a Victorian style wood-frame dwelling that has been covered with stucco has lost its integrity of materials. Conversely, an adobe wall that has been reconstructed with similar adobe mud, as opposed to adobe-simulate concrete, would retain its integrity of materials.

Integrity of workmanship means that the original character of construction details is still present. These elements cannot have deteriorated or been disturbed to the extent that their value as examples of craftsmanship has been lost. For example, if the surface of a carved sandstone gate post has been seriously eroded, the feature will have lost much of its integrity of workmanship because its ability to provide information concerning older designs and techniques of stone carving has been lost. Conversely, a steel superstructure may hide unreinforced brick walls of an old commercial building which can provide a valuable record of 19th century solid-wall brick construction techniques.

2. Age.

E = 125 years old or older

3 = 100 years old or older

2 = 75 years old or older

1 = 50 years old or older

Comment: An E designation is based on the premise that any manmade feature which survives for 125 years or more is intrinsically exceptional and therefore subject to special consideration by virtue of its age, irrespective of other ratings.

3. Association.

a. Association with an event, movement, organization, or person important to the community, state or nation.

E = resource has a central or continuous association with an event...

- 3 = resource has a direct association with...
- 2 = resource has an indirect association with...
- 1 = resource has a distant association with...

Comment: The significance of the event, movement, organization, or person must be established before this criterion is applied.

b. Designer.

- E = a designer who has made important contributions to the community and to the state or nation
- 3 = a designer who has made important contributions to the community
- 2 = an "attributed to" designer who has made important contributions to the community
- 1 = the designer is unknown.

Comment: This significance attribute focuses on overall designer contributions rather than on the aesthetic merits of the design itself.

c. Architectural Style or Building Type.

- E = retains all the attributes associated with its style or type or is a good example of its style or type if few survive
- 3 = retains most of the attributes associated with its style or type or is remodeled in a recognizable style that does not destroy the original style or type
- 2 = retains few, but sufficient attributes associated with its style or type
- 1 = undecipherable as a style or type or is one of many examples of its style or type

Comment: Vernacular building types and industrial architecture are equal in resource value to well-defined and studied architectural styles.

d. Construction materials.

- E = outstanding or very early example if few survive
- 3 = outstanding or very early example if many survive; good example if few survive
- 2 = good example if there are many examples of any material(s) and/or method(s) not generally in current use
- 1 = common example of any method(s) and/or material(s)

Comment: Examples of outstanding construction methods or structural materials include those which successfully address challenging structural problems, or which are treated as visible elements that contribute significantly to the resource's overall design quality, or which exhibit fine craftsmanship.

e. Traditional Lifeways.

- E = resource has a central association with a tradition spanning three or more generations
- 3 = resource has a direct association with a tradition spanning three or more generations
- 2 = resource has a direct association with a tradition spanning two generations or an indirect association with a tradition spanning two or more generations
- 1 = resource has a distant association with a tradition spanning two or more generations

Comment: Traditional lifeways, as used here, pertain to cultural patterns which have attained antiquity commensurate with the age requirement to which tangible resources are held. A central association ("E" rating) implies a quality of uniqueness between the resource and the tradition.

f. Association with Broad Themes of Local, State, or National History.

- E = resource has a central association with theme(s)
- 3 = resource has a direct association with theme(s)
- 2 = resource has an indirect association with theme(s)
- 1 = resource has a distant association with theme(s)

Comment: The theme and its significance must be established before this criterion is applied. A helpful measure of this criterion is to consider how useful the resource would be for teaching or writing about cultural history.

g. Conveys Important Sense of Time and Place.

- E = an individual resource or a unified urban or rural landscape which defines a period of 100 or more years ago
- 3 = an individual resource or a unified urban or rural landscape which defines a period of 75 or more years ago
- 2 = an individual resource or a unified urban or rural landscape which defines a period of 50 or more years ago
- 1 = a unified urban or rural landscape which is less than 50 years old

Comment: A useful measure of this criterion is to consider whether the resource(s) has/have a prominence which contributes to a historic, visual, or environmental continuity. Would a typical resident of the area notice the resource(s) and remember it/them?

h. Ability to Yield Important Information.

This attribute of significance is not quantifiable. Generally, when this criterion is invoked, it is an indication that the resource under study requires further examination by a professional from a related discipline. Nevertheless, it is incumbent upon the historical specialist to consider what qualities of the resource or the project area might enable it to yield information that is important to another scholarly discipline.

For instance, the presence of building foundations or of a well, privy, trash pit, drain, sump, or cistern indicates that the project area may possess historic archaeological research potential. Similarly, is there archival evidence (maps, written documents, etc.) that the project area was occupied before or during some transitional period, either naturally occurring (e.g., fire, flood, drought, or earthquake) or culturally induced (e.g., highway or city street construction, the laying of water or sewer mains, or new building construction)? As a corollary, is there evidence that these earlier features may have survived to the present as subsurface resources?

In a different vein, is there evidence, gained through archival research, site inspection, or consultation with community groups or individuals, that the project area has a tangible or intangible quality of tradition that is important to an identifiable cultural group? For instance, there might be evidence that Italian immigrant stonemasons had cut stone from a sandstone outcropping occurring in the project area or that the area

might be the site of a legendary event. If so, even if the data are sufficient, to determine a significance level under C-5, it would be appropriate to discuss additional research potential here.

If a cultural resource is determined not to be "important", both the resource and the effect on it shall be noted in the project file Initial Study or EIR but need not be considered further in the CEQA process. The project applicant is responsible for the complete funding of Phase 2 investigations. Phase 2 investigations are not limited by cost; however, costs are limited to providing services defined in scopes of work which are developed by the Planning and Development Department.

C. Phase 3: Mitigation.

1. **Introduction.** Once it is determined that an important archaeological or historical site may be significantly impacted by a project, the County may require preparation of an EIR. The EIR discussion must include the following work: (1) document the justification for the "importance" determination; (2) determine what type of information is necessary to evaluate the "scientifically consequential information from and about the resource," and if this information has already been gathered during previous investigation phases. The consultant developing the mitigation program consider that excavation as part of a mitigation plan shall be restricted to areas of direct and indirect impact unless special circumstances require limited excavation or an immediately adjacent area in order to develop important information about the part of the resource that would be destroyed.
2. **Mitigation of Important Archaeological or Historical Sites and Timing.** There are special timing and deadline issues on mitigation programs required in CEQA Appendix K. Important timing issues state that unless special or unusual circumstances warrant an exception, the field excavation phase of an approved mitigation plan shall be completed within 90 days after final approval necessary to implement the physical development of the project, or, if a phased project, the excavation should take place in connection with the phased portion to which the specified mitigation measures are applicable, provided that the project applicant may extend that period if he/she so elects. A mitigation plan shall not authorize violations of any law protecting Native American cemeteries. This means that the County must apply a standard condition to insure that the applicant performs all applicable archaeological mitigation within 90 days after receiving approval on final development plans, or after subdivision map records (Final Map or Parcel Map) unless phasing or special circumstances change this "deadline." The County has the responsibility to wait at least 60 days after the EIR is completed before making a final decision on the project. This time is required in order that persons interested in providing funding agree to do so before the decision is made which would implement any specific mitigation measure.
3. **Information Regarding Project Costs and Mitigation.** CEQA Appendix K designates limits on an applicant's responsibility to fund mitigation programs. These limits follow:
 - a. An amount equal to one-half of one percent of the projected cost of the project for mitigation measures undertaken within the site boundaries of a commercial or industrial project.
 - b. An amount equal to three-fourths of one percent of the projected cost of the project for mitigation measures undertaken within the site boundaries of a housing project.
 - c. If a housing project consists of more than a single unit, an amount equal to three-

fourths of one percent of the project cost of the project for mitigation measures undertaken within the site boundaries of the project for the first unit plus the sum of the following:

- (1) \$200.00 per unit for any of the next 99 units.
- (2) \$150.00 per unit for any of the next 400 units.
- (3) \$100.00 per unit in excess of 500.

Where an important archaeological site is involved, the applicant must provide the County with documented, itemized, and projected total project costs, and if applicable, any project phasing information which could more adequately accommodate the timing and implementation of the field excavation portion of the work beyond the 90 day deadline.

The applicant must also provide an itemized cost estimate of all project design expenditures necessary to preserve portions of all or any archaeological site from disturbance. The County may give credit for these costs in computing the applicant's mitigation costs.

The archaeological consultant must provide several sets of mitigation programs. One will be the estimate of the excavation costs and timing along with the laboratory analysis and report preparation costs and time necessary to fulfill the requirements of the research design. In addition, the consultant should present an alternative mitigation program in case funds guaranteed by the applicant and voluntarily guaranteed by any other persons or persons are less than the original mitigation estimate.

4. **Land Use Element and Local Coastal Plan Policies and Mitigation.** Historical and Archaeological sites policies in the County Land Use Element and Local Coastal Plan specify that if "sufficient planning flexibility does not permit avoiding construction on ... cultural sites, adequate mitigation shall be required. Mitigation shall be designed in accord with guidelines of the State Office of Historical Preservation and The Native American Heritage Commission." It is possible that adequate mitigation costs based on this policy may exceed limits imposed by CEQA Appendix K defined above. In these cases, use of the Appendix K funding limit would cause an inconsistency with these County Land Use Element and Local Coastal Plan policies.
5. **Sites Discovered During Construction.** CEQA Appendix K provides for an archaeological evaluation of the "surprise" find during construction. Construction shall cease in the area of the find but may continue on other parts of the building site while evaluation and necessary mitigation takes place. The applicant would be responsible for funding an immediate evaluation of the find's potential importance. If the find is determined to be an important archaeological resource under CEQA Appendix K, contingency funding and a time allotment sufficient to allow recovering a data recovery sample or to employ one of the avoidance measures shall be implemented.

These provisions shall be included as project conditions where there is some likelihood of an archaeological impact during construction. For example, this would apply to an area near an adjacent recorded site or where no cultural resources were discovered during a field survey, or within a site area previously tested and mitigated by a sample excavation.

D. Curation of Collections.

All non-burial related artifacts collected during Phase 1, 2, and 3 investigations must be curated at an institution within Santa Barbara County. Qualified institutions are those with proper facilities

and staffing for insuring research access to the collections. The University of California at Santa Barbara Department of Anthropology is currently the only qualified local institution providing this service to the public and scientific community. In addition to artifacts, all supporting archaeological documentation must be submitted with the artifact collection. Curation arrangements with a qualified institution must be established prior to archaeological proposal preparation. Artifacts curated at the institution may be borrowed by qualified individuals and groups for educational use, display, ceremonies, etc.

The disposition of burial-related artifacts is covered by state law concerning burial remains (see Ethnic Impacts, Discovery of Human Remains).

E. Ethnic Impacts.

- 1. Ethnic Impact Assessment.** Appendix G, Significant Effects, of CEQA defines the need for evaluating the impacts a project may have on a community, ethnic, or social group.

A project will normally have a significant effect on the environment if it will cause one of the following:

- j. Disrupt or adversely affect a prehistoric or historical archaeological site or a property or historical or cultural significance to a community or ethnic or social group.
- w. Conflict with established recreational, educational, religious, or scientific uses of the area.

In order to evaluate these potential impacts, the County requires that appropriate representatives of affected community groups be contacted to assess their concerns and viewpoints concerning measures to mitigate those impacts. Ethnologists approved by the Planning and Development Department are to carry out this research in accordance with requirements and procedures for assessing ethnic cultural resources and concerns in compliance with the California Environmental Quality Act (Susan Brown n.d.) adopted by the Planning and Development Department, and the Native American Heritage Commission's Guidelines for the Protection of the Native American Heritage Resources. Contact should be made early in the evaluation process during the Phase I investigation as well as subsequent phases of work.

If the affected community does not consider to mitigation measures proposed by consulting archaeologists and incorporated in the project description by the applicant, the project may be considered to result in a significant impact and an EIR (or EIR section) may be prepared.

There are currently four recognized Native American groups in Santa Barbara County representing local Native American individuals of Chumash descent. The United Chumash Council represents various Chumash groups of the South Coast. The Santa Ynez Federally Recognized Elders Council represents Chumash living on the Santa Ynez Reservation. The Santa Ynez Kit Wo' N' Unio represents particular families on the Reservation, and the Candelaria American Indian Council represents South Coast documented Chumash. The Planning and Development Department will contact all groups if prehistoric archaeological sites are to be impacted to evaluate this effect on their ethnic values.

- 2. Discovery of Human Remains.** The County policy regarding disposition of human remains disturbed during project construction is defined in CEQA Appendix K, Section VIII. If remains are encountered at any time, the County Coroner shall be contacted to determine the

age and the origin of the bones. A qualified physical anthropologist will assist the coroner to make the determination whether human remains are prehistoric or not. If human remains are considered Native American, the individuals most likely to have descended from the individuals represented by the remains will then be contacted who will make recommendations regarding the treatment and re-internment of the remains and associated grave goods. If no descendants can be identified, the Native American Heritage Commission shall select the representative responsible for the disposition of the remains. These arrangements will be made with the landowner and will include an appropriate period of time for a Planning and Development Department approved physical anthropologist to analyze and record the remains and a Planning and Development Department approved archaeologist to analyze the associated grave goods.

- 3. Native American Consulting.** Native Americans are retained during all sub-surface investigations and disturbances of archaeological sites to insure compliance with Appendix K, Section VIII. They may be involved in Phase I fieldwork investigation as well.

F. Sequential Steps for Implementation of CEQA Appendix K.

1. Determination by the Planning and Development Department staff during Initial Study process that a project site may have a potential archaeological, or historical, or Native American culturally significant resource.
2. Professional fieldwork and documentation that a project will or will not have a direct or indirect physical impact on such a resource (Phase 1 investigation).
3. If the project does not have such potential, a finding of "significant impact" is not made and EIR is not prepared (specifically for "cultural resource reasons"). The project may also be redesigned or "self conditioned" at this stage to avoid the resource or to guarantee its protection.
4. If the project does have the potential to impact significantly a resource and the project cannot be revised to avoid the resource, the site must be evaluated in order to determine whether it meets the criteria to be defined as important (Phase 2 investigation). Evaluations are performed by a Planning and Development Department approved archaeologists, historians, and/or ethnographers and may or may not require field excavation as well as laboratory analysis but such reports do require, at a minimum, a historical records search when the site has been previously disturbed.
5. If the resource is found to be unimportant, no further professional work is required and a negative declaration may be issued if the only issue is cultural resource impacts.
6. If a determination is made that the resource is important, the applicant will be requested to work closely with the County and the cultural resource consultant to provide for appropriate mitigation either by avoidance of the deposit, adoption of development restrictions to preserve them, or special construction techniques (e.g., covering, etc.) to protect them. To the extent that direct impacts cannot be avoided, mitigation measures shall be required. The development of such measures will be the task of the consultant working in conjunction with the county and the applicant, which would require additional archaeological excavation of a sample of the area to be impacted (Phase 3 investigation).
7. The consultant will need to be provided the cost-estimates of each project if the analysis reaches this stage. According to CEQA the amount paid by a project applicant for mitigation depends upon the kind of project and the number of units. The mitigation cost formulas are

the following:

- a. Commercial or industrial projects:

Mitigation Costs (MC) = Total project cost (TPC) x 0.005

- b. Residential Projects:

(1) One unit: $MC = TPC \times 0.0075$

(2) One - 99 units: $MC = \text{Project costs for one unit (PC1)} \times 0.0075 + \$200 \times (\text{total number of units less one (TNU-1)})$

(3) 99 - 499 units: $MC = PC1 \times 0.0075 + \$200 \times TNU-1 (\text{up to } 99) + 150 \times (\text{number of units from } 99 \text{ up to } 499)$

(4) Over 500 units: $MC = \text{formula (3) above} + \$100 \times (\text{number of units in excess of } 500)$

This total may be determined to be inadequate to fully mitigate cultural resource impacts and be inconsistent with the County Land Use Element and Local Coastal Plan policies.

8. After the consultant prepares a report substantiating the importance of the resource together with an appropriate mitigation program(s) detailing full mitigation costs and maximum applicable costs to the applicant (using (7) above), the County will enter the data into an EIR to allow for full public and applicant comment, and certify the document.

The consultant must state and the County must decide whether previous studies of the resource have "... adequately recovered the scientifically consequential information from and about the resource." The County and the consultant are required to present the evidence for such a finding in the EIR. In such a case, no further mitigation would be required. In some cases, previous information concerning a site may provide only partial information and more research may be needed.

9. If necessary, the County must seek out private donations for the unpaid one-half of the proposed mitigation program within 60 days of the certification of the EIR and before the discretionary decision on the project application.

REFERENCES

These references are available through the County of Santa Barbara Planning and Development Department.

Conservation Element of the Comprehensive Plan, April 1979. pp. 13 - 14, 224 - 256.

Land Use Element of the Comprehensive Plan, August 1982. pp. 89 - 90, 109.

Santa Barbara County Coastal Land Use Plan, Section 3.10, Archaeological and Historical Resources, pp. 140-143, March 1981

County Land Use and Development Code, Section 35.60.040

9. ELECTROMAGNETIC FIELDS THRESHOLD

A. Introduction.

Due to the proliferation of sources of electrical energy with their associated electromagnetic fields (EMFs) and increasing public awareness over the potential health affects associated with these sources, the need to address these potential health effects through disclosure of potential environmental impacts has arisen. Although scientific evidence is inconclusive, this document briefly summarizes the information known regarding EMFs, identifies guidelines for evaluating impacts, sets a threshold to trigger project-level environmental review, and suggests mitigation approaches where possible to reduce exposure to electromagnetic fields.

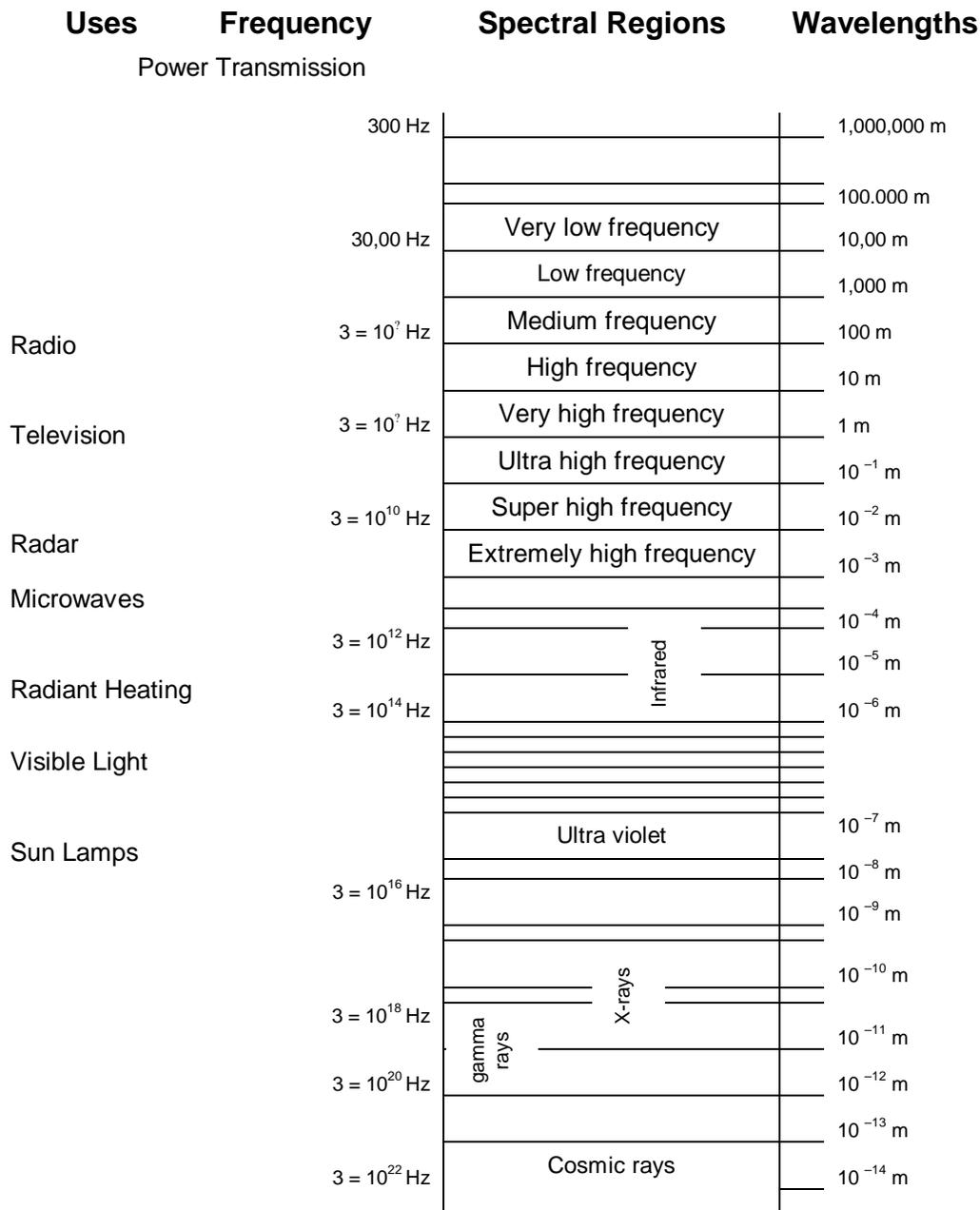
B. Background.

Electromagnetic fields are composed of both electric fields and magnetic fields. Both types of fields occur in nature and in all living things. Electromagnetic energy occurs over a broad range of frequencies known as the electromagnetic energy spectrum (see figure 1). The frequency, or Hertz (Hz), that we are concerned with in this County, ranges from extremely low frequency (60 Hz) associated with power transmission facilities to 3×10^{10} Hz associated with microwaves. In between these frequencies are EMFs generated by radio, television, and radar transmissions. EMFs generated by these sources have similar properties in that they all contain electric and magnetic fields. However, the types of EMFs generated by extremely low frequency sources have different and distinct properties than those generated by higher frequency sources associated with communication facilities. These differences are discussed in more detail below.

Electric and magnetic fields are present wherever there is an electric current and voltage. Electric fields come from the amount of the charge, or voltage. They represent the forces that electric charges, which are either positive or negative, exert on each other. Electric fields are measured in volts per meter (V/m), or kilovolts per meter (kV/m). As electric charges move, they create additional forces on each other. These forces are carried through space by magnetic fields. Magnetic fields, therefore, result from the motion of an electric charge, or current. Magnetic fields are measured in milligauss (mG). When most people think of EMFs, they probably think of power transmission and distribution lines, however, they are present in household wiring and appliances and are propagated by communications facilities.

The physical characteristics of radiofrequency radiation (RFR) and extremely low frequency (ELF) EMFs from electric power differ in their function, frequency, wavelength, power levels and EMF characteristics. The function of communication facilities is to radiate energy away from an antenna outward over long distances, providing a broadcast signal for reception at another point. This is in direct contrast to electric power transmission, where the goal is to minimize any radiation away from the power cable itself (minimize power loss), while maximizing efficient energy movement along the power line. Thus, communications systems broadcast energy out through space, while power transmission attempts to minimize energy loss in space by sending energy along a cable (Wong, 1991).

Regarding the characteristics of frequency, wavelength, and power levels, ELFs differ from radio waves in that they are much lower in frequency, have extremely long wavelengths compared to very short wavelengths of radio waves, and the power levels are generally much higher in power transmission facilities than in communication facilities.



Source: EFRI, Undated

Figure 1. The electromagnetic spectrum shown by frequency and wavelength. At a frequency of 60 Hz and a wavelength of 5,000,000 meters power transmission is at the top of the figure. Frequencies less than 300 Hz are designated as the ELF (extremely-low-frequency) range.

In the case of EMF from communication facilities, the electric and magnetic fields travel, or propagate long distances from their sources. The electric and magnetic fields are linked and are considered together as a radiating electromagnetic field, thus creating what is known as radiofrequency radiation. In contrast, low frequency EMFs found in power lines project fields around the power line itself and do not propagate. In the case of electric power, the electric and magnetic portions are considered to be independent, and are not linked. Thus, when studying power-frequency fields, the separate electric and magnetic fields must be considered, not just the radiating electromagnetic fields or RFR which is typically studied in the case of radio waves (Tenforde and Kaune, 1987).

Radiation associated with EMFs is considered non-ionizing radiation. That is, the energy associated with these types of electromagnetic fields do not have the ability to ionize electrons and molecules. Ionization refers to the breakdown of chemical bonds between molecules, which results in tissue damage (Wong, 1991).

Common sources of EMFs (both low and higher frequency sources) and their field strength characteristics are discussed in Appendix A.

C. Health and Safety Issues.

In recent years, involuntary exposure of the general public to elevated EMFs has become a growing concern. This attention centers on a growing body of evidence, some of which suggests that 60-Hertz (Hz) magnetic fields at low intensities have been shown to produce adverse biological effects, in addition to factual proof that thermal heating of body tissue associated with RFR can have harmful effects.

Studies regarding ELF's to date have primarily been focused in three categories. These include cellular level studies, whole animal and human studies, and epidemiological studies. Cellular level studies have been focused on calcium efflux, cancer promotion, endocrine secretion and immune response. Animal and human studies have been focused on the nervous system, behavior patterns, reproduction and development; and cancer progression. Epidemiological studies have looked at the hypothetical relationship between human exposure to EMFs produced by power systems and human cancers occurring in children, adults and workers in occupations where extensive exposure to EMFs is an issue. Studies in each of these three categories indicates that there is evidence that 60-Hz magnetic fields can produce biological effects. A summary of these effects is included in Appendix A. What is not clear, however, is whether and how those biological effects can cause public health problems (Wong, 1991).

Effects of RFR have been primarily linked to thermal responses as a result of exposure to RF sources of energy. In general, exposure of humans and animals have the potential to interact with body tissue such that water molecules become excited, causing friction and concomitant rises in body temperature, albeit slight in most instances. This effect is similar to that which is experienced within a microwave oven, where the water molecules within the food substance are excited to create heat, thus resulting in the warming of food. Other effects, include RF burns, in which in the very near field, especially in the microwave frequencies, a person has the potential to receive a burn similar to a sunburn. The standards for RFR discussed below deal primarily with thermal effects, as many of the athermal effects are still unknown and are similar to those discussed above for ELF sources. Some of the potential ill-effects include behavior changes, abnormal hormone production, and ocular changes.

D. Thresholds.

1. **ELFs.** While some evidence supports the fact that there may be some biological effects which may result from low frequency EMFs, there are no standards or guidelines to govern the public's involuntary exposure to ELFs. Some jurisdictions throughout the nation and internationally have tried to address the problem by establishing setbacks based upon field strengths from high voltage power lines. However, none of the setbacks established are based on any causal relationship between field strengths and adverse health effects.

Standards for ELFs are based upon the measurements of Kv/m for electric fields, and mG for magnetic fields. At the present time, most attempts at establishing standards or dosimetric relationships have focused on the limitation of magnetic fields since it is generally impossible to shield individuals from these fields. In general, it is relatively easy to shield individuals from electric fields as they do not readily penetrate buildings, structures, fencing, trees, etc.

At this time, given the current information regarding potential health impacts and the uncertainty surrounding these impacts, the Board of Supervisors did not adopt a specific threshold for ELF exposure. Instead, the Board of Supervisors directed staff to evaluate ELF exposure on a case by case basis, using the most current scientific data.

2. **RFR.** For RFR, standards have been established for effects resulting from thermal heating of body tissue. The most widely used conservative standards are the IEEE-ANSI C95.1-1992 Standards, which are based on power densities, as shown in Figures 2 and 3. Power density is the rate at which electromagnetic energy radiates through space in terms of watts per square meter (W/m^2) or milliwatts (1/1,000th of a watt) per square centimeter (mW/cm^2) and is customarily used in addition to the specification of the strengths of electric and magnetic fields by kV/m and mG when defining standards. It is important to note that the IEEE-ANSI standards are frequency dependent. That means that for sources of RF below and above the 30-300 MHz range, the standard is relaxed in accordance with the graph in Figure 2 and 3. The most stringent standard is for the 30-300 MHz range, and is represented by the power density level of $0.2 \text{ mW}/\text{cm}^2$ for general population exposure and $1.0 \text{ mW}/\text{cm}^2$ for occupational exposure. These standards do not address the athermal effects which are also associated with ELFs.
3. **RFR threshold.** "If humans would be exposed to radiofrequency radiation (RFR) in excess of the IEEE-ANSI C95.1-1992 standard, through the siting of new projects next to RFR sources or through the siting of new RFR sources adjacent to sensitive receptors , then a potentially significant impact would occur. (If the FCC rulemaking committee adopts a revised standard, said standard shall apply).

E. Mitigation Strategies.

In order to mitigate potential impacts from electromagnetic fields, mitigation should be designed to prevent exposure of individuals to elevated electromagnetic fields. For ELFs, this means that projects should be designed such that no living spaces are exposed to elevated magnetic fields. For RFR, individuals should not be exposed to levels exceeding the IEEE-ANSI Standards. Mitigation may take the form of setbacks, prohibitive/restrictive fencing, warning signs, disclosure statements, reconfiguration of power lines, reduction of power inputs to transmitting facilities, etc.

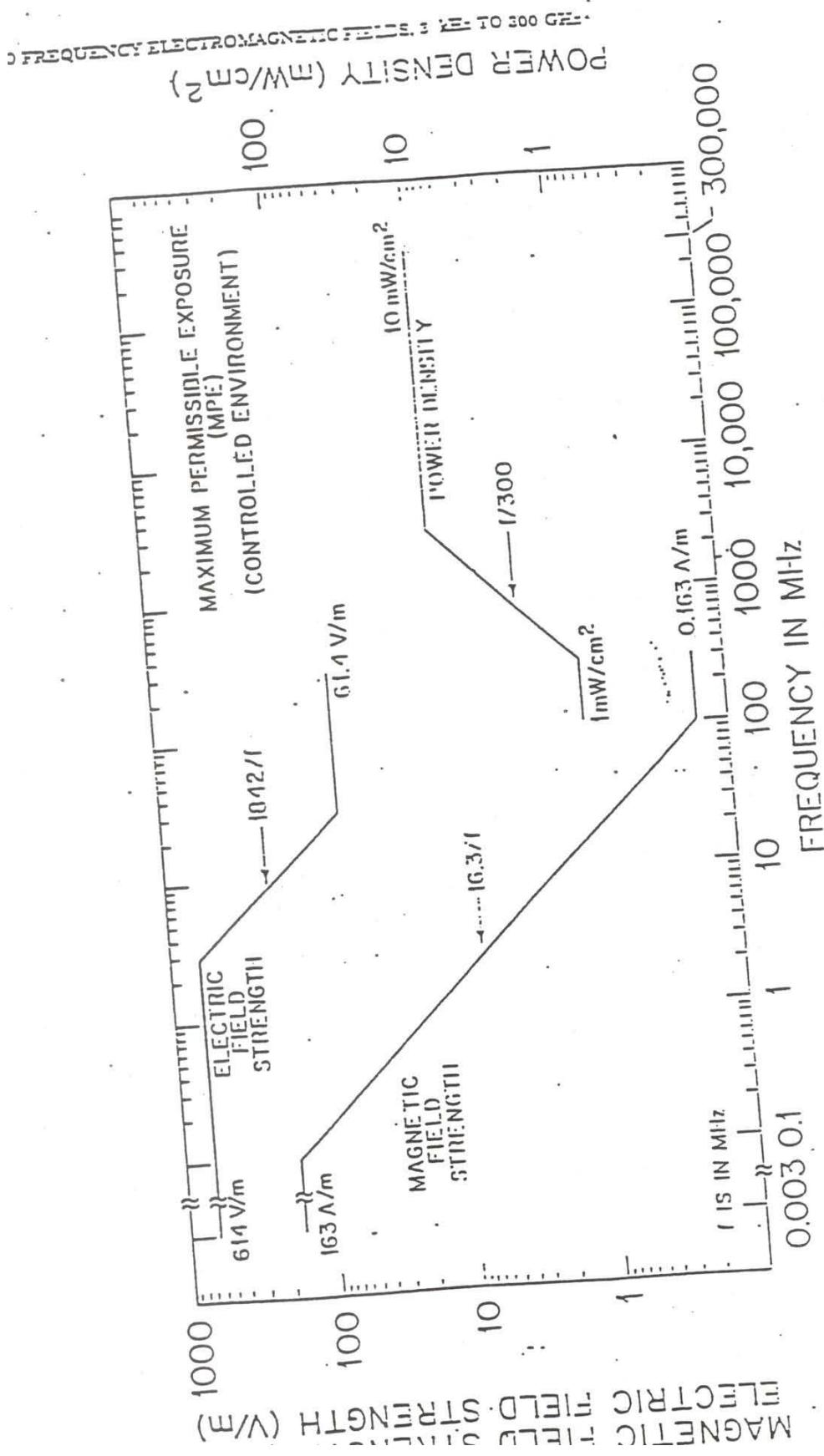


Fig. 2
 Graphical Representation of Maximum Permissible Exposure in Terms of Fields and Power Density for a Controlled Environment.

IEEE STANDARD FOR SAFETY LEVELS WITH RESPECT TO HUMAN EXPOSURE TO

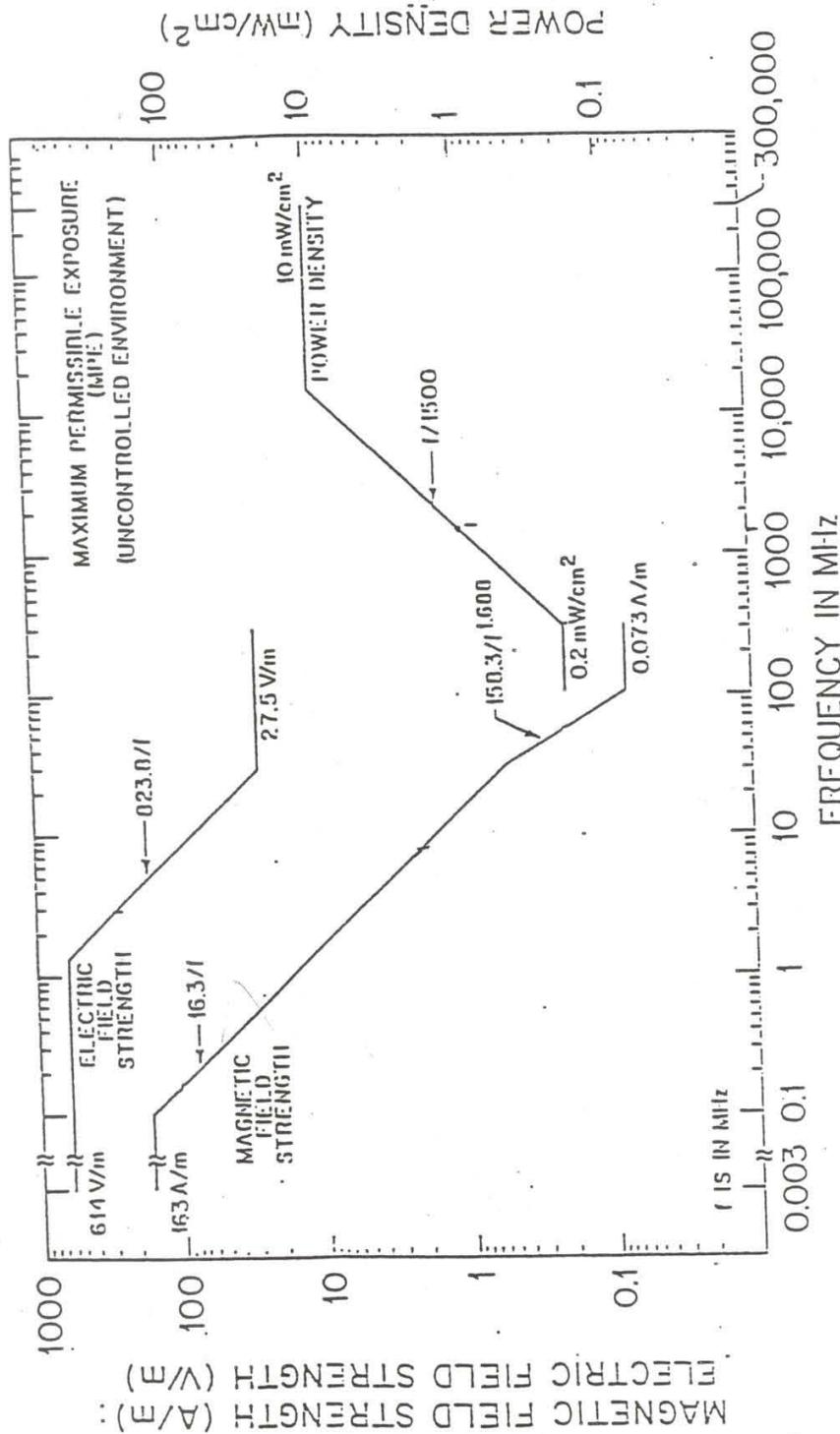


Fig. 3
Graphic Representation of Maximum Permissible Exposure in Terms of Fields and Power Density for an Uncontrolled Environment.

REFERENCES

- Krieger, Roy. On the Line. American Bar Association Journal, January 1994.
- Adey, W.R. Tissue Interactions With Nonionizing Electromagnetic Fields. Physiological Review, April 1981.
- Banks, Roberts Associates. Electric and Magnetic Fields: Summary of Developments. (Edison Electric Institute Electric and Magnetic Fields Task Force, 1990.)
- California Department of Health Services. An Evaluation of Alleged Cancer Clusters Among Teachers at Slater School Between 1973 and 1992. p. 11, 1993.
- Electric Power Research Institute. Electric and Magnetic Field Fundamentals: An EMF Health Effects Resource Paper. Undated.
- Environmental Protection Agency. Questions and Answers About Electric and Magnetic Fields (EMFs). December 1992
- E.P.R.I. Survey of Residential Magnetic Field Sources, Volume 1, Goals, Results and Conclusions. L. E. Zaffanella, Principal Investigator, Sept. 1993.
- Morgan, M. Granger. Electric and Magnetic Fields from 60 Hertz Electric Power: What do we know about possible health risk? (Pittsburgh: Carnegie Mellon University, Department of Engineering and Public Policy, 1989.)
- National Council on Radiation Protection, Report No. 86, Biological Effects and Exposure Criteria for Radiofrequency Electromagnetic Fields. (NCRP Publications, 7910 Woodmont Avenue, Suite 1016, Bethesda, Maryland, 20814. 1986.)
- Sage, Cindy. Consultations, January 1994.
- Sykes, Thomas M. and Ping Li. Possible Health Effects of Electric and Magnetic Fields from Electric Power Lines: A Summary of Scientific Studies. (Olympia, WA: The Evergreen State College, Washington State Institute for Public Policy, 1990.)
- Santa Barbara County Resource Management Department. Gibraltar Peak Communications Site EIR, 91-EIR-12. February 1992.
- Tenford and Kuane. Health Physics 53:585-606. 1987.
- U.S. Department of Energy. Contractors' Conference, EPRI Survey of Residential Magnetic Field Sources. L.E. Zaffanella and G.B. Johnson, November 1993.
- Wong, John S., Staff Counsel, Division of Ratepayer Advocates, California Public Utilities Commission. Order Instituting Investigation on the Commission's own motion to develop policies and procedures for addressing the potential health effects of electric and magnetic fields of utility facilities. (Sacramento: California Public Utilities Commission, 1991.)

APPENDIX A - SOURCES OF EMF AND THEIR FIELD STRENGTH CHARACTERISTICS HEALTH EFFECTS SUMMARY SOURCES OF ELECTROMAGNETIC FIELDS

Sources of ELF fields are found throughout our daily lives, in and around our homes. It is virtually impossible to live in modern society without exposing one's self to some of these sources of EMFs. Higher frequency EMF sources which generate potentially harmful effects are not as common in our day-to-day lives, and in general expose fewer people. The reason for this is that transmitting communications facilities, such as radio and microwave broadcast facilities, are generally sited in sparsely populated areas. It is also important to note, that in the case of both low and high frequency EMFs, the energy/fields or power density radiated (both electric and magnetic) will generally decrease sharply with distance from any radiating source in keeping with the inverse square law. That is, each time distance from the source is doubled, the power density will decrease by a factor of four (S.B. County Planning and Development Department, 1992). Figures 1 and 2 illustrate the decreasing electric and magnetic fields associated with transmission, distribution, and household appliances.

As mentioned previously, there are two types of EMFs that are of primary concern: 1) the non-linked electric and magnetic fields associated with extremely low frequencies (ELFs), and 2) the linked electric and magnetic fields constituting radiofrequency radiation (RFR) that is associated with the higher frequencies used for communications, radar, and microwave equipment.

Common sources of Extremely Low Frequency fields include the following:

- Power lines
- Motors & generators
- Transformers, electrical distribution panels, switchgear
- Electrical appliances
- Electric blankets, heating pads, water bed heaters
- Electric resistance heating
- Florescent lighting
- Electric (Analog) clocks
- Home and commercial building wiring
- Metal water pipes, gas line, cable TV, telephone cables (grounds)

Common sources of Radio Frequency emissions include the following:

- Radio and television transmission facilities
- Microwave and cellular facilities
- Radios, TV's, computers & computer monitors, etc.
- Microwave ovens, induction cook tops

HEALTH EFFECTS SUMMARY

Sykes and Li, 1990, have briefly summarized the four effects that are currently under discussion based upon scientific research currently available. These include:

Changes in cell activity. Exposure to ELF fields can cause changes in calcium flow through the cell membrane, changes in the immune response by cells, and changes in RNA transcription.

Interactions with the nervous system. Animal studies have shown a consistent effect of electric fields on the secretion of certain neurohormones which administer the circadian rhythms, but the effect is demonstrated only at certain field frequencies and intensities. Some studies have reported altered sensory response and stress response.

Variations in reproduction and development. ELF field exposure may be associated with abnormal embryo development for some specific circumstances and may affect brain development.

Effects on cancer promotion. No evidence of initiating cancer by exposure to ELF fields has been found. Laboratory studies on immune response, RNA transcription and circadian rhythms, and epidemiological surveys have suggested that ELF fields might play some role in promoting cancer, but the kind of cancer promotion is still inconclusive.

10. GEOLOGIC CONSTRAINTS GUIDELINES (Approved by the Board of Supervisors August 1993)

The purpose of these guidelines is to provide preliminary criteria for determining whether a particular activity could have a potentially significant impact on the environment as described in Section 15064 of the State CEQA Guidelines. Because geologic conditions are highly variable within Santa Barbara County, these guidelines are not fixed thresholds upon which a determination of significant impact would be made. They serve to point out when further study of site-specific conditions is required in order to assess geologic impacts. The level of project geologic impacts (i.e. potentially significant, potentially significant but subject to effective mitigation or not significant) is made by the Planning and Development Department staff (in consultation with licensed geologists and engineers as necessary) upon review of project plans, proposed mitigation measures and site-specific geologic information.

Impacts are considered potentially significant if the proposed development activity, including all proposed mitigation measures, could result in substantially increased erosion, landslides, soil creep, mudslides and unstable slopes (Appendix G(q), CEQA Guidelines). In addition, impacts are considered significant when people or structures would be exposed to major geologic hazards upon implementation of the project (Appendix G(r), CEQA Guidelines).

Impacts related to geology have the potential to be significant if the proposed project involves any of the following characteristics:

1. The project site or any part of the project is located on land having substantial geologic constraints, as determined by the Planning and Development Department or the Public Works Department. Areas constrained by geology include parcels located near active or potentially active faults and property underlain by rock types associated with compressible/collapsible soils or susceptible to landslides or severe erosion. Special Problem Areas designated by the Board of Supervisors have been established based on geologic constraints, flood hazards and other physical limitations to development.
2. The project results in potentially hazardous geologic conditions such as the construction of cut slopes exceeding a grade of 1.5 horizontal to one vertical.
3. The project proposes construction of a cut slope over 15 feet in height as measured from the lowest finished grade.
4. The project is located on slopes exceeding 20 percent grade.

Mitigation measures may reduce impacts to a less than significant level. These measures would include minor project redesign and engineering steps recommended by licensed geologists and engineers subsequent to detailed investigation of the site.

11. GROUNDWATER THRESHOLDS MANUAL FOR ENVIRONMENTAL REVIEW OF WATER RESOURCES IN SANTA BARBARA COUNTY

(Prepared by Brian Baca, Registered Geologist, revised and updated August 20, 1992)

A. Introduction.

1. **Threshold of Significance.** The Threshold of Significance is the point at which a project's estimated contribution to the overuse of groundwater in an alluvial basin or other aquifer is considered significantly adverse. This manual documents the methods used to establish the threshold values for groundwater extractions from the various alluvial basins and consolidated rock aquifers in Santa Barbara County. Note that the California Supreme Court has ruled that an EIR must be prepared whenever it can be fairly argued on the basis of substantial evidence that a project may have a significant environmental impact. Implementation of CEQA requires that a lead agency (such as the county) determine what constitutes a potentially significant effect.

In the past, thresholds for the alluvial basins have been determined based on a fixed number of acre-feet per year (AFY), a percentage of existing overdraft, or a percentage of safe yield. In the most recent editions of this manual, the threshold has been calculated from a standard formula which included factors of available storage and overdraft. In this update of the manual, a new methodology developed by the Planning and Development Department is used. A threshold was chosen for an idealized "Standard Reference Basin" based on a percentage loss of the remaining life of the available storage. Thresholds for the other basins are proportional to this value based on relative size and remaining life. This method was developed to simplify the calculations and more clearly link the various threshold levels to the environmental circumstances specific to each basin.

The Threshold of Significance for consolidated rock ("bedrock") aquifers is considered the amount of new pumpage by a proposed project which would place the aquifer in a state of overdraft. This criteria has remained the same since adoption of the first thresholds manual in 1983.

The groundwater Thresholds of Significance apply to all projects subject to discretionary review by the County of Santa Barbara.

2. **Water resources in Santa Barbara County.** Water supplies in Santa Barbara County come from two sources:
 - a. Surface water impounded behind dams on the Santa Ynez River augmented by infiltration into delivery tunnels drilled through the Santa Ynez Mountains.
 - b. Groundwater pumped primarily from the fourteen alluvial basins. Additional water is produced from bedrock aquifers in the hills which surround the alluvial basins.

These supplies are limited. Long-term average annual yields of the surface reservoirs, as currently constructed, are fixed values subject only to downward adjustment due to siltation or the occurrence of a new worst-case drought. Groundwater supplies are limited in terms of the annual amount of water which can be withdrawn without causing a long term drop in water levels ("Safe Yield") and in the amount of total storage of a basin which can be removed without significant environmental effects ("Available Storage"). These limits make

conservative use of water a necessary policy in Santa Barbara County in order to avoid or minimize significant and lasting adverse environmental effects.

Figures 1a and 1b illustrate the location of the major alluvial basins in Santa Barbara County. Also shown are the Ellwood/Gaviota and Gaviota/Point Conception areas dominated by bedrock pumpage.

- 3. Environmental concerns in alluvial basins.** Adverse environmental effects which can be caused by overdraft of an alluvial groundwater basin include:
 - a. Degradation of water quality.** Water quality varies considerably from one basin to another. In general, water quality in the groundwater basins of Santa Barbara County is declining with continued use of the resource, particularly in areas where the water table has been significantly lowered. Factors attributable to man which contribute to continuing degradation include pollution by agricultural runoff waters laden with fertilizers and pesticides, percolation of water from public and private sewage treatment systems, use of imported water which increases the salt load on a basin, percolation of polluted urban runoff, the reduction of the natural "flushing" effect of water through-flow caused by lowered water levels and the upward or lateral influx of connate brines by over-pumping of the freshwater aquifers. Preventive measures are the best way to address the ongoing deterioration. In general, the amount of pollutants placed in the ground, and the level of overdraft in the basins, should be minimized.
 - b. Saltwater intrusion.** Intrusion of marine salt water is a problem which could affect all of the coastal basins of Santa Barbara County. Unfortunately, few data are available on its occurrence in the past. Recent USGS studies have shown that salt water has intruded a few hundred feet onshore in Storage Unit No. 1 of the "Santa Barbara City Basin." Computer modeling conducted as part of this work indicated that the rate of salt water advance was four times greater than the rate at which the salt water could be flushed out by natural processes. Prevention of salt water intrusion is thus a key concern of projects supported by coastal pumpage.
 - c. Land subsidence.** Land subsidence can occur in alluvial basins where water levels have dropped due to pumpage. Substantial evidence has not been reported in Santa Barbara County. Subsidence in the overdrafted Goleta Basin has undoubtedly occurred but most of it probably took place many decades ago when the lower aquifers were first penetrated (according to the County Water Agency). Land subsidence can be a significant problem which can damage structures erected above a local cone-of-depression caused by extensive pumping.
 - d. Loss of well yield.** Dropping water levels in a basin due to overdraft will reduce the rate at which individual wells will be able to produce water. Drilling more wells or deeper wells are the two methods of maintaining groundwater production to service a particular municipal or agricultural demand. There are, however, technical, legal and economic limitations on the ability of individuals or public or private purveyors to use these methods. With these limitations, it is likely that continued drop in water levels due to overdraft will cause loss of agriculture and a reduction in the ability of water districts to serve existing demand.
 - e. Well interference.** New pumpage as part of a proposed project may cause a loss of well yield in nearby wells due to 1) a drop in water level as a cone-of-depression

develops, or 2) a drop in water level due to storage depletion in a small isolated area. This could result in the current use on adjacent parcels being no longer supportable by the existing well(s).

- f. Reduction of surface water available to support biological resources.** Pumpage of groundwater causes fluctuations over time in the elevation of the groundwater table. Lowering of the water table can effect biological resources on the land surface by reducing access to water by deep-rooted native vegetation or by reducing discharge of groundwater (baseflow) in streambeds. Even if a basin were pumped at a hydrologic "safe yield" rate (long-term water levels remain stable) a drop in water levels during a drought could adversely affect biologic resources.

In nearly all cases, an individual project's effect on biological resources would not have a discernable local effect as the new pumpage would add incrementally to the regional change in water levels. Thus, the thresholds of significance included herein would adequately address this impact. Under certain conditions, however, a local pumping depression could adversely affect a specific habitat area. In this case, the effects would need to be analyzed in the biologic resources section of the project environmental document.

- 4. Environmental concerns in consolidated rock aquifers.** Consolidated rock aquifers are generally less extensive and have much smaller annual safe yield values than the alluvial basins. Environmental concerns associated with these aquifers include degradation of water quality, long-term loss of well yield, well interference and effects on biological resources. The discussion of these concerns presented above for alluvial basins applies to consolidated rock aquifers except for biological resources. Pumpage of consolidated rock aquifers has a direct effect on average annual flows downstream of the well site. This is because a pumpage-related drop in water levels (from native conditions) will lessen or eliminate baseflow out of the aquifer and induce groundwater recharge by stream flows. The reduction in flows represented by typical safe yield (potential average annual recharge) values estimated for hardrock aquifers is usually only a small proportion of the total average annual streamflows and would not likely result in substantial impacts on downstream riparian habitat. In certain cases where the proposed pumpage would cause a substantial reduction (as determined by the Planning and Development Department geologist) in streamflow and an environmentally sensitive habitat were present downstream, the effects on that habitat should be addressed in the biological resources section of the environmental document. The existence of a local critical habitat supported by aquifer baseflow and occupied by a rare or endangered species would also need to be addressed in the biologic resources section.

The basis for the assessment of impacts on groundwater resources due to pumpage of consolidated rock aquifers is the avoidance of overdraft (see discussion on Thresholds, this document).

Groundwater Thresholds Manual for Environmental Review of Water Resources in Santa Barbara County

TABLE 1 – SUMMARY OF GROUNDWATER BASIN CONDITIONS
 Data from County Water Agency and Division of Environmental Review as of March 1992
 By Brian R. Baca, 6/92 (file thresh4.wk3) Revised 8/92

Basin	Return Flow Factor (Gross-To-Net)	Available Storage	Gross Pumpage (AFY)			Net Pumpage (AFY)		
			Current Use	Estimated Safe Yield	Surplus (Overdraft*)	Current Use	Estimated Safe Yield	Surplus Overdraft
Carpinteria	.90	50,000	4238	4294	56	3814	3865	51
Montecito	.90	16,000	1823	1350	473*	1641	1215	426 *
Toro Canyon	.90	650	242	300	58	218	270	52
Foothill	.95	5000	1095	953	142*	1040	905	135*
City of Santa Barbara	.95	10,000	619	847	228	588	805	217
Goleta North/Central	.95	18,000	5167	3600	1567*	4908	3420	1488*
Goleta West	.95	10,000	See note below					
More Ranch	.90	600	24	84	60	22	76	54
Buellton Uplands	.74	153,800	2898	1766	1132*	2133	1300	833*
Santa Inez Uplands	.78	900,000	14,100	11,500	2600*	10,998	8970	2028*
Lompoc	.67	170,000	31,087	28,537	2550*	23,386	21,468	1918*
San Antonio	.75	800,000	19,441	8667	10,774*	15,431	6500	8931*
Santa Maria	.70	1,100,000	149,300	118,500	30,800*	103,800	83,800	20,000*
Cuyama	.75	1,500,000	48,700	10,667	38,033*	36,525	8000	28,525*
S. Y. River Riparian	N/A	90,000	Not subject to overdraft*					

Note on the Goleta North/Central Basin: The overdraft status of the Goleta North/Central Basin is based on pumpage by various private and public entities over the last decade. Overdraft of this basin is not projected to continue as a result of the court judgment in the Wright vs. Goleta Water District lawsuit and the efforts of the GWD to comply with the judgment. The judgment requires that the GWD return the basin to a state of hydrologic balance by 1998. GWD actions to meet this mandate include:

1. Adoption of the Water Supply Management Plan.
2. Adoption of ordinance 91-2 ("WET" Initiative: Desalination Supply).
3. Voter approval of revenue bonds for the State Water Project.
4. construction of the GWD/GSD waste water reclamation plant.
5. permanent water conservation programs.

On July 14, 1992 the Board of Supervisors determined that water service to Wright litigants and other holders of can-and-will-serve letters from the Goleta Water District does not have the potential to cause overdraft. Projects fitting in this description are therefore exempt from environmental review as it pertains to questions of groundwater overdraft.

Note on the Goleta West Basin: The status of the Goleta West Basin (or Subbasin) has not yet been resolved. This is because of uncertainty associated with several well exchange/service agreements between Planning and Development Department and Goleta Water District staff and landowners in the West Basin. The issue is the subject of ongoing discussions between the Planning and Development Department and Goleta Water District staff and is anticipated to be resolved by late 1992.

TABLE 2 - GROUNDWATER THRESHOLDS 1992 UPDATE

Revised Methodology for Determining Threshold of Significance

By Brian R. Baca, 6/92 (File "thresh2b.wk3") Revised 8/20/92

METHODOLOGY

An idealized reference basin having overdraft and storage characteristics similar to the overdraft basin with the greatest remaining life (Santa Ynez uplands) was chosen as a standard. The Threshold of Significance for this reference basin was set at an amount (61.9 AFY) that if added to the assumed overdraft would result in the loss of three percent of the remaining life of the Available Storage. The Threshold values for the actual basins are proportional to the Threshold for the reference basin based on the relative length of remaining life and the relative size of the basin. Remaining life is weighted at 75 percent; size at 25 percent. Threshold values are rounded to the nearest 1 AFY for use in project environmental review.

STANDARD REFERENCE BASIN

Net Overdraft (AFY)	Available Storage (AF)	Remaining life of Av. Strg. (Years)	Threshold of Significance Based on 3.000% Loss of Remaining Life of Avail. Stor.	Formula for Calculation of Reference Basin Threshold of Significance (x) in AFY. (3% loss of remaining life)
2000.000	900000.000	450.000	61.856 AFY	$\frac{900000 \text{ AF}}{2000 \text{ AFY} + (x)} = 450 \text{ years} * .97$
a	b	c	d	

OVERDRAFTED/OVERCOMMITTED BASINS

Basin	Net Overdraft (AFY)	Available Storage (AF)	Remaining Life of Av. Strg. (Years)	Ratio to Standard Reference Basin		Combined Ratio (1) @ 75% (2) @ 25%	Calculated Threshold of Significance (Combined Ratio x 61.856)	Applied Threshold of Significance (AFY)
				Remaining Life (R.L./c)	Available Storage (A.S./b)			
Santa Ynez Uplands	2028.00	900000.000	443.787	0.986	1.000	0.990	61.215	61
Buellton Uplands	833.000	153,800.000	184.634	0.410	0.171	0.350	21.677	22
San Antonio	8931.000	800,000.000	89.576	0.199	0.889	0.372	22.980	23
Lompoc	1918.000	170,000.000	88.634	0.197	0.189	0.195	12.058	12
Santa Maria	20,000.000	1,100,000.000	55.000	0.122	1.222	0.397	24.570	25
Cuyama	28,525.000	1,500,000.000	52.585	0.117	1.667	0.504	31.194	31
Montecito	426.000	16,000.000	37.559	0.083	0.018	0.067	4.147	4
Foothill	135.000	5000.000	37.037	0.082	0.006	0.063	3.904	4
Goleta North/Central	1488.000	18,000.000	12.097	0.027	0.020	0.025	1.556	2

BASINS IN SURPLUS (No Threshold of Significance Applies)

Basin	Net Overdraft (AFY)	Available Storage (AF)
Carpinteria	0.000	50,000.000
City of Santa Barbara	0.000	10,000.000
Toro Canyon	0.000	650.000
More Ranch	0.000	1200.000

B. Environmental Review of Water Resources.

- 1. Alluvial basins.** The relative significance of proposed new withdrawals from a groundwater basin must be assessed in the preparation of an environmental document (ND, EIR) pursuant to the California Environmental Quality Act. This is done through calculation of specific "Thresholds of Significance" for each of the overdrafted basins in Santa Barbara County. No threshold is established for a basin in a state of surplus. A project in such a basin would be subject to a threshold only if it would use more than the remaining surplus. In an overdrafted basin, projected net new consumptive water use of a project which exceeds the calculated threshold for that particular basin is deemed a significantly adverse environmental impact. This determination during the initial study would require the preparation of an Environmental Impact Report. If the estimated water use remains above the Threshold of Significance in the final analysis, the impact of the project on water resources, would, as stated above, be considered significant (Class I) and the project would require a finding of Overriding Considerations by the decisionmakers for approval.

Thresholds of Significance are calculated from hydrologic parameters for each of the basins in a state of overdraft. The size of the basin and the level of net annual overdraft are the key factors upon which the threshold is based. Current status of the basins is summarized in Table 1. The method used to establish the appropriate values for each basin involves setting a threshold for an idealized "Reference Basin" having overdraft and storage characteristics similar to the overdrafted basin with the greatest remaining life (Santa Ynez Uplands) based on a percentage loss of the estimated remaining life of the available storage. Thresholds for the other basins are proportional to this value based on the relative size and remaining life. A detailed explanation and a worksheet illustrating all the figures used in the calculation and the results are included on Table 2. Threshold values of 2 AFY to 61 AFY are herein established for the eight overdrafted/overcommitted basins in Santa Barbara County.

Definitions of the key parameters are as follows:

Safe Yield - The maximum amount of water which can be withdrawn from a basin (or aquifer) on an average annual basis without inducing a long-term progressive drop in water level.

Available Storage - Available storage is the volume of water in a particular basin which can be withdrawn without substantial environmental effects. This storage reflects the amount of water in the basin on a long-term basis (a point on a long-term trend line) not the current storage level in the basin. The number will be periodically updated by the Planning and Development Department and the County Water Agency as new information becomes available.

Net Annual Overdraft - The amount by which average long term demand on a basin exceeds the safe yield of the basin after allowances have been made for return flows. The "demand" figure will generally include commitments of supply such as approved projects not yet constructed with the estimated current level of pumpage.

Portions of Santa Barbara County, especially the South Coast, are served by water districts which distribute both surface water from the Santa Ynez River watershed and groundwater pumped from local basins. For environmental review purposes, the surface supplies are considered to be the first element of supply committed to existing demand. Thus, the water use of a new development is assumed to come entirely from the groundwater basin.

New supplemental supplies of water in the process of development in Santa Barbara County include desalination of sea water, wastewater reclamation and importation of water through the State Water Project. Upon determination that a new source is available over the long term, a project supported by that source would not be subject to the groundwater thresholds of significance. If water from a new source were to offset current pumpage on a long-term basis, the Threshold of Significance would be revised to reflect the lowered pumpage.

- 2. Consolidated rock aquifers.** The methodology for determining the threshold of significance for water use in consolidated rock (bedrock) aquifers is based on whether the proposed usage would place the aquifer in a state of overdraft. In order to make this determination it is necessary to define the boundaries of the aquifer and to estimate the potential average annual recharge (i.e. Safe Yield) available within the defined boundary.
 - a. Aquifer boundaries.** Bedrock aquifers in Santa Barbara County generally extend for long distances along bedding strike. On the south flank of the Santa Ynez Mountains, the Miocene and Eocene bedrock formations crop out in a continuous band crossing the intermontane watersheds from the Santa Barbara area to near Point Conception. The sandstone (and sometimes fractured shale) aquifers in these formations are variable in their hydrologic characteristics but are generally far less permeable and productive than unconsolidated alluvial sediments. They are also interbedded with relatively impermeable marine and non-marine shales and mudstones. Clearly, a well pumping at any one point cannot access the water in storage and the potential recharge (i.e. safe yield) over the entire trend. Pumping effects extending further than a few thousand feet cannot be assumed. For purposes of analysis it is necessary to divide these aquifers into units in which the storage and potential recharge attributable to that unit can be presumed to be accessed from a single location. The watershed divides (ridgelines) are designated as aquifer boundaries for purposes of environmental review. Using watershed areas to define and analyze the bedrock aquifers have several advantages: 1) the boundaries are clearly delineated, 2) most wells are drilled in canyon bottoms and, thus, the topographic divide would occur at the approximate midpoint between pumping centers and 3) the watershed area is directly related to a major source of potential recharge, stream seepage. It must be recognized, however, that the watershed boundaries, a surface feature, do not represent barriers to subsurface groundwater flow. For this reason a well located near a watershed boundary could draw water from an adjacent watershed and access the yield attributable to that watershed. Based on observed well drawdown effects in the Vaqueros Formation at two locations in the Ellwood/Gaviota area, it will be assumed in the analysis of Vaqueros aquifers that a well located within 800 feet of a watershed boundary will access the yield attributable to the adjacent watershed. The combined safe yield of the affected watersheds (and the combined existing demands) will be used to assess a project's impact on groundwater resources. A "radius of influence" greater or less than 800 feet may be used if justified based on site-specific geologic or hydrologic data. In other formations, the ridgeline boundary criteria will be used unless site-specific data is available which better defines the aquifer limits.

The boundary of the "aquifer" in the stratigraphic sense is also necessary to define. In a geologic formation or subunit predominated by sandstone (presumably fractured) a well in any part of that unit is assumed capable of accessing all of the potential recharge to that unit. Specific examples on the South Coast would be the Vaqueros

and Coldwater Formations. Note that site specific geologic information could require that these formations be divided into subunits (as determined by the Planning and Development Department Geologist). In a unit comprised of interbedded permeable and non-permeable units the aquifer is defined as the stratigraphic interval to which the well is hydrologically connected (i.e. the screened or gravel packed interval). The Sespe Formation is an example of the type of geologic unit which would be subject to this definition.

As a reasonable worst case, faults are considered to be barriers to groundwater flow. The aquifer boundaries used in environmental review would reflect this assumption.

b. Safe Yield.

- (1) **Introduction.** In past Thresholds manuals, potential average annual recharge to an aquifer, or "safe yield", was estimated based on a percentage of total average annual precipitation in the watershed above the aquifer under study. A figure of 4.75 percent of the total precipitation was assigned to the aquifer as safe yield based on values obtained from the USGS study of the Ellwood to Gaviota area by Miller and Rapp (1968). The 4.75 percent figure was, however, taken out of context and used incorrectly. This figure is an estimate of field recharge (direct percolation of rainwater) over an entire watershed area and does not reflect the field recharge attributable to the outcrop area of a single aquifer (or group of aquifers) within the watershed. The field recharge of any single aquifer is generally far less than that for the entire watershed. This method also did not account for induced recharge (stream seepage and subsurface underflow) due to the drop in aquifer water level with pumpage. A new methodology which accounts for sources of direct recharge (field recharge and stream seepage) and indirect recharge (subsurface underflow) is described below. This methodology was jointly developed by the Division of Environmental Review and the County Water Agency. *(A program diskette including instructions is available from the Planning and Development Department.)*
- (2) **Direct recharge.** Direct recharge refers to the infiltration of surface water into the aquifer. This can occur as either field recharge (the direct penetration of rainfall) or as seepage from flowing streams.
- (3) **Field recharge.** Field recharge has been estimated by a variety of methods. Miller and Rapp (1968) made their estimate of 4.75 percent of total average annual rainfall based on groundwater discharge or baseflow out of the watersheds from Ellwood to Gaviota. Blaney (1933) measured actual recharge in an alluvial setting in Ventura County for several years and developed graphic curves ("Blaney curves") which relate annual rainfall to infiltration. Another method developed by the Soil Conservation Service (SCS) involves modeling of a "soil reservoir." When the inputs to the reservoir (rainfall) exceed output (evapo-transpiration of vegetation and runoff) and soil reservoir storage capacity deep penetration to groundwater is assumed to occur. This "Soil Moisture Balance" methodology involves the use of monthly rainfall data and allows for input of site specific parameters such as vegetation type, soil type and the amount of irrigation water applied to the surface outcrop. The Blaney Curve method uses only annual rainfall data and does not allow for input of site specific data. Miller

and Rapp's figure is very general and averages together aquifers and non-aquifers with different vegetation, soil types and average rainfall. Given these comparisons, Soil Moisture Balance analysis is considered the best method for estimating field recharge and will be applied to aquifer outcrop area when adequate (as determined by the Planning and Development Department) monthly rainfall data is available. In the absence of such data one of the other two methods (Blaney Curves, Miller and Rapp) will be used.

Estimates of field recharge using the soil moisture balance method involve preparation of a computer spreadsheet which applies monthly values of rainfall, applied water (if any), runoff and potential vegetation evapotranspiration to a model of the "soil reservoir" based on rooting depth and soil moisture holding capacity. An example of this spreadsheet is presented as Table 3. Key parameters used in this analysis are described below:

- (a) **Applied water.** Monthly irrigation amount applied to crop planted on top of aquifer outcrop. Monthly amounts based on 1) total annual use divided proportional to the monthly values for plant potential evapotranspiration or 2) crop irrigation schedule according to Cooperative Extension or California Dept. of Water Resources.
- (b) **Rainfall.** Values from an appropriate nearby rain gauge(s) monitoring by the Santa Barbara County Flood Control District. (Refer to Precipitation Data Report, 1990).
- (c) **Runoff factor.** The portion of precipitation which goes to runoff is not available for deep percolation. Until detailed studies are completed an average figure of 20 percent (80 percent effective rainfall) will be used. This figure is rounded from the 19 percent cited by Miller and Rapp (1968).
- (d) **Moisture capacity.** This figure refers to the ability of a particular soil type to hold water by capillary force. It is measured in inches of water per inch of soil. The figure used in the analysis will be that listed for the aquifer outcrop area in the SCS soil survey for Santa Barbara County. If an SCS value is unavailable, a value determined by the Planning and Development Department geologist will be used.
- (e) **Rooting depth.** Vegetation rooting depth equals the thickness of the soil reservoir. The values used are based on USGS reports, information provided by the farm advisor and other studies.
- (f) **Soil reservoir capacity.** This figure is the product of the moisture capacity times the rooting depth. It represents the total amount of water (in inches) that can be held in the soil reservoir. If additional water is added beyond this amount it is presumed to percolate to groundwater.
- (g) **Potential evapotranspiration.** The potential evapotranspiration annual curve used in the analysis will be based on USGS reports, evapotranspiration measurements at CIMIS stations, vegetation water use studies by the State Department of Water Resources or other related studies.

Water yield shown in the last column on Table 3 represents the amount of water

available to the soil reservoir in excess of the moisture holding capacity of the soil reservoir and the potential evapotranspiration of the vegetation. The monthly values are averaged over a long period of time (decades) to obtain a figure for average annual recharge in AFY per acre of aquifer outcrop. This figure is multiplied times the aquifer acreage and rounded to the nearest one AFY to obtain average annual field recharge.

- (4) **Stream seepage.** Under native conditions (no pumping) bedrock aquifers in mountain areas (e.g. the Santa Ynez Mountains) have water levels at or near the elevation of the streambed. During and after the rainy season, water which has infiltrated into the aquifer as field recharge, discharges into the creek (baseflow). Seepage from streams does not occur because the aquifer is full and, at times, spilling. A drop in aquifer water level due to well pumpage will induce recharge from stream flows as well as reducing (or eliminating) baseflow out of the aquifer.

Magnitude of potential stream seepage depends on stream flow rates, streambed geometry, a seepage rate and the length of stream which crosses the aquifer outcrop. The County Water Agency (CWA) has developed a model which relates all of these factors and provides an estimate of long-term average annual recharge attributable to stream seepage. This model is based on 39 years of daily flows recorded at the USGS gauging station in San Jose Creek. It contains a function which calculates daily stream width (wetted surface width) at various flow rates over the 39 year period for a given channel geometry. Using this function and a stream seepage rate in gallons per day per square foot of wetted surface area a potential annual average seepage figure (in AFY) can be obtained. The information needed to perform this analysis on any particular aquifer is listed below:

TABLE 3
Example Soil Moisture Balance Analysis Spreadsheet

VAQUEROS FORMATION, ELLWOOD CANYON
SOIL MOISTURE BALANCE ANALYSIS
Rainfall data 1941-1979 (modified from Dos Pueblos Ranch)
Oaks and brush veg. cover (Rooting depth = 14')
Sandy soil (Moisture Capacity = .07 in./in. from SCS)
Soil reservoir capacity = 11.76 inches (14' x 12"/ft x .07"/in.)
Runoff as % of precipitation = 20

Month	Applied Water	Rainfall (Inches)	Runoff factor (.9 = 10% runoff)	Effective rainfall (Inches)	Initial Soil Moisture (Inches)	Total Available Moisture (Inches)	Potential ET (Inches)	Final Soil Moisture (Inches)	Water Yield
1940 Aug	0	0	0.8	0	0	0	8.71	0	0
1940 Sept	0	0	0.8	0	0	0	5.25	0	0
1940 Oct	0	0.95	0.8	0.76	0	0.76	2.07	0	0
1940 Nov	0	0.54	0.8	0.432	0	0.432	1.21	0	0
1940 Dec	0	11.26	0.8	9.008	0	9.008	1.21	7.798	0
1940 Jan	0	12.22	0.8	9.776	7.798	17.574	1.64	15.934	4.174
1940 Feb	0	10.37	0.8	8.296	11.76	20.056	2.87	17.186	5.426
1940 Mar	0	14.79	0.8	11.832	11.76	23.592	4.54	19.052	7.292
1940 Apr	0	6.94	0.8	5.552	11.76	17.312	6.17	11.142	0
1940 May	0	0.01	0.8	0.008	11.142	11.15	8.33	2.82	0
1940 June	0	0	0.8	0	2.82	2.82	7.79	0	0
1940 Jul	0	0.04	0.8	0.032	0	0.032	8.64	0	0
1941 Aug	0	0.01	0.8	0.008	0	0.008	8.71	0	0
1941 Sept	0	0	0.8	0	0	0	5.25	0	0
1941 Oct	0	1.12	0.8	0.896	0	0.896	2.07	0	0
1941 Nov	0	0.56	0.8	0.448	0	0.448	1.21	0	0
1941 Dec	0	6.31	0.8	5.048	0	5.048	1.21	3.838	0
1941 Jan	0	1.01	0.8	0.808	3.838	4.646	1.64	3.006	0
1941 Feb	0	0.95	0.8	0.76	3.006	3.766	2.87	0.896	0
1941 Mar	0	2.22	0.8	1.776	0.896	2.672	4.54	0	0
1941 Apr	0	4.03	0.8	3.224	0	3.224	6.17	0	0
1941 May	0	0	0.8	0	0	0	8.33	0	0
1941 June	0	0	0.8	0	0	0	7.79	0	0
1941 Jul	0	0	0.8	0	0	0	8.64	0	0
1942 Aug	0	0	0.8	0	0	0	8.71	0	0
1942 Sept	0	0.04	0.8	0.032	0	0.032	5.25	0	0
1942 Oct	0	1.82	0.8	1.456	0	1.456	2.07	0	0
1942 Nov	0	0.78	0.8	0.624	0	0.624	1.21	0	0
1942 Dec	0	1.72	0.8	1.376	0	1.376	1.21	0.166	0
1942 Jan	0	16.21	0.8	12.968	0.166	13.134	1.64	11.494	0
1942 Feb	0	5.32	0.8	4.256	11.494	15.75	2.87	12.88	1.12
1942 Mar	0	3.69	0.8	2.952	11.76	14.712	4.54	10.172	0
1942 Apr	0	1.16	0.8	0.928	10.172	11.1	6.17	4.93	0
1942 May	0	0.04	0.8	0.032	4.93	4.962	8.33	0	0
1942 June	0	0	0.8	0	0	0	7.79	0	0
1942 Jul	0	0	0.8	0	0	0	8.64	0	0
•									
1977 Aug	0	0	0.8	0	0	0	8.71	0	0
1977 Sept	0	0	0.8	0	0	0	5.25	0	0
1977 Oct	0	0	0.8	0	0	0	2.07	0	0
1977 Nov	0	0	0.8	0	0	0	1.21	0	0
1977 Dec	0	6.1	0.8	4.88	0	4.88	1.21	3.67	0
1977 Jan	0	11.39	0.8	9.112	3.67	12.782	1.64	11.142	0
1977 Feb	0	14.81	0.8	11.848	11.142	22.99	2.87	20.12	8.36
1977 Mar	0	14.77	0.8	11.816	11.76	23.576	4.54	19.036	7.276
1977 Apr	0	2.83	0.8	2.264	11.76	14.024	6.17	7.854	0
1977 May	0	0	0.8	0	7.854	7.854	8.33	0	0
1977 June	0	0	0.8	0	0	0	7.79	0	0
1977 Jul	0	0	0.8	0	0	0	8.64	0	0
1978 Aug	0	0	0.8	0	0	0	8.71	0	0
1978 Sept	0	1.12	0.8	0.896	0	0.896	5.25	0	0
1978 Oct	0	0	0.8	0	0	0	2.07	0	0
1978 Nov	0	3.55	0.8	2.84	0	2.84	1.21	1.63	0
1978 Dec	0	1.58	0.8	1.264	1.63	2.894	1.21	1.684	0
1978 Jan	0	6.16	0.8	4.928	1.684	6.612	1.64	4.972	0
1978 Feb	0	6.81	0.8	5.448	4.972	10.42	2.87	7.55	0
1978 Mar	0	5.95	0.8	4.76	7.55	12.31	4.54	7.77	0
1978 Apr	0	0	0.8	0	7.77	7.77	6.17	1.6	0
1978 May	0	0	0.8	0	1.6	1.6	8.33	0	0
1978 June	0	0	0.8	0	0	0	7.79	0	0
1978 Jul	0	0	0.8	0	0	0	8.64	0	0
TOTAL =		918.21						62.674	
ANN.AVG. =		23.5438462					ANN. AVG. RECHARGE	in./year 1.60702564	AFY/acre 0.1339188

TABLE 4a - Example of Recoverable Water Worksheet

SAN JOSE CREEK WATERSHED RECOVERABLE WATER WORKSHEET
 (FOLLOWS PROCEDURE DEVELOPED IN USGS PROFESSIONAL PAPER 417-E)

Altitude Range (ft. MSL)	Wtrshd Area (Acres)	Area % of Wtrshd	Rainfall (P) (in inches)	Potential ET (E, in.)	P/E	R/E	Recoverable Water (R)	Adjusted R (= K*R)	Watershed Loss (L)
2500 - 3000	510	14.5%	30.00	54.00	0.56	0.103	5.54	7.20	22.80
2000 - 2500	1020	28.9%	29.00	55.50	0.52	0.085	4.74	6.16	22.84
1600 - 2000	637	18.1%	28.00	56.00	0.50	0.075	4.18	5.43	22.57
1200 - 1600	361	10.2%	27.00	56.00	0.48	0.067	3.73	4.86	22.14
800 - 1200	297	8.4%	25.50	55.20	0.46	0.058	3.22	4.19	21.31
400 - 800	404	11.5%	24.00	53.50	0.45	0.053	2.84	3.70	20.30
150 - 400	297	8.4%	22.00	51.00	0.43	0.047	2.39	3.11	18.89
TOTALS	3526	100.0%	27.30	54.79			4.11	5.34	21.96
Weighted Avgs.									

ADJUSTED RECOVERABLE WATER = 5.34 inches (weighted average over watershed).
 WATERSHED AREA = 3526 acres.
 WATERSHED RUNOFF IS ESTIMATED @ 1569 Acres Feet / Year.

GEOLOGIC INDEX:

Category	% of wtrshd	Index
A (* 10)	7%	70
B (* 100)	0%	0
C (* 0)	92%	0
D (* 100)	1%	100
E (* 10)	0%	0
F (* 20)	0%	0
G (* 40)	0%	0
TOTAL GEO INDEX =		170

The TOTAL GEO INDEX indicates a K value of 1.3 (see CHART on page E21 of 417-E).

TABLE 4b - Example of Recoverable Water Worksheet

SAN ONOFRE CREEK WATERSHED RECOVERABLE WATER WORKSHEET
 (FOLLOWS PROCEDURE DEVELOPED IN USGS PROFESSIONAL PAPER 417-E)

(File "onofre2.wk3")

Altitude Range (ft, MSL)	Wtrshd Area (Acres)	Area % of Wtrshd	Rainfall (P) (in inches)	Potential ET (E, in.)	P/E	R/E	Recoverable Water (R) (= K*R)	Adjusted R (= K*R)	Watershed Loss (L)
2000 - 2600	264	20.8%	22.00	55.40	0.40	0.036	1.99	2.59	19.41
1600 - 2000	222	17.5%	21.00	56.00	0.38	0.030	1.67	2.17	18.83
1200 - 1600	271	21.3%	20.00	56.00	0.36	0.025	1.42	1.85	18.15
800 - 1200	305	24.0%	19.00	55.20	0.34	0.022	1.24	1.61	17.39
400 - 800	158	12.4%	18.00	53.50	0.34	0.021	1.12	1.45	16.55
150 - 400	51	4.0%	17.00	51.00	0.33	0.020	1.03	1.34	15.66
0 - 150	0	0.0%	16.00	51.00	0.31	0.017	0.85	1.10	14.90
TOTALS	1271	100.0%	19.98	55.17			1.49	1.93	18.05
Weighted Avgs.									

ADJ. RECOVERABLE WATER = 1.93 inches (Watershed weighted mean runoff depth).
 WATERSHED AREA = 1271 Acres.
 CALCULATED WATERSHED RUNOFF IS 205 Acre Feet / Year.
 WATERSHED RUNOFF IS ESTIMATED @ 215 Acre Feet / Year.

GEOLOGIC INDEX: The TOTAL GEO INDEX indicates a K value of 1.3 (see CHART on page E21 of 417-E).

Category % of wtrshd	Index	
A (* 10)	70	
B (* 100)	0	SAN JOSE CREEK MULTIPLIER = 0.136243
C (* 0)	0	Vaqueros
D (* 100)	0	300
E (* 10)	0	600
F (* 20)	0	(Up to 300' added to (L) for subsurface underflow)
G (* 40)	0	POTENTIAL STREAM RECHARGE = 11.80314
TOTAL GEO INDEX =	70	(see Stream Seepage Curves)

- (a) **Stream flows.** Average annual runoff in the watershed above the aquifer under analysis is estimated using the procedure developed by Crippen in USGS Professional Paper 417-E (1965). This method accounts for elevation, watershed area, potential evapotranspiration, the isohyetal distribution of rainfall and rock type. The average annual runoff ("recoverable water") estimated by this method for San Jose Creek in Goleta was compared to the actual average runoff measured by the USGS daily flow gauge on that creek over a 39-year period (1940-79). The "Crippen estimate" of 1569 AFY (Table 4a) was very close to the 1576.8 AFY measured by the gauge. However, the gauged values are approximately five percent lower than they would be under native conditions because of stream diversions and minor percolation losses to the Goleta Groundwater Basin upstream of the gauging station. Thus, the average annual flows used for the seepage analysis will be the Crippen calculated value increased by five percent. Table 4b is an example recoverable water worksheet for San Onofre Creek. The estimated average annual flows for a watershed are distributed on a daily basis over the 39-year modeling period using the daily gauged flows at San Jose Creek. The runoff at a watershed under study (Crippen plus five percent) is divided by the 1576.8 AFY measured at the San Jose gauge to obtain a "San Jose Creek Multiplier". This multiplier is applied to the gauged daily flows at San Jose Creek to obtain a model of daily flows at the aquifer under analysis.

The point along the stream where flows are estimated (the downstream limit of the "watershed") will be placed near the downstream contact or limit of the aquifer 20 percent of the distance from that point to the upstream contact of the aquifer. This location is incorporated into the seepage modeling discussed below.

- (b) **Streambed geometry.** The streambed geometry incorporated into the model is based on field measurements of the creek in Ellwood Canyon at the northern outcrop of the Vaqueros Formation. This channel geometry is considered representative of creeks on the South Coast. Narrower channels occur in some areas which would allow for less seepage per unit of flow. Ellwood Canyon geometry will, however, be used unless site specific data is available.
- (c) **Seepage factor.** A seepage factor of 10 gallons per day per square foot of wetted surface area is used in the analysis. This factor is based on measurements of seepage made during controlled releases down Mission Creek in the City of Santa Barbara (Martin, 1984). This factor is used as the best available information but may be higher than the actual rate for consolidated rock aquifers. A figure of 15 gpd/ft² was measured in river gravels by the County Water Agency. Such gravels are far more permeable (orders of magnitude) than bedrock aquifers or the alluvial sediments in Mission Creek.
- (d) **Streambed length.** This length is measured from the upper to the lower geologic contacts of the aquifer along the streambed as delineated on the

USGS topographic map.

A table of monthly flow values calculated with the stream flow model for San Onofre Creek is presented in Table 5 based on the multiplier determined with the recoverable water worksheet. A table of seepage values is presented in Table 6. The seepage figures are generated from the estimated flows, the stream length and the seepage factor and streambed geometry parameters discussed above. The relationship between average annual potential stream seepage and the San Jose Creek multiplier is presented graphically on Figure 2. The stream seepage curves shown on this graph plot the multiplier versus the average annual potential seepage per 100 feet of aquifer exposed along the stream for various total effective exposure lengths. The different curves required for each value of effective aquifer exposure length reflects the fact that the stream flows in the downstream parts of an aquifer are reduced by percolation into the upstream parts the aquifer. As aquifer exposure length increases the average percolation per 100 feet of that exposure length progressively declines. The curves shown on Figure 2 are based on estimated flows at a point located 20 percent of the distance from the downstream contact or limit of the aquifer to the upstream contact of the aquifer. All analyses will incorporate this parameter.

In summary, once the appropriate multiplier and stream length are known, the potential seepage is readily estimated from the curves on Figure 2. For purposes of environmental review all values are rounded to the nearest 1 AFY.

A geologic circumstance which occurs in some canyons is where a thin body of alluvium partially fills the valley over the bedrock aquifer under study. It can be reasonably argued that clay layers within the alluvium prevents seepage of stream water into an underlying aquifer. It can also be reasonably argued that the alluvium enhances the potential recharge by increasing the area of hydrologic connection through which stream flow or underflow in the alluvium could recharge a bedrock aquifer. It would require detailed long term records of stream flows, water levels and pumpage along with several monitoring wells to document either effect. This data is rarely, if ever, available. For purposes of environmental review, the model-derived value will be used as the estimate of potential seepage from stream flow and underflow.

(f) **Indirect Recharge.** A drop in aquifer water level due to pumpage can induce underflow from adjacent consolidate rock units. Given that most of the sandstone aquifers in the county are either bounded by or interbedded with generally impermeable shales and mudstones, underflow cannot be counted on to provide substantial amounts of recharge. The stratified nature of the bedrock formations requires that water would have to flow across the bedding planes and through the least permeable stratigraphic layers. Increments of safe yield would be added by dropping water levels over an area of the adjacent formation such that additional direct recharge from rainfall or stream seepage be accessed. To account for potential recharge due to subsurface underflow, the area accessed by a well will be considered to extend 300 feet (measured horizontally) into the formation up-gradient of the aquifer, as defined using the guidelines in this manual, if that formation contains water-producing horizons (e.g. fractured

sandstones). The estimation of field recharge and potential stream seepage will be adjusted to allow for larger aquifer surface area and greater effective aquifer stream length.

Table 5 - Estimated Monthly Flows @ San Onofre Creek Based Upon SBCWA San Jose Creek Flow Model

Estimated monthly STREAM FLOW at San Onofre Creek, Vaqueros Formation:

San Jose multiplier = .13624

Formation exposure length (feet) = 600; Channel Geometry = Ellwood Creek

WtrYear	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Totals
1940-41	0	0	52	159	255	306	201	22	11	7	5	4	1022
1941-42	3	4	31	11	4	6	34	7	2	1	0	1	104
1942-43	2	3	3	246	49	76	13	6	2	2	1	1	404
1943-44	2	2	8	3	71	43	6	6	2	1	1	1	146
1944-45	2	30	4	4	56	15	6	3	1	1	0	0	121
1945-46	0	1	29	2	4	24	5	3	0	0	0	0	69
1946-47	0	41	30	1	1	3	1	1	0	0	0	0	79
1947-48	0	0	0	0	0	3	2	0	0	0	0	0	4
1948-49	0	0	2	1	1	24	1	9	1	0	0	0	38
1949-50	0	2	6	7	16	3	2	1	0	0	0	0	37
1950-51	0	1	1	2	1	2	1	1	0	0	0	0	9
1951-52	0	0	13	298	8	125	20	8	3	1	3	2	483
1952-53	3	10	33	21	3	4	4	4	2	0	0	1	84
1953-54	0	3	3	20	10	13	6	5	1	0	0	0	62
1954-55	0	2	7	16	6	5	8	11	2	0	0	0	58
1955-56	0	1	99	128	18	7	21	23	3	1	1	0	303
1956-57	0	0	1	22	36	12	19	14	2	1	0	0	107
1957-58	1	2	44	31	167	158	235	12	4	3	2	1	659
1958-59	1	1	2	15	37	4	2	2	2	1	0	0	65
1959-60	0	0	1	8	10	5	8	2	0	0	0	0	35
1960-61	0	11	4	6	2	2	1	0	1	1	1	0	28
1961-62	0	3	8	5	404	25	5	3	2	1	1	0	458
1962-63	2	2	2	3	35	12	10	5	4	1	1	1	77
1963-64	1	10	3	7	3	4	9	2	1	1	0	0	42
1964-65	1	4	30	11	2	6	79	4	3	1	1	1	143
1965-66	1	172	114	27	11	5	3	2	1	1	1	0	337
1966-67	1	11	196	192	25	32	72	15	5	2	3	2	556
1967-68	2	7	6	4	4	17	11	2	1	1	0	0	54
1968-69	1	2	3	273	203	65	42	12	10	3	3	3	620
1969-70	2	5	4	13	33	60	3	1	2	1	0	0	125
1970-71	1	16	21	8	4	5	3	4	3	1	0	0	66
1971-72	1	2	51	7	3	2	1	1	1	0	0	0	71
1972-73	1	26	2	88	180	84	12	11	5	2	1	1	413
1973-74	1	4	7	62	5	26	8	3	3	2	1	1	123
1974-75	1	2	44	3	94	97	9	5	3	2	0	0	261
1975-76	1	1	2	1	32	14	3	3	1	0	0	4	63
1976-77	4	3	2	18	2	3	1	10	1	0	0	0	46
1977-78	0	0	20	205	213	312	62	17	7	4	5	10	855
1978-79	7	8	8	16	31	54	13	5	4	3	1	1	149
Average	1	10	23	50	52	43	24	6	2	1	1	1	215

Table 6 - Estimated Monthly Stream Seepage (Percolation) Based Upon SBCWA San Jose Creek Flow Model

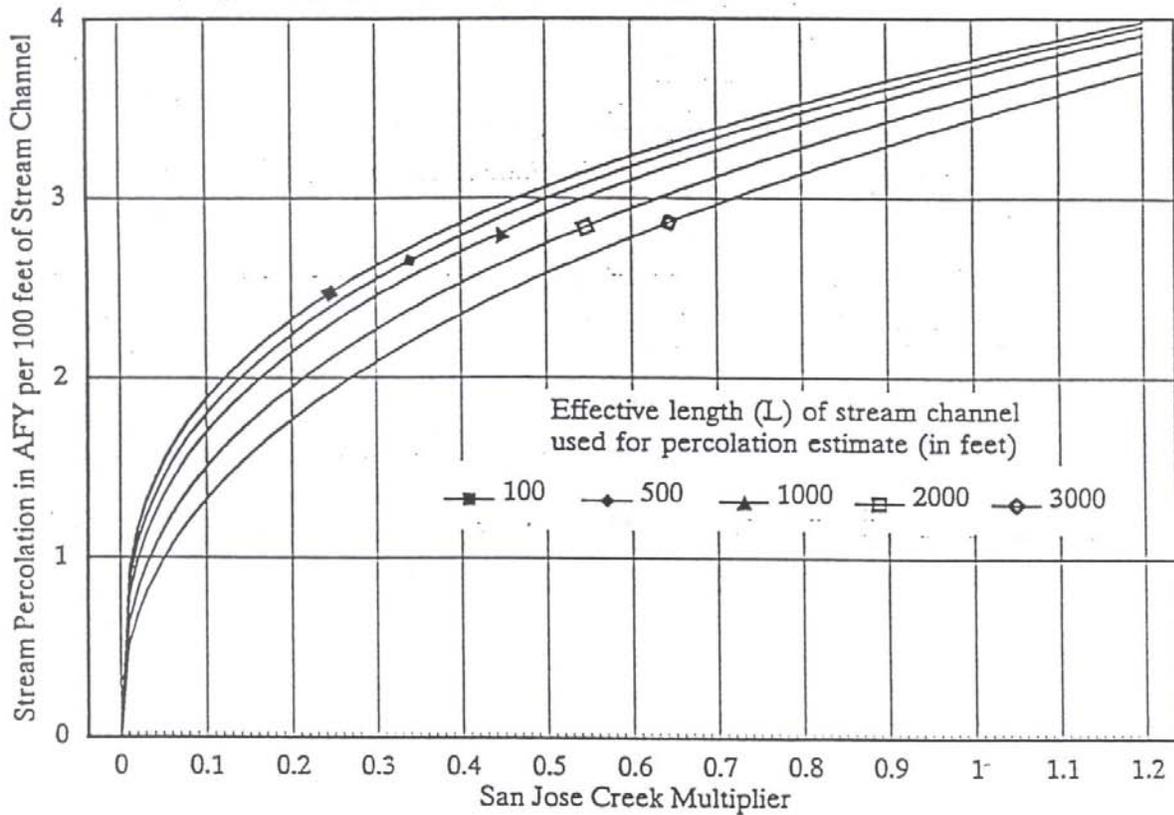
Estimated monthly STREAM PERCOLATION, San Onofre Creek Vaqueros Formation:

San Jose multiplier = .13624

Formation exposure length (feet) = 600; Channel Geometry = Ellwood Creek

WtrYear	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Totals
1940-41	0.0	0.0	1.1	2.7	3.5	3.9	3.4	2.0	1.6	1.4	1.2	1.1	22.0
1941-42	1.1	1.1	1.7	1.6	.9	1.1	1.9	1.4	.8	.7	.4	.7	13.3
1942-43	.7	1.0	1.1	2.3	2.0	2.7	1.7	1.3	.9	.9	.5	.6	15.6
1943-44	.9	.8	1.2	1.0	2.0	1.9	1.2	1.3	.9	.6	.5	.4	12.8
1944-45	.8	1.4	1.2	1.2	1.3	1.4	1.3	1.1	.4	.6	0.0	.1	10.9
1945-46	.1	.7	1.4	.8	.8	1.1	1.1	1.0	0.0	0.0	0.0	0.0	7.0
1946-47	0.0	1.2	1.5	.6	.4	1.0	.7	.7	0.0	0.0	0.0	0.0	6.1
1947-48	0.0	0.0	0.0	0.0	.1	.4	.6	0.0	0.0	0.0	0.0	0.0	1.1
1948-49	0.0	0.0	.3	.7	.4	1.3	.5	.7	.5	0.0	0.0	0.0	4.4
1949-50	0.0	.1	.8	1.1	1.1	1.1	.9	.4	.2	0.0	0.0	0.0	5.7
1950-51	0.0	.4	.8	.9	.7	.8	.3	.6	0.0	0.0	0.0	0.0	4.6
1951-52	0.0	0.0	.8	3.1	1.4	2.7	1.9	1.5	1.0	.5	1.1	.9	14.7
1952-53	1.0	1.4	1.9	1.8	.8	1.2	1.1	1.1	.8	.1	.3	.6	12.1
1953-54	.1	.9	1.1	1.1	1.0	1.2	1.3	1.3	.3	.1	0.0	0.0	8.5
1954-55	0.0	.8	1.3	1.4	1.1	1.2	1.1	1.5	.7	.1	0.0	0.0	9.3
1955-56	0.0	.7	1.9	2.1	1.7	1.4	1.8	1.8	1.0	.8	.6	.2	14.1
1956-57	0.0	.3	.6	1.5	1.4	1.3	1.4	1.6	.7	.5	0.0	0.0	9.4
1957-58	.4	.9	1.4	1.5	2.8	3.2	3.3	1.6	1.1	1.1	.9	.7	18.8
1958-59	.7	.7	.8	1.4	1.8	1.1	.9	.8	.8	.5	0.0	.3	9.8
1959-60	.2	.4	.6	1.3	1.3	1.2	1.0	.9	.2	.1	.2	.1	7.5
1960-61	0.0	1.3	1.1	1.2	.8	.8	.5	.4	.5	.5	.4	0.0	7.4
1961-62	.1	.7	1.2	1.1	3.5	2.1	1.3	1.0	.9	.7	.6	.3	13.7
1962-63	.9	.8	.8	1.0	1.5	1.5	1.4	1.3	1.1	.8	.7	.6	12.4
1963-64	.8	1.2	1.1	1.2	1.0	1.1	1.2	.8	.7	.6	.1	0.0	9.8
1964-65	.6	1.0	1.5	1.5	.9	1.1	2.3	1.1	1.0	.7	.6	.6	12.9
1965-66	.4	2.1	1.9	1.9	1.5	1.2	1.1	1.0	.7	.6	.6	.4	13.5
1966-67	.7	1.1	2.5	2.4	1.9	2.0	2.8	1.7	1.2	.9	1.0	.9	19.2
1967-68	.9	1.2	1.3	1.1	1.0	1.5	1.5	.9	.7	.5	.2	.3	11.1
1968-69	.7	.9	1.1	2.8	3.2	2.7	2.2	1.7	1.5	1.1	1.0	1.0	19.9
1969-70	.8	1.2	1.2	1.6	1.7	1.9	1.0	.8	.9	.6	.2	.3	12.1
1970-71	.5	1.0	1.5	1.4	1.1	1.2	1.0	1.2	1.0	.6	.3	.2	10.9
1971-72	.6	.9	1.8	1.4	1.0	1.0	.7	.7	.6	.2	.2	.3	9.2
1972-73	.6	1.4	1.0	2.0	3.0	2.9	1.6	1.6	1.2	1.0	.7	.8	17.7
1973-74	.4	.8	1.0	2.1	1.2	2.0	1.4	1.0	1.1	.9	.7	.7	13.4
1974-75	.5	.8	1.5	1.1	2.3	2.4	1.4	1.3	1.0	.9	.3	.1	13.6
1975-76	.5	.7	.9	.8	1.4	1.5	1.0	1.0	.5	.2	.2	.8	9.6
1976-77	1.1	1.0	.9	1.4	.8	1.1	.7	1.2	.7	.3	.1	.1	9.5
1977-78	0.0	.1	.5	2.8	3.1	3.8	2.6	1.9	1.4	1.2	1.3	1.6	20.3
1978-79	1.4	1.4	1.5	1.7	1.9	2.1	1.6	1.3	1.1	1.0	.8	.4	16.2
Average	.5	.8	1.2	1.5	1.5	1.7	1.4	1.1	.8	.5	.4	.4	11.80

STREAM SEEPAGE CURVES



Curve Formulas

Symbols: Y = Average stream percolation per 100 feet of stream channel.
 X = San Jose Creek Multiplier
 L = Effective length of stream channel

$$Y = A(X^B)$$

$$A = aL^2 + bL + c \quad (a = -6.27 \times 10^{-9}; b = -9.54131 \times 10^{-5}; c = 3.7822)$$

$$B = aL + b \quad (a = 3.896525 \times 10^{-5}; b = .296611)$$

Figure 2 - Stream seepage curves based on the San Jose Creek flow model.

(5) **Summary and Discussion.** The safe yield value assigned to a consolidated rock aquifer will be the sum of the estimated field recharge and potential stream seepage as calculated by the above methods. An alternative to the above "inventory" analysis is the Pumpage versus Change-in-Storage method. This method involves observing change in the amount of water stored in an aquifer over a long-term base period representing average hydrologic conditions. The change in storage is compared to the amount pumped and the difference is attributed to recharge. If sufficient site-specific, long-term water level and pumpage data is available for the aquifer under study (as determined by the Planning and Development Department geologist) the Pumpage versus the Change-in-Storage method will be used. Desired data for a Pumpage versus Change-in-Storage analysis would include detailed records of pumpage volumes and water levels at several points in the watershed for a period of at least ten years. This data is rarely available. Meaningful information on yield can be obtained, however, with detailed records over a shorter period. Three years of such records could allow for analysis of one or more of the three elements of recharge (field recharge, stream seepage and underflow). As an example, three years of data during a drought may only provide information on subsurface underflow. The estimated underflow would be added to the field recharge and stream seepage values calculated by the standard methods to obtain a safe yield figure. Available information on recharge obtained from site-specific geologic or well data will be considered in all analyses.

3. **Well interference threshold.** The impact of a net increase in pumpage, either from an existing well or a new well is potentially significant if:
- a. The production rate of a pre-existing nearby well as presently constructed would drop as a result of interference (cone of depression) to a level which would not support the existing use on that parcel or would not support a planned use for which a discretionary or ministerial permit has been granted.
 - b. The proposed new pumpage would result in a substantial degradation of water quality such that an existing use on a nearby parcel or a planned use for which a discretionary or ministerial permit has been granted could no longer be supported.

This impact will be analyzed by the Planning and Development Department geologist during case review using standard hydrogeologic methods (e.g. Theis Equation).

4. Water demand estimations.
- a. **Introduction.** A proposed project's future water use can be estimated using either of two methods. The first involves water duty factors. These factors, listed in Table 7 are averages of water demand for particular categories of users based on historical records or land use surveys. The categories are defined by lot size, type of use, zoning, and rarely, soil type. A project with a proposed land use which falls within the listed categories will have its demand estimated by this method. A second method is to estimate the future water use of a project based on a summation of each specific indoor and outdoor use. This method is used if an appropriate water duty factor is not in Table 7 or can not be feasibly generated during project review. Table 8a lists estimated indoor uses per person per year. Table 8b present estimates of water demand for various outdoor and unusual uses. If specific use factors are used to estimate both the

interior and exterior demand of a project, the calculated demand must be increased by 10 percent to account for emergency and unusual uses. The factors are to be used without the 10 percent contingency if a portion of the project's demand is based on a water duty factor. For example, in the case of an unusual lot size, a standard water duty factor for a smaller lot can be used. An amount of demand calculated for the additional lot area with a specific use factor would be added to the duty factor for the smaller lot. Another example would be in estimating the proportion of interior use included in a water duty factor.

In some cases, the water demand of certain agricultural crops is needed in the analysis of the net increase in water demand due to a proposed project. Table 9 lists water duty factors published by the U.C. Cooperative Extension (Farm Advisor) in 1991 for various crops grown in Santa Barbara County.

- b. Demand calculations.** A project's net new consumptive use is the figure which is compared to the Threshold of Significance to determine level of impact on groundwater resources. This figure represents the gross demand (i.e. water duty factor demand) adjusted for return flows to the groundwater basin, loss of natural recharge due to construction of impervious surfaces, increased recharge due to irrigated area or recharge basins and historic use on the site. "Historic use" is defined as the demonstrated average water use on the project site during the most recent ten years, excluding years prior to availability of water to the site. Both high and low water use years would be counted in the average. A "Project Water Demand Worksheet" is included as Figure 3. This worksheet accounts for all of the adjustments listed above and is designed for use in all areas of the County. Each of the factors used are explained on the attached instructions.
- 3. Mitigation measures.** Measures that can be applied to projects in order to minimize withdrawals from a groundwater basin (i.e. conserve water resources) or reduce impacts in an overdrafted basin are listed below. These measures are modified from the *A Planners Guide to Conditions of Approval and Mitigation Measures* manual available from the Planning and Development Department.

 - a.** Outdoor water use shall be limited through the measures listed below.

[Planner: This is a menu; select only those conditions that apply. You may also use some of these measures as water conservation conditions without requiring a landscape and irrigation plan.]

 - (1) Landscaping shall be with native and/or *[planner specify]* drought tolerant species.
 - (2) Drip irrigation or other water saving irrigation shall be installed.
 - (3) Plant material shall be grouped by water needs.
 - (4) Turf shall constitute less than 20 percent of the total landscaped area.
 - (5) No turf shall be allowed on slopes of over four percent
 - (6) Extensive mulching (two inch minimum) shall be used in all landscaped areas to improve the water holding capacity of the soil by reducing evaporation and soil compaction.

- (7) Soil moisture sensing devices shall be installed to prevent unnecessary irrigation.
- (8) Permeable surfaces such as turf block or intermittent permeable surfaces such as french drains shall be used for all parking areas and driveways.
- (9) The applicant shall plumb each lot for a grey water system. Each dwelling shall contain a grey water system plumbed to front and rear yard irrigation systems.
- (10) The applicant shall contract with an agency that sells reclaimed water to provide water for all exterior landscaping. Non-reclaimed water shall not be used to water exterior landscape. Prior to _____ the applicant shall deliver the above contract to County Counsel for review and approval. The applicant shall renew the contract annually and send copies of the contract and all receipts for reclaimed water received to permit compliance staff. These documents shall be due on _ of every year commencing ____.
- (11) Separate landscape meters shall be installed.

Plan requirements: Prior to _____, a landscape and irrigation plan shall be submitted to P&D for review and approval. The applicant/owner shall enter into an agreement with the County to install required landscaping/irrigation and maintain required landscaping for the life of the project.

Timing: The applicant shall implement all aspects of the landscape and irrigation plan prior to occupancy clearance.

Monitoring: P&D shall conduct site visits to ensure installation prior to occupancy.

b. Indoor water use shall be limited through the following measures [*Planner: This is a menu; select only those conditions that apply*]:

- (1) All hot water lines shall be insulated.
- (2) Water pressure shall not exceed 50 pounds per square inch (psi). Water pressure greater than 50 pounds per square inch shall be reduced to 50 psi or less by means of a pressure-reducing valve.
- (3) Recirculating, point-of-use, or on-demand water heaters shall be installed.
- (4) Water efficient clothes washers and dishwashers shall be installed.
- (5) Self regenerating water softening shall be prohibited in all structures. [*Required in Laguna Sanitation District.*]
- (6) Lavatories and drinking fountains shall be equipped with self-closing valves. [*Commercial only*]
- (7) Pool(s) shall have electronic pool cover(s).

Plan Requirements: Prior to _____, indoor water-conserving measures shall be graphically depicted on building and/or grading plans, subject to P&D review and approval.

Timing: Indoor water-conserving measures shall be implemented prior to _____.

Monitoring: P&D shall inspect for all requirements prior to occupancy clearance.

- c. The existing facility shall be retrofitted with water conserving showerheads (2 gpm) and toilets (1.6 gallons per flush).

Timing: Prior to land use clearance the retrofitting shall be completed by the applicant.

- d. High water consumption businesses (defined by P&D), including: _____, shall be prohibited from operating on the subject property.

Plan Requirements and Timing: Prior to _____, the applicant shall record an covenant agreeing to the prohibition with P&D for County Counsel approval to be included as a note on building plans, on lease agreements and in CC&Rs.

Monitoring: P&D shall ensure no such businesses occupy building prior to issuing land use clearance

- e. Reclaimed water shall be used for all dust suppression activities during grading and construction.

Plan Requirements and Timing: This measure shall be filed as a note with the final map and included as a note on the grading plan. Prior to the commencement of earth movement, the applicant shall submit to P&D an agreement/contract with a company providing reclaimed water stating that reclaimed water shall be supplied to the project site during all ground disturbances when dust suppression is required. *[Planner: see RECLAIMED WATER section]*

Monitoring: P&D staff shall inspect activities in the field to ensure non-potable water is being used in water trucks.

- f. All new development shall provide for on-site recharge basin(s) or shall contribute fees to an area wide program to provide for a Specific Plan Area Recharge System *[planner specify]*. On-site recharge vs. contribution of the area wide system shall be based upon on-site recharge conditions and shall be determined by P&D. Basin(s) shall be maintained for the life of the project by a Homeowners' Association. Recharge systems shall be developed in conjunction with the FCD.

Plan Requirements: Installation and maintenance for two years shall be ensured through a performance security provided by the applicant.

Timing: Recharge basins shall be installed (landscaped and irrigated subject to P&D and FCD approval) prior to __.

Monitoring: Permit Compliance shall site inspect for installation and maintenance of landscape. FCD sign off is required on final grading plans, and Permit Compliance sign off is required to release security.

- g. Water wells used on-site shall be monitored by the use of a flow meter or by analysis of electric meter records and recorded semi-annually (May 15 - June 1 and November 15 - December 1). Static water level shall be recorded for each well at the same time as the water production is recorded. *[Planners: Use only for salt water intrusion or when requested by the County hydrologist/geologist.]*

Plan Requirements and Timing: Prior to __the applicant shall record an agreement subject to P&D and County Counsel approval which agrees to the above condition and describes any future mitigation necessary should water quality degrade. The applicant

shall maintain a record of meter readings and water levels, available to P&D upon request, for the life of the project.

Monitoring: P&D shall review reports and determine if future mitigation is necessary.

- h. A water quality test shall be completed by the applicant.

Plan Requirements: The applicant shall submit test to EHS and P&D for review and approval.

Timing: Test shall be completed and submitted and approved prior to well permit issuance.

- i. A pump test for the water well shall be completed by the applicant.

Plan Requirements: The applicant shall submit test to EHS and P&D for review and approval.

Timing: Test shall be completed and submitted and approved prior to well permit issuance.

- j. The owner shall complete a water quality analysis on a semiannual basis to avoid the possibility of salt water intrusion into groundwater. Pumping shall cease if the following conditions occur [*P&D specify*].

Plan Requirements: A copy of the report shall be furnished to EHS and to P&D semiannually.

Timing: Prior to _____, the first water quality analysis shall commence.

- k. All drilling effluent shall be collected in an earthen sump (approx. 300 s.f. area, 1.5 to two feet deep) and disposed of at a location acceptable to P&D and EHS.

Plan Requirements: Prior to _____, plans for the sump and disposal areas shall be submitted to P&D and EHS for review and approval. Sump and disposal areas shall be depicted on _____ plans.

Timing: Sump and disposal areas shall be constructed prior to _____.

- l. Water well shall be solely exploratory. Any development, except for the exploration and testing thereof, is NOT approved under this Coastal Development Permit.

- m. A water meter shall be installed for the non-exploratory well(s).

Timing: Prior to the use of the well for any non-exploratory purpose, the applicant shall install a water meter.

Monitoring: The applicant shall provide proof of meter installation to P&D.

- n. Water well use shall be used solely for parcel _____. Water use on a separate parcel shall require further review and a Special Use Permit and Coastal Development Permit.

- o. The well head including all accessory equipment, shall be screened from all viewsheds and neighboring properties within 45 days of well installation.

Plan Requirements: A landscape plan indicating same shall be submitted prior to issuance of land use clearance for P&D approval. [*Planner: use landscape bond condition*].

Timing: Landscape plan shall be implemented prior to _____.

Monitoring: P&D shall inspect site prior to _____.

- p. The applicant shall install a coastal water quality monitoring well and monitor water quality per measure #10 above.

Monitoring: P&D shall review the completion report of the well.

(to be included with reporting under measure 10. above)

Measures suggested to mitigate the potential of certain projects to degrade water quality include the following:

- q. Preparation of a fertilizer/pesticide application plan which minimizes deep percolation of chemical-laden water to be reviewed and approved by the Planning and Development Department and the Public Health Department, Environmental Health Services Division.
- r. Installation of subsurface percolation basins and traps which would allow for detection and removal of fertilizers, pesticides and other chemicals.
- s. Biannual or annual water quality analysis for the detection of organic or inorganic contaminants in production or monitoring wells.

REFERENCES

- Miller, G.A. and Rapp, J.R., 1968: Reconnaissance of the groundwater resources of the Ellwood-Gaviota area, Santa Barbara County, California; U.S.G.S. Open File Report, 50p.
- Crippen, J.R., 1965: Natural water loss and recoverable water in mountain basins of Southern California; U.S. Geological Survey Professional Paper 417-E.
- Gibbs, D.R. and Holland, P.R., 1990: County of Santa Barbara, Flood Control and Water Conservation District, Precipitation Data Report.

PROJECT WATER DEMAND WORKSHEET

(Page 1 of 4)

Environmental Thresholds and Guidelines Manual (1992 Edition)
 County of Santa Barbara
 Resource Management Department, Division of Environmental Review
 By Brian R. Baca, 4/92
 (File "threshl.wk3")

Project Name: _____

Case Number: _____

APH(s):	Parcel size (Ac)	Zone District
_____	_____	_____
_____	_____	_____
_____	_____	_____

Project Description: _____

 DEMAND CALCULATIONS (Refer to instructions on pages 3 and 4)

	Water Duty Factor (AFY/Unit)	# Units	Gross Demand	Consum. Use Fac.	Net Consum. Use (AFY)
Residential					
Combined	_____	_____	_____	_____	_____
Interior	_____	_____	_____	_____	_____
Exterior	_____	_____	_____	_____	_____
Irrigation (Refers to potential agricultural activities on large lots in addition to residential demand associated with the homesites)					
AFY/parcel	_____	_____	_____	_____	_____
AFY/acre	_____	_____	_____	_____	_____
Commercial					
Combined	_____	_____	_____	_____	_____
Interior	_____	_____	_____	_____	_____
Exterior	_____	_____	_____	_____	_____
			Total demand	=	_____ AFY

PROJECT WATER DEMAND WORKSHEET

(Page 2 of 4)

RECHARGE ADJUSTMENTS

* These adjustments are made only for projects which are located north of the Santa Ynez Mountains (i.e. the North County). This is because most of the basin area on the South Coast is in confined conditions. Note that there is not universal agreement as to the location and size of the recharge area of each basin. All projects will be treated as if overlying a confined basin. Any recharge credit which might be due an individual project located in an identified recharge area of a South Coast basin is considered accounted for in the increase of the Threshold of Significance from previous manuals.

Credits (Instructions on page 4)

Field recharge increase

$$\left(\frac{\text{Irrigated infiltration rate (AFY/acre)}}{\text{Non-Irrigated Infil. rate (AFY/acre)}} \right) * \frac{\text{New Irrigated Area (Ac.)}}{\text{Recharge basin}} = \text{_____}$$

Recharge basin

$$\frac{\text{Rainfall Feet/year}}{\text{Acres Impervious Surfaces}} * \text{System Eff.} = \text{_____}$$

Debits

Loss of natural recharge

$$\frac{\text{_____ acres impervious surfaces}}{\text{_____ AFY/acre infiltration rate}} = \text{(_____)}$$

$$\text{Total adjustments} = \text{_____ AFY}$$

HISTORIC USE CREDIT

$$\frac{\text{Water demand of historic land use which will be discontinued due to proposed project}}{\text{Consum. Use Fac.}} = \frac{\text{Historic Use}}{\text{AFY}}$$

SUMMARY

$$\frac{\text{Total demand}}{\text{Recharge Adjustment}} - \frac{\text{Historic Use}}{\text{AFY}} = \frac{\text{Net new Consumptive Use}}{\text{AFY}}$$

Threshold of Significance

$$\frac{\text{Groundwater Basin}}{\text{T.O.S.}} = \text{AFY}$$

Notes: _____

Worksheet Instructions (calculation parameters)

Demand

1. Water Duty Factors: Included in the DER Thresholds manual (Table 3) for a variety of land uses. In some cases appropriate water duty factors may be generated by the DER geologist during case review. Note that the term "Units" can refer to parcels, dwelling units, 1000's of sq.ft. of building coverage or acres.
2. Number of Units: Only the residential units or other land uses which will be added as a result of the project are evaluated. Existing land uses which would continue after project approval are not included in project demand.
3. Gross demand: (Water Duty Factor * # of Units)
4. Consumptive Use Factor: This factor adjusts the gross water demand to account for return flows to the groundwater basin (A C.U. Factor of .6 equals 40 % return flows). Listed below are C.U. Factors to be used:

Basin	CUF	Explanation
Montecito	1.00	Gross water demand in the South Coast Basins is considered equal to consumptive use. This is because the recharge area is a small portion of the area of the basins (aquifers are confined) and interior effluent is ultimately conveyed to the ocean. (Wastewater reclamation is considered a new source of supply available to the purveyor.)
Foothill	1.00	
Goleta	1.00	
Santa Ynez	0.75	Average consumptive use factor estimated by RMD Registered Geologist and County Water Agency Senior Hydrologist.
Buellton	0.75	
Lompoc	0.75	
San Antonio	0.75	
Cuyama	0.75	
Santa Maria	0.75	

Exceptions:

0.60	Areas with sandy soils (Orcutt, Careaga or equivalent formation)
0.70	Orcutt area on the Orcutt Fm. (Clay layers impede infiltration)
0.75	Vandenberg Village (area of sandy soil but some of infiltrated landscape irrigation water discharges into creek and is consumed by riparian vegetation)
0.50	Wastewater disposed in the Santa Ynez River riparian basin.
*	Long-term pumpage offsets due to acceptance of treated wastewater will be counted as a direct return to the basin. (Must be demonstrated to the satisfaction of the DER Geologist)
1.00	Projects served by consolidated rock aquifers.

5. Net Consumptive Use: (Gross demand * C.U.Factor)
6. Residential Demand: Separate factors for interior and exterior use are only used when the consumptive use factors for each are different. Generally, interior use will be based on average occupancy figures from the most recent census (3.01 people/SFD) times the per person use for the type of plumbing fixtures involved. A 10 % contingency will be added to this figure.
7. Irrigation demand: Estimated by developing a water duty factor from similar land uses in the vicinity (AFY/parcel) or by an assessment of likely uses of the onsite soil types. This analysis can be performed by the applicant and reviewed for adequacy by the DER Geologist or may be prepared entirely by the DER Geologist.
8. Commercial Demand: Based on water duty factors (AFY/1000 sq.ft.) from the Thresholds Manual or as developed during case review.

PROJECT WATER DEMAND WORKSHEET

(Page 4 of 4)

Recharge Adjustments *

* These adjustments are made only for projects which are located north of the Santa Ynez Mountains (i.e. the North County). This is because most of the basin area on the South Coast is in confined conditions. Note that there is not universal agreement as to the location and size of of the recharge area of each basin. All projects will be treated as if overlying a confined basin. Any recharge credit which might be due an individual project located in an identified recharge area of a South Coast basin is considered accounted for in the increase of the Threshold of Significance from previous manuals.

- 9. Loss of Natural Recharge: The infiltration rate will be calculated by the DER Geologist using the Soil Moisture Balance method or Blaney Curve method. (See listing of infiltration rates in 10. below)
- 10. Field recharge increase: Irrigated and non-irrigated infiltration rates are calculated by the DER Geologist (listed below). Absent a detailed site plan, the proportion of impervious area and the percentage of the remaining area to be irrigated will be estimated as follows:

Lot size (sq.ft./unit)	% Impervious Area	% of yard area irrig.
7000 - 21780	35	75
21781 - 43560	30	60

Infiltration Rates (AFY/acre)

Area	Irrigated	Non- Irrigated	Analysis Method
Orcutt	.19	.05	Blaney
Buellton	.26	.09	Blaney
Santa Ynez	.30	.11	Blaney
Los Alamos	.25	.08	Blaney
Lompoc	.21	.07	Blaney

- 11. Recharge Basin: System efficiency is set at a maximum of .80 to account for system losses due to evaporation, leaks, loss of permeability of recharge basin over time and spills during peak flow events. A lower figure may be used if analysis by the DER Geologist, or other technical information, indicates that 80% efficiency cannot be achieved in the long term. Figure for annual average rainfall to be obtained from the Precipitation Data Report (Gibbs and Holland, 1990). To obtain this credit, the runoff from the impervious surfaces of the project must be conveyed to the recharge basin through impervious drains(not an unlined drainage channel).

Historic Use Credit

- 12. Historic use credit is only given for existing land uses that will be discontinued upon approval of the proposed project. (Examples: Removal of orchard for a new dwelling, elimination of landscaped area through enlargement of a structure, retrofitting a older onsite structure with low flow fixtures)
- 13. Consumptive Use Factor: Same as figure used for the demand calculation.

Summary

- 14. Total consumptive demand adjusted for recharge less discontinued historic use equals net new consumptive use. This figure is compared to the Threshold of Significance established for the groundwater basin to assign the impact level disclosed in the environmental document.

TABLE 7
1992 Groundwater Thresholds Manual - Water Duty Factors

Area	Land Use Designation	Minimum Acres or Sq.Ft./Unit	AFY/Unit	AFY/Acre	AFY/1000sf	Explanation
CARPINTERIA VALLEY	1 DU/3 acre	3.00	1.64	0.55		Data from the Carpinteria Water District, 7/88. (Refer to 88-EIR-12)
	1 DU/acre	1.00	0.86	0.86		
	1.8 DU/acre	24200.00	0.60	1.08		
	3.3 DU/acre	13200.00	0.40	1.32		
	4.6 DU/acre	9470.00	0.34	1.56		
	Condominiums		0.25			
	Apartments		0.20			
	Hobbit homes		0.16			
	Office/Retail			0.95		
	Hotel			8.70		
	Restaurant			4.50		
	Industrial			2.30		
	Schools			0.36		
	Parks, Irrigated Open Space			2.64		
MONTECITO	Greenhouses		3.00			Data from the Montecito Water District, 1989. (81-88 average water use)
	Open nurseries, field crops		1.00			
	1-E-1	43560.00	1.02	1.02		
	20-R-1	20000.00	0.68	1.40		
	3-E-1		1.70	0.56		
	7-R-1	3 acres	0.45	2.80		
	7-R-2	7000.00	0.26	3.18		
		3500.00				
SUMMERLAND	Less than 2500	0.20			Data from SCHO, (79-88 average water use)	
	2501-5000	0.21				
	5001-8500	0.27				
	8501-15000	0.30				
	15001-30000	0.40				
	30001-50000	0.71				
	50001-105000	1.10				
	Restaurant					
	Other					
	Public Schools Irrigation		1.40			
		1.10				

TABLE 7 (Cont'd)

Area	Land Use Designation	Minimum Acres or Sq.Ft./Unit	AFY/Unit	AFY/Acre	AFY/1000sf	Explanation
CITY OF SANTA BARBARA	SFD "Small"	Up to 9999 sf/lot	0.32			Data from City of Santa Barbara Water Demand Factor and Conservation Study "USER'S GUIDE" Document No. 2
	SFD "Medium"	10000-22000	0.51			
	SFD "Large"	22000-1 Acre	0.85			
	SFD "over 1 acre lot"	More than 1 Acre	1.44			
	Multi-Family Apartment		0.24			
	Auto Repair/Auto Body Shop					
	Bank					
	Church					
	Church w/School					
	Condominium		0.28			
	Convalescent Hospital					
	Gas Station					
	Gas Station/Mini Market					
	General Office					
	Grocery Store					
	Health Club					
	Hotel/Hotel					
	Hotel/Hotel/Restaurant					
	Industrial Assembly & Manufacturing					
	Industrial R&D					
	Medical Office					
	Mixed Medical/Dental					
	Multi-Family Apartment					
Restaurant, 24 hour						
Restaurant, Fast Food						
Restaurant, Sit Down						
Retail, Large-over 20,000 s.f.						
Retail, Small-under 20,000 s.f.						
Retirement Facility						
Senior Apartment						
School-Elementary						
School-Junior High						
Theater						
Warehouse/Industrial Storage						
Turf-grass						
Cool-Season						
Warm-Season						
Orchards						
Avocados						
Citrus						

TABLE 7 (Cont'd)

Area	Land Use Designation	Minimum Acres or Sq.ft./Unit	AFY/Unit	AFY/Acre	AFY/1000sf	Explanation	
GOLETA VALLEY	Retail (store)	1100-1200			0.13		
	Office	1700, 1800, 2400			0.15		
	Research Park HQ				0.14		
	Light Industry M-1***				0.28		
	Heavy Industry M-2****				0.10		
	Light/Heavy Industry M-1/M-2				0.23		
	Prof. Institutional P/1*****				0.14		
	Chrch. -7100(Assrs.UsrCd)				1.1/CHURCH		
	** Does not include parking lot and driveways						
	*** Includes engineer/construction/food/publishers						
	**** Includes auto repair/painting/trucking/builder's supply						
	*****Includes professional office/hospital/library/resrch. & dev.						
	SANTA YNEZ VALLEY	Residential					
		1 DU/10 acres	10.00	1.15	0.12		Data from SYRHCD, District #1
		1 DU/5 acres	5.00	0.98	0.20		1977
1 DU/1-4 acres		1-4	0.82	.82-.205			
1 DU/10000-20000 ft2		10000-20000	0.52	2.27-1.13			
1 DU/2180-7000 ft2		2180-7000	0.14	2.79-.87			
Commercial							
Industrial				1.64			
Institutional				0.62			
Agricultural				3.30			
Buellton Area	8-R-1	8000	0.57	3.10		Data from the Buellton Community Services District. (1982-91 average use)	
	7-R-1	7000	0.57	3.50			
LOMPOC VALLEY	Residential						
	1 DU/1-3 acres	1-3	.62	0.31		Data from City of Lompoc, 1977 ; Park Water, 1972	
	1 DU/20,000-1 ac.	1 ac.-20000 ft.2	.52-.62	1.28			
	1 DU/10,000-19,999	10,000-19,999	.30-.52	1.19			
	1 DU/3500-7000	3,500-7,000	.20-.30	2.07			

TABLE 7 (Cont'd)

Area	Land Use Designation	Minimum Acres or Sq.Ft./Unit	AFY/Unit	AFY/Acre	AFY/1000sf	Explanation		
LOHPOC VALLEY	Commercial			2.46				
	Industrial			0.98				
	Public Facility			0.33				
Mesa Oaks Area	1 DU/12500	12500	0.82			Data from the Mission Hills CSD. (1982-90 water use records)		
	DR-1.8	15000	0.87					
	1 DU/25000 ft.2	25000	1.00					
LOS ALAMOS VALLEY	Ag. (Non-prime soil; Irrigation demand)	100-150 ac.	25.00	.25-.17		Figure based on land use survey by DER, 1989. Data from the LACSD 1991 and modified from other sources. Refer to the Los Alamos Community Plan EIR.		
	RR-5	5 ac.	0.98	0.20				
	3-E-1	3 ac.	0.91	0.30				
	1-E-1	1 ac.	0.84	0.84				
	DR-1.8	24,200	0.73	1.31				
	10-R-1	10,000	0.62	2.70				
	7-R-1	7,000	0.57	3.55				
	DR-8	5,445	0.57	2.40				
	DR-12.3	3,540	0.26	3.20				
	PRO	15,000	0.67					
	Commercial (H-1)				0.28			
	Commercial (C1, C-2, C-3)				0.30			
	ORCUTT AREA	Residential						Data from So Cal. Water Co., 1977.
		4 DU/acre		0.41	1.64			
5-8 DU/acre			0.33	1.65 - 2.64				
9-12 DU/acre			0.25	2.25 - 3.00				
13-22 DU/acre (Includes trailers)			1.64	2.13 - 3.61	10,890			
Commercial			2.05					
Industrial		3.20						

TABLE 7 (Cont'd)

Area	Land Use Designation	Minimum Acres or Sq.Ft./Unit	AFY/Unit	AFY/Acre	AFY/1000sf	Explanation
ORCUTT (1992 Update)	10-R-1	10000.00	0.86			Data from Cal. Cities Water Co., 1-90 to 2-92 use records.
	20-R-1	13400.00 20000.00 40000.00	0.94 1.08 1.40			
CITY OF SANTA MARIA	Residential					Data from the City of Santa Maria, 1982-83 records.
	Single family	3.4 pers./unit		@ 133 gcpd		
	Condominium	2.0 pers./unit		@ 117 gcpd		
	Less than 4 rooms/unit	1.7 pers./unit		@ 117 gcpd		
	4 or more rooms/unit	2.5 pers./unit		@ 117 gcpd		
	Apartment	2.1 pers./unit		@ 87 gcpd		
	Mobile home	2.5 pers./unit		@ 125 gcpd		
	H.H. without children	2.0 pers./unit		@ 125 gcpd		
	Commercial			0.06		
	Industrial			0.08		

Table 8a - Water Demand Estimations Based on Individual Indoor Uses For Santa Barbara County Including Limitations of Ordinance 2948 (Applies to all areas of Santa Barbara County)

Indoor Use Per Person	gal/yr. w/5.5 gal. Toilet* 3.9 gpm shwr.	gal/yr. w/3.5 gal. Toilet* 3 gpm shwr	gal/yr. w/1.6 gal. toilet* 2 gpm shwr
Toilet 4 flushes/day - gallons/flush 5.5/3.5/1.6	8030	5110	2336
Shower .7/day - 3.9 gal/3 gal/2 gpm x 10 min.	9965	7665	5110
Tub bath .2/day tub 1/2 full = 24 gallons	1752	1752	1752
Brush teeth 1.3/day x 2.5 gal	1186	1186	1186
Shaving 1/day 25% of pop. X 4.5 gal.	411	411	411
Washing hands 5/day wet and rinse @ .2 gal/wash	365	365	365
Drinking and cooking x 1 gallon/day	365	365	365
Clothes washing .29 x 35 gallons/wash	3704	3704	3704
Dishwashing (calc. 1 person assume 2 person/household) auto wash .5 wash/day x 18 gallons inc. rinse	3285	3285	3285
Garbage disposal (calc. one person assume 2 person/ house .5 use/day x 1 gallon	183	183	183
Gallons/Year/Person	29,246	24,026	18,697
AFY/person	.0898 AFY	.0737 AFY	.0574 AFY

* Pre-ordinance toilets have mostly 5.5 gal tanks, Larry Farwell GWD 4/15/88 and Pre-ordinance standard pipe output (showers and faucets) was 3.9 gpm Ed Justus, Co., Bldg. Dept. 4/15/88.

** Further reductions in these indoor uses can be achieved through the installation of higher efficiency plumbing fixtures, for example, changing a 3.5 gallon flush toilet to a 1.6 gallon flush toilet.

Table 8b - Outdoor Use Per Unit (Applies county wide but some areas have a higher landscaping use).

Sauna/swimming pool	.1 AFY
Sauna/swimming pool with evaporation inhibitor	.05 AFY
Washing cars - soap and rinse with running water	15 gals/wash
Washing cars - 3 gallon bucket and brief rinse	105 gals/wash
Washing driveways	25 gals/wash
Green lawns, ornamental gardens	1.5-2 AFY/acre
Not so green lawns, ornamental gardens	1-1.5 AFY/acre
Drought resistant trees and shrubs and ivy	1 AFY/acre
Household gardens - beans, tomatoes, carrots, strawberries	1-4 AFY/acre
Commercial type orchards - avocados, lemons, walnuts	
New plantings 1-3 years	1.5-2 AFY/acre
Mature trees by flooding	1.5 AFY/acre
Mature trees by drip system	1.2 AFY/acre
Dust control/rider safety in horse arenas	1.2 AFY/acre
<u>Unusual Water Uses (per unit)</u>	
Pets - drinking - 1 gal/day bathing - .33 gal/day	1.33 gal/day
Water beds	100 gal/year
Dark room	20 gal/use
Washing floors and household cleaning	10 gal/week
Aquaria	1 gal/week 5 gal/day

If individual use factors (from Table 8) are applied by themselves, a contingency factor of 10 percent of the total indoor/outdoor use calculated should be added for darkrooms, , mopping floors, leaks in the water pipes, hoses left running accidentally, washing down the house or a boat, other occasional uses or future conversion of landscaping to higher water use plants.

**Table E 9 - Agricultural Water Duty Factors in Santa Barbara County.
Compiled by Cooperative Extension, University of California, Santa Barbara County (9-16-91)**

Irrigation Water Use by Crops in Santa Barbara County (AFY/acre)

Crop	South Coast Area		Santa Maria & Lompoc Valleys		Santa Ynez, Los Alamos & Sisquoc Valleys		Cuyama Valley	
	Range	Avg	Range	Avg	Range	Avg	Range	Avg
<u>Field crops</u>								
Beans			.5-1.3	1.0	.9-1.5	1.3	1.0-1.7	1.5
Corn, field			1.5-2.2	1.8	2.0-2.8	2.2	2.4-3.2	2.8
Grain, irrigated			.3-.7	0.5	.6-1.0	.8	1.0-1.8	1.5
Sugar beets			2.6-3.2	3.0	3.0-3.6	3.2	3.6-4.6	4.0
<u>Forages & Pastures</u>								
Alfalfa			2.6-3.3	3.0	3.0-4.0	3.5	4.0-4.6	4.3
Pasture/irrigated			2.8-3.3	3.0	3.3-4.0	3.7	4.0-4.6	4.3
Sudangrass			1.0-1.8	1.5	1.3-2.0	1.7	2.0-3.0	2.5
<u>Ornamentals</u>								
Cut flowers/field	1.5-2.3	1.8	1.5-2.3	1.8				
Flower seeds			1.5-3.0	2.3	2.0-3.5	2.7		
Greenhouse:								
Carnations	2.0-3.0	2.5						
Mums, pompom	2.0-4.5	4.0						
Mums, potted	4.5-5.5	5.5						
Turfgrass	2.5-2.8	2.7	2.5-2.8	2.7	3.0-4.0	3.5	3.5-4.5	4.0
<u>Trees and Vines</u>								
Avocados	1.0-2.0	1.6	1.1-2.1	1.7				
Deciduous fruits			1.2-2.0	1.7	1.5-3.0	2.5	3.0-4.5	3.8
Grapes			.7-1.8	1.2	1.0-3.0	2.0		
Lemons	.8-1.8	1.5	1.0-2.0	1.6				
Walnuts	1.0-2.0	1.5	1.3-2.5	1.8	2.0-3.5	3.3		
<u>Vegetables</u>								
Broccoli/cabbage			1.3-1.5	1.4*	1.5-2.0	1.7		
Cauliflower			1.5-2.0	1.7*	2.0-3.0	2.5		
Carrots			1.5-3.0	2.3	2.0-2.5	2.2	2.5-3.5	3.0
Celery			2.0-2.5	2.2*	2.0-2.5	2.2		
Lettuce			1.0-1.3	1.1*	1.0-2.0	1.5		
Potatoes			1.5-2.0	1.7	2.0-3.0	2.5		
Strawberries	2.5-3.5	3.0	2.5-3.0	2.7				
Tomatoes	1.0-2.0	1.5	1.5-2.0	1.7				

*Average two crops per year in Santa Maria Valley (multiply factor shown by 2 to obtain AFY/acre)

12. NOISE THRESHOLDS (Approved by the Board of Supervisors, August 1993)

A. Noise: Properties and Measurement.

Noise is defined as unwanted or objectionable sound. Sound is a form of energy detectable by the human hearing system, and it is commonly produced when some object is set into vibration. The vibration is transmitted to any surrounding media, such as air, causing pressure variations or "sound waves" among the air particles. These waves spread outward from the source, and along their path the waves can reflect off surfaces, they can bend around obstacles, and they can be absorbed by insulative materials. If sound waves reach one's ears, the membranes at the end of the ear canal begin vibrating. The vibration is transmitted by small bones in the middle ear to the cochlea, where the inner ear's sensory organ is located. Nerve impulses originating in the cochlea are interpreted by the brain as "sound."

Measurement of sound involves determining three variables: (1) magnitude; (2) frequency; and (3) duration.

- 1. Magnitude.** The magnitude of variations in air pressure associated with sound wave results in the quality commonly referred to as "loudness". Human ears respond to a very wide range of sound pressures, producing numbers of awkward size when sound pressures are related on an arithmetic (1, 2, 3, ...) scale. It has therefore become customary to express sound magnitude in decibels (dB) which are logarithmic (1, 10, 100 ...) ratios comparing measured sound pressures to a reference pressure. The reference pressure commonly used in noise measurement is 20 micro-Pascals, which is considered to be the quietest sound normal ears can hear. This sound level is assigned the value zero dB, and each increment in sound level of 20dB represents a relative change in sound pressure of ten times. A three dB increase in sound level represents a doubling of sound energy, but it will not be experienced as a doubling of loudness. Loudness refers to how people judge the volume of sound. As a rule of thumb, a one dB change in sound level requires close attention to notice a change in loudness; a three dB change is clearly noticeable; and a 10 dB change will be nearly twice (or one-half) as loud. A noise of 70 dB sound is about twice as loud as 60 dB and four times as loud as 50 dB. The 50 dB noise will be twice as loud as 40 dB, and so on. Figure 1 illustrates the relationships among sound level, relative sound pressure, and relative loudness.

Sound level diminishes as distance from the source increases. For a point source of sound in free space, the rate at which the sound attenuates is inversely proportional to the square of distance from the source. This means the sound level will drop six dB each time the distance from the source is doubled. A stream of vehicles on a busy highway represents a "line" source of sound and the rate of attenuation is different from a point source. The sound level from a busy highway will drop only about three dB for each doubling of distance. Sound attenuation from a train resembles a line source near the railroad tracks and at further distances (beyond about 0.3 the length of the train) can be considered a point source.

Because decibels are logarithmic ratios, they cannot be manipulated in the same way as arithmetic numbers. Addition of decibels produces such results as $70\text{ dB} + 70\text{ dB} = 73\text{ dB}$. Thus, if a single automobile produces a sound level of 73 dB, two such automobiles would produce a total sound level of 73 dB. Twice as much acoustic energy is being generated, and this is represented in decibels as a three dB change. As a second example of decibel addition,

if one automobile produces a sound level of 70 dB and the other 60 dB, the combined sound level will be 70.4 dB. When the difference between two sound levels is greater than about 10 decibels, the lesser sound is negligible in terms of affecting the total level.

Air and ground absorption of sound waves will further attenuate sound levels. The rate at which these factors attenuate sound depends on frequency content of the sound, air temperature, relative humidity, terrain, and type of ground cover.

- 2. Frequency.** A second characteristic of sound which must be included in the measurement is frequency. Typical community sounds consist of a wide range of frequencies, from the low roar of a diesel engine to the high-pitched whine of jet aircraft. Frequency refers to the number of times per second the object producing the sound vibrates, or oscillates. The unit of measurement of frequency is Hertz - one vibration per second being equal to one Hertz (Hz).

The human ear responds to sounds whose frequencies are in the range from 20 Hz to 20,000 Hz. Frequencies above or below this range are inaudible to humans and are referred to as ultrasound and infrasound, respectively. Within the audible range, subjective response to noise varies. People generally find higher pitched sound to be more annoying than lower pitched sounds. Sensitivity of the ear also varies. While "loudness" depends primarily on sound pressure, it is also affected by frequency; and while "pitch" is closely related to frequency, it also depends on sound pressure. Thus, a 2,000 Hz tone at 5 dB sound pressure level sounds just as loud as a 20 Hz tone at 70 dB sound pressure level; 20 Hz at 70 dB sound pressure level is quiet to the ear; 2,000 Hz at 70 dB sound pressure level is quite loud.

Because of these variations, a great deal of effort has gone into the development of systems which relate physical measurements of noise to subjective human response. Most of these depend on calculations based on sound pressure levels in various frequency bands "weighted" to correspond with human response. These procedures are cumbersome for most community noise assessment needs. Presently, the most widely used measure of "loudness" for community noise evaluation is the A-weighted sound level. The primary advantage of this descriptor is simplicity, and it has fair correlation with subjective assessments of loudness and annoyance. Sound levels in this report are A-weighted and referred to as "dB(A)".

- 3. Duration.** The third characteristic of noise that must be accounted for to describe human noise response is duration. Noise-induced hearing loss, for example, is directly related to magnitude, frequency content, and duration of noise exposure. Annoyance due to noise is also associated with how often noise is present and how long noise persists.

Environmental noise at any location is usually fluctuating from quiet one moment to loud the next. To adequately describe a noise environment, it is necessary to quantify the variation in noise level over time. One way to do this is to use a statistical approach and specify noise levels that are observed to be exceeded a given percentage of time. Commonly used exceedance levels are:

L₉₀ - That level exceeded 90 percent of the time, sometimes referred to as the Residual Noise Level.

L₅₀ - That level exceeded 50 percent of the time, the median sound level.

L₁₀ - That level exceeded 10 percent of the time, representing higher level, shorter duration noise.

Another approach to quantifying time-varying noise levels is to calculate the Energy Equivalent Sound Level (L_{eq}) for the time period of interest. L_{eq} represents a sound level which, if continuous, would contain the same total acoustical energy as the actual time-varying noise which occurs during the observation period.

- a. **Time-weighted noise measures: CNEL, L_{DN} .** Noise in a residential, or other noise-sensitive setting, is often more bothersome at night than during daytime. At night, background noise levels outdoors are generally lower than during the day. Also, the activity in most households decreases at night, lowering internally generated noise levels. Individual noise events are therefore more intrusive at night, since they stand out against the background more sharply than during the daytime.

Community Noise Equivalent Level (CNEL) and Day-Night Average Level (L_{DN}) are noise indices that attempt to take into account differences in intrusiveness between daytime and nighttime noises. CNEL and L_{DN} values result from the averaging of hourly Energy-Equivalent Sound Levels for a 24-hour period, with a weighting factor applied to evening and night-time L_{eq} values.

For CNEL and L_{DN} calculations, the day is divided into time periods with the following weightings:

- (1) Community Noise Equivalent Level.

Daytime: 7 a.m. - 7 p.m. - weighting factor of 1

Evening: 7 p.m. - 10 p.m. - weighting factor of 5 dB

Nighttime: 10 p.m. - 7 a.m. - weighting factor of 10 dB

- (2) Day-Night Average Level.

Daytime: 7 a.m. - 10 p.m. - weighting factor of 1

Nighttime: 10 p.m. - 7 a.m. - weighting factor of 10 dB

CNEL and L_{DN} have been shown to have good correlation with group responses to long-term noise exposure. In practice, CNEL and L_{DN} are virtually identical. Experience with highway, railroad, airport, and general community noise in this County has shown that the two measures consistently agree with 1.0 dB. In this report they are used interchangeably.

- b. **Noise exposure contours.** Noise exposure contours are the mapped expressions of points of equal average noise level, analogous to topographic contours which are the mapped expression of points of equal elevation. Noise contours can be drawn with respect to any noise measure; to satisfy State requirements for the Noise Element, L_{DN} and CNEL have been used in this report. Noise contours usually refer to a single source of noise such as a freeway, although they sometimes combine multiple sources.

4. **Ambient noise.** Ambient noise refers to background noise. It is the composite of noise from all sources which impact a given location. It is the normally existing noise environment at a particular place. Ambient noise levels are measured as described in the previous sections, using weighted noise measurement systems.

Noise impacts associated with proposed projects may involve ambient noise in several ways. A project may involve a significant noise impact if it generates noise that creates a substantial increase in ambient noise levels affecting noise-sensitive uses in the project vicinity. A project may also have significant noise impacts if the project involves siting of a

noise-sensitive land use in a location with high ambient noise levels.

B. Noise Threshold Criteria.

1. **Controlling noise.** Significant noise impact problems in Santa Barbara County are primarily associated with transportation facilities. Noise in the vicinity of airports, railroads, and major traffic-ways exceeds health and welfare criteria for noise exposure in relation to residential use. While noise from commercial, industrial, agricultural, and "population" activities may be part of the ambient noise at any location, rarely do these generate noise of the same magnitude as transportation sources.

In the unincorporated County, it is estimated that as many as 8,000 housing units and 21,000 persons are potentially exposed to transportation noise at Day-Night Average Levels exceeding 60 dB. The exposure level of 60-65 dB(A) is considered to be the maximum outdoor noise level compatible with residential and other noise-sensitive land uses. In locations outside the immediate influence of a major transportation noise source, ambient Day-Night Average Levels typically range from 46 dB(A) to 57 dB(A). Although localized noise problems will exist in these areas, generally ambient noise levels are acceptable, based on health and welfare criteria.

Controlling the impact of transportation noise must be approached both by quieting vehicles and by protecting sensitive land uses in locations where noise impact is excessive. The first of these approaches is beyond the legal jurisdiction of the County because Federal and State legislation is preemptive in the field of noise source control. The County's primary opportunities to manage transportation noise impact lie in:

- a. Planning for compatible uses near existing transportation facilities.
 - b. Imposing design standards on proposed sensitive development near existing transportation facilities.
 - c. Incorporating noise control features into the design of new or expanded traffic-ways to protect existing sensitive areas.
2. **Planning policies.**
 - a. In the planning of land use, 65 dB(A) Day-Night Average Sound Level is regarded as the maximum exterior noise exposure compatible with noise-sensitive uses unless noise mitigation features are included in project designs.
 - b. Noise-sensitive land uses are considered to include:
 1. Residential, including single- and multi-family dwellings, mobile home parks, dormitories, and similar uses.
 2. Transient lodging, including hotels, motels, and similar uses.
 3. Hospitals, nursing homes, convalescent hospitals, and other facilities for long-term medical care.
 4. Public or primate educational facilities, libraries, churches, and places of public assembly.
 - c. Noise-sensitive uses proposed in areas where the Day-Night Average Sound Level is 65 dB(A) or more should be designed so that interior noise levels attributable to exterior sources do not exceed 45 dB(A) L_{DN} when doors and windows are closed. An

analysis of the noise insulation effectiveness of proposed construction should be required, showing that the building design and construction specifications are adequate to meet the prescribed interior noise standard.

- d. Residential uses proposed in areas where the Day-Night Average Sound Level is 65 dB(A) or more should be designed so that noise levels in exterior living spaces will be less than 65 dB(A) L_{DN} . An analysis of proposed projects should be required, indicating the feasibility of noise barriers, site design, building orientation, etc. to meet the prescribed exterior noise standard.
 - e. The Planning and Development Department, including the Building and Safety Division, and Public Health Department's Environmental Health Services Division have administrative procedures for determining project compliance with the State Noise Insulation Standards related to interior noise levels.
 - f. For protection of sensitive activities, as well as the airports, noise-sensitive land uses, other than hotels and motels insulated to the level prescribed in the State Noise Insulation Standards, should not be permitted within the 65 dB(A) CNEL contour of any airport.
 - g. Residential use should be avoided within the 65 dB(A) CNEL contour of any airport and under airport traffic patterns.
 - h. Zoning ordinance noise level provisions for the M-1 and M-2 zone districts require that noise generated by any use on the property shall not exceed 75 dB L_{10} at or beyond any point along the property boundary upon which such use is located. In no case shall the volume of sound exceed 65 dB L_{dn} at the location of any nearby noise sensitive uses. The M-RP zone district requires that the volume of sound generated or resulting from any use, other than motor vehicles, operated in any lot shall not exceed 50 decibels at any point along the boundary of or outside of the lot upon which such use is located. All of these requirements assume measurements are taken during calm air conditions.
 - i. In the planning and design of major transportation routes and facilities, noise impacts on existing or planned land uses are carefully considered so that noise-related land use conflicts are minimized.
 - j. The Goleta Community Plan (Policy N-GV-1) requires that interior noise-sensitive uses (e.g., residential and lodging facilities, educational facilities, public meeting places and others specified in the Noise Element) shall be protected to minimize significant noise impacts.
 - k. The Montecito Community Plan requires that noise-sensitive uses, as defined in the Noise Element, shall be protected from significant noise impacts.
 - l. The Summerland Community Plan requires that interior noise sensitive uses, noise-sensitive uses as defined in the Noise Element, shall be protected from significant noise impacts.
- 3. Noise thresholds.** The following are thresholds of significance for assisting in the determination of significant noise impacts. The thresholds are intended to be used with flexibility, as each project must be viewed in its specific circumstances.
- a. A proposed development that would generate noise levels in excess of 65 dB(A)

CNEL and could affect sensitive receptors would generally be presumed to have a significant impact.

- b. Outdoor living areas of noise sensitive uses that are subject to noise levels in excess of 65 dB(A) CNEL would generally be presumed to be significantly impacted by ambient noise. A significant impact would also generally occur where interior noise levels cannot be reduced to 45 dB(A) CNEL or less.
- c. A project will generally have a significant effect on the environment if it will increase substantially the ambient noise levels for noise-sensitive receptors adjoining areas. Per item a., this may generally be presumed when ambient noise levels affecting sensitive receptors are increased to 65 dB(A) CNEL or more. However, a significant effect may also occur when ambient noise levels affecting sensitive receptors increase substantially but remain less than 65 dB(A) CNEL, as determined on a case-by-case level.
- d. Noise from grading and construction activity proposed within 1,600 feet of sensitive receptors, including schools, residential development, commercial lodging facilities, hospitals or care facilities, would generally result in a potentially significant impact. According to EPA guidelines (see Figure 2) average construction noise is 95 dB(A) at a 50' distance from the source. A 6 dB drop occurs with a doubling of the distance from the source. Therefore, locations within 1,600 feet of the construction site would be affected by noise levels over 65 dB(A). To mitigate this impact, construction within 1,600 feet of sensitive receptors shall be limited to weekdays between the hours of 8 AM to 5 PM only. Noise attenuation barriers and muffling of grading equipment may also be required. Construction equipment generating noise levels above 95 dB(A) may require additional mitigation.

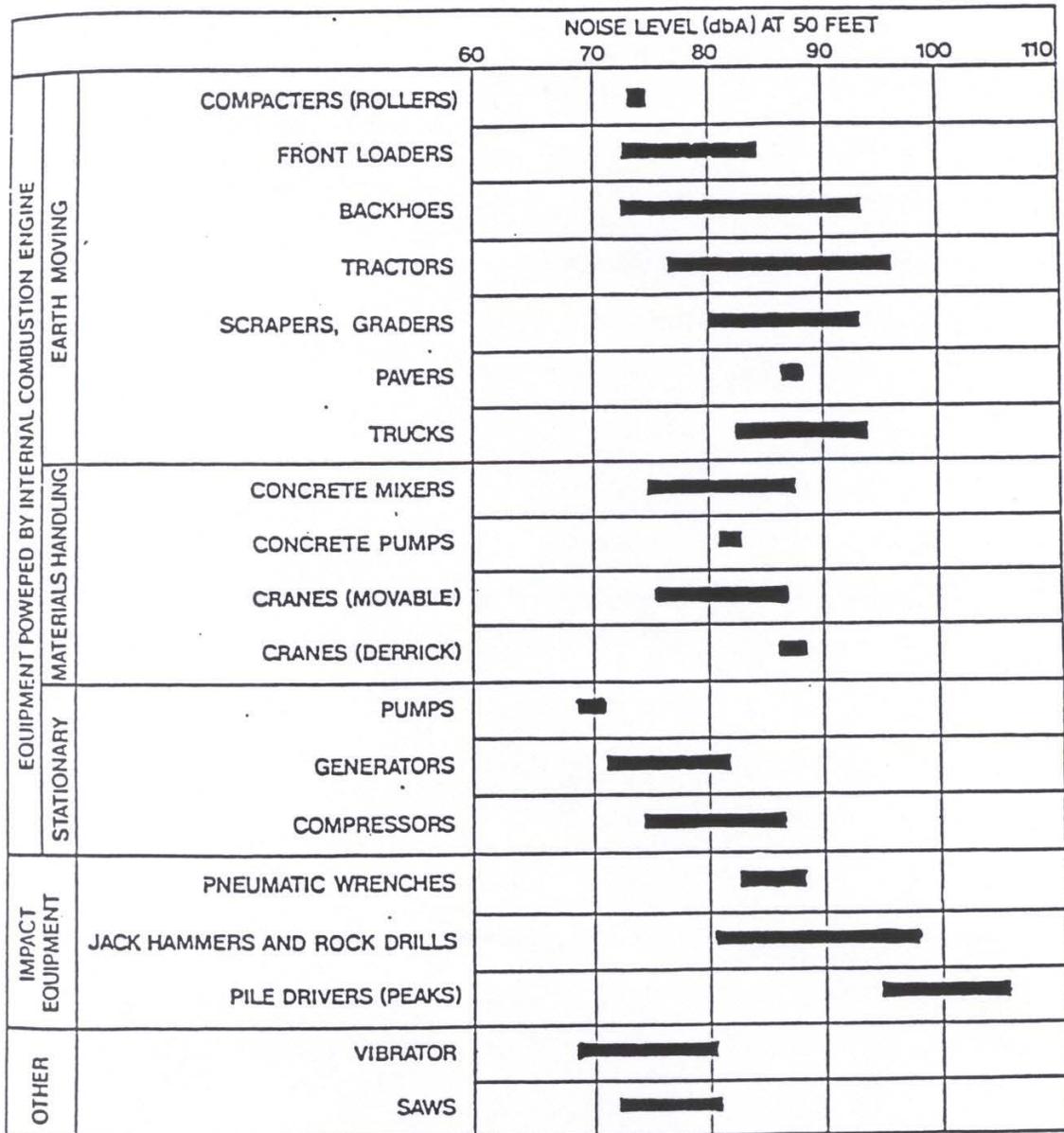
All noise studies evaluating ambient noise levels and changes resulting from project development should be prepared by licensed acoustical engineers.

Figure 1: Sound Level of Common Sounds

Sound	Sound Pressure Level	Relative Sound Pressure	Relative Loudness (approximate)
Jet Takeoff, 200 feet	120	1,000	64
Riveting Machine	110		32
Power Mower (at 5 feet)	100	100	16
Motorcycle (at 50 feet)	90		8
Inside Sports Car (50 mph)	80	10	4
Vacuum Cleaner	70	3	2
Ordinary Conversation (at 3 feet)	60	1	1
Private Business Office	50		1/2
Inside Average Residence	40	0.1	1/4
Soft Whisper (at 5 feet)	30		1/8
Inside Recording Studio	20	0.01	1/16
Rustle of leaves	10		1/32
Threshold of Hearing	0	0.001	1/64

FIGURE 2

Noise Levels for Typical Construction Equipment Referenced to 50 Feet



Note: Based on limited available data samples.

Source: EPA, 1971: "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances," NTID 300-1.

REFERENCES

1. U.S. Department of Transportation, Transportation Noise and Its Control (Washington, D.C. US GPO) 1972
2. U.S. Environmental Protection Agency, Public Health and Welfare Criteria For Noise (Washington, D.C. US GPO) 1973
3. U.S. Environmental Protection Agency, Information on Levels of Environmental Noise Requisite to Protect the Public Health and Welfare with an Adequate Margin of Safety (Washington, D.C. US GPO) 1974

13. QUALITY OF LIFE GUIDELINES

Quality of life can be broadly defined as the aggregate effect of all impacts on individuals, families, communities, and other social groupings and on the way in which those groups function. The quality of life subsumes what others label as the psychological, psychosocial, well-being, or satisfactional impacts. Quality of life has implications for mental health and well-being, social structure, and community well-being:

- Mental health and well-being encompasses changes in the mental states of individuals, including their attitudes, perceptions, and beliefs as well as the associated psychological and physiological consequences of those changes.
- Social structure encompasses changes in the social organization of families and groups, their collective postures over the impacts, and how impacts affect the cohesion and viability of the group.
- Community well-being encompasses changes in community structure that relate to non-economic factors, such as desirability, social cohesion, livability, attractiveness, and sense of place.

Quality of life issues, while hard to quantify, are often primary concerns to the community affected by a project. Examples of such issues include the following:

- Loss of privacy;
- Neighborhood incompatibility;
- Nuisance noise levels (not exceeding noise thresholds);
- Increased traffic in quiet neighborhoods (not exceeding traffic thresholds);
- Loss of sunlight/solar access.

The County interprets the CEQA mandate for maintaining a high quality environment strictly, and considers the maintenance of a high quality human environment an important responsibility. The State CEQA Guidelines clearly support the use of local standards in determining what constitutes a significant effect on the environment. Therefore, on a case by case basis, the elements comprising "quality of life" shall be considered. Where a substantial physical impact to the quality of the human environment is demonstrated, the project's effect on "quality of life" shall be considered significant.

14. PUBLIC SAFETY THRESHOLDS

A. Purpose.

The thresholds contained within this chapter assist the County in classifying the significance of impacts to public safety in a consistent and comprehensive manner when considering a discretionary land-use action. These thresholds focus on involuntary public exposure to acute risks that stem from certain types of activities with significant quantities of hazardous materials. Such activities include installations or modifications of facilities that handle hazardous materials (hereinafter referred to as hazardous facilities), and the transportation of hazardous materials. However, the thresholds also assist in identifying potentially significant impacts to non-hazardous land uses proposed in proximity to existing hazardous facilities.

The thresholds employ quantitative measures of societal risk during the environmental review of a proposed development to indicate whether the annual probability of expected fatalities or serious injuries is significant or not. Measuring societal risk must comply with County-approved guidelines; however, it is not necessary to complete a quantitative risk analysis in order to determine whether an environmental impact report is required or not during preparation of an initial study. Both unmitigated risk estimates and the effectiveness of options to mitigate significant risk should be tested against the threshold. If a proposed project exposes the public to significantly high risks despite all feasible measures to mitigate the impact, then approval of the project requires a statement of overriding considerations, adopted by the approving authority and supported by substantial evidence in the record. Upon project approval, the risk estimates should be adjusted and charted on the thresholds to reflect the risk accurately, based on accepted mitigation, for future land-use planning and permitting purposes.

As described below, these thresholds should not function as the sole determinants of significance for public safety impacts. Rather, they must be used in concert with applicable County policy, regulation, and guidelines to address other qualitative factors specific to the project which also help determine the significance of risk. For example, highly sensitive land uses (e.g., hospitals or schools) are generally given greater protection from hazardous situations overall. Also, long-term significant risks (e.g., natural gas production) generally are treated more conservatively than relatively short-term risks (e.g., natural gas exploration).

B. Definitions.

Acute risk - Chance of fatality or serious injury due to a single, short-term, involuntary exposure to a release of hazardous gas, liquid, or solid, or to a fire or explosion.

Fatality - Death, including exposure to an accident that produces escape-impairing symptoms and considering nearly all individuals that could be exposed (i.e., not just healthy workers, but the elderly, the young and individuals with preexisting health problems).

Feasible - Capable of being accomplished in a successful manner with a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.

Occupational Safety - Applies to employees and contractors (not including construction crews) of a hazardous facility (including people who visit the hazardous facility to provide services or conduct business).

Qualitative Factors - Consideration of special characteristics of risk not generally included in its quantification but being sufficiently important to influence the identification and analysis of significant public safety effects, directly or indirectly.

Quantitative Factors - Use of relevant empirical data, in raw form or modified as necessary by expert judgment, and employed in scientifically or technically accepted methodologies, to predict the probability and consequences of an accident with regard to a potentially vulnerable individual or group of people.

Safety - A judgment of the acceptability of risk, recognizing that there is always some chance of an accident that may adversely affect someone, no matter what precautionary steps are taken to prevent the accident or protect against its consequences.

Serious Injury - Physical harm to a person that requires significant medical intervention.

Societal Risk - Risk to a group of people, expressed in terms of the distributed frequency of events that cause multiple casualties or, when appropriate, the likelihood of casualties at a specific location or area.

C. Applicability.

These thresholds apply to risks stemming from the following facilities and activities if (a) they are subject to a discretionary land-use action (or would communicate its concerns for public safety to another jurisdiction that is making a discretionary decision such as routes for shipping hazardous materials), and (b) initial analysis reveals substantial evidence to support a fair argument that the potential of a significant impact to public safety could result from approval of the project subject to such action.

1. Oil wells and gas wells (unless abandoned or undergoing abandonment), and associated production.
2. Gas and hazardous liquids pipelines, including oil if a significant risk is expected, but exempting existing natural gas pipelines owned by a Californian public utility regulated by the California Public Utilities Commission and operated for the purpose of delivering gas directly to the Goleta storage field or consumers (except activities related to liquefied natural gas), and exempting new low pressure distribution pipelines (125 psig or lower) operated by a Californian public utility and regulated by the California Public Utilities Commission.
3. Oil and/or gas processing and storage facilities, including facilities for removing sulfur, removing gas liquids, and compressing gas.
4. Oil refineries.
5. Handling, storage, and transport of compressed natural gas or methanol related to facilities for refueling motor vehicles with these materials.
6. All handling, storage, and transport of chlorine in containers with a capacity of one ton or more, or an equivalent amount of chlorine in bottles or cylinders connected through a common header.
7. Handling, storage, and transport of anhydrous ammonia in containers with a capacity of one ton or more, or an equivalent amount of anhydrous ammonia in bottles or cylinders connected through a common header.
8. Handling, storage, and transport of acutely hazardous rocket propellants such as nitrogen tetroxide (including instances where the County would communicate with other jurisdictions about discretionary actions that affect public safety in this County such as designation of routes for transporting hazardous materials).

9. Handling, storage, and transport of spent radioactive fuel and other high-level, radioactive materials (including instances where the County would communicate with other jurisdictions about discretionary actions that affect public safety in this County such as the designation of route for transporting hazardous materials).
10. Storage of natural gas liquids, including liquefied petroleum gas, unless such storage is limited to a single container with a maximum capacity of 10,000 gallons or less and does not require refilling more than once weekly.
11. Facilities of a type not addressed in 1-10 above, and not exclusively dedicated to retail distribution of consumer products (such as gasoline stations, or hardware, paint, and dry-cleaning stores) that:
 - a. use a classified Class A or B explosive (per Title 49, Code of Federal Regulations, 171-179); or
 - b. use substances classified as high-level radioactive materials; or
 - c. use specified quantities of regulated substances (pursuant to Title 19 of the California Code of Regulations, Division 2, Chapter 4.5) and meet all of the following criteria:
 - a. The regulated substance(s) is stored as a compressed gas or liquefied compressed gas, or is expected to vaporize or evaporate quickly upon release (e.g., through failure of container, piping, or valve), or is stored as a liquid at a temperature that exceeds its boiling point;
 - b. The regulated substance(s) has the potential to cause a significant risk to public safety according to the County's environmental thresholds. (For example, the regulated substance(s) exists as a gas or vapor upon accident release, and will either release into the open atmosphere or become dangerously explosive in a confined environment.)
 - c. The regulated substance(s) is associated with a specific activity that is generally considered to be incompatible with surrounding land uses.
12. All development proposed in proximity to one or more existing hazardous facilities as described above, unless (a) the hazardous facility(ies) are inoperative for the purpose of abandonment, or (b) the proposed development is a single family residential unit which the County considers to be a voluntary exposure to the hazardous facility, or (c) the proposed development does not require a discretionary land-use action.

In cases 1 through 11 listed above, these thresholds apply to risks imposed on present and reasonably projected future land use, considering principally permitted uses under current zoning along with any conditional uses that are permitted or under review.

With regard to land uses with transitory populations (e.g., parks, roads, pedestrian and bike paths), these thresholds apply only when these populations are considered to be often present often or to often flow continuously (e.g., a frequently used recreational park or frequently traveled road). They do not apply when transitory populations are considered to be sporadic or often absent (e.g., hiking trails and other uses where the infrequent presence of people renders inclusion herein as overly speculative).

These thresholds do not apply to occupational safety (i.e., employees of the hazardous facility or people who visit the hazardous facility to provide services or conduct business). Occupational risk, which is governed by State and Federal OSHA, is considered to be more voluntary characteristically and, as such, is generally judged according to more lenient standards of significance than those used for involuntary exposure.

Additionally, these thresholds do not address impacts other than public safety, although accidents that

involve hazardous materials potentially impact communities and the environment in other ways (e.g., ecological damage, ground/surface water contamination, demand on fire and police services, economic disruption, interruption to surrounding land uses). These thresholds may be used to address the probability of such impacts occurring. The determination of significance of all such impacts is left to other applicable thresholds and the judgment of specialists that address those impacts in environmental reviews.

Lastly, these thresholds do not address issues of chronic risks which adversely impact public health as a result of long-term or repeated exposure to a hazardous material or situation. Issues of chronic exposure to air toxins are covered under the thresholds for air quality, and the Air Pollution Control District advises on appropriate methodology for modeling air quality. Air quality modeling and methods of health risk assessment to address soil and water contamination differ from those applied to acute risks. Consequently, any application of this threshold to determine the significance of chronic risk should be done so cautiously, making necessary adjustments to the threshold as necessary.

D. Determining When To Do Quantitative Risk Analysis.

The thresholds of significance Subsection E, below, are designed for use during the preparation of an environmental impact report if the initial study reveals substantial evidence of a potentially significant risk to public safety due to exposure to hazardous materials. Comprehensive quantitative analysis of societal risk is necessary at this stage; however, this level of analysis is not required to prepare an initial study.

Instead, a four-step screening methodology is used during the preparation of the initial study for determining the potential of a project to have a significant effect on public safety.

1. Certain facilities, such as major sour gas pipelines and gas processing facilities that support offshore oil and gas facilities, would automatically be subject to quantitative risk analysis and the risk thresholds.
2. For facilities not included in step 1, staff first determines the hazard zone based on the threshold levels of concentration for the particular hazardous materials involved and reasonably worst-case accidents. Levels of concentration for most chemicals are identified by the state. The hazard zones for materials commonly used in the county will be determined. Any hazard zone that encompasses other potentially inhabitable land uses triggers step 3, inclusive of non-hazardous development (other than a single-family residence) proposed within the hazard zone of an existing hazardous facility. Otherwise, the proposed project is not considered to have a significant impact due to acute exposure to hazardous materials.
3. If the hazard zone encompasses off-site receptors, staff then calculates the Individual Risk for the hazardous material(s) involved, based on the probability of an accident occurring, and proceeds to Step 4. Calculations may be pre-determined based on existing information or will be accomplished through a qualified risk analyst.
4. Staff adjusts the Individual Risk to reflect conditional probabilities, called the Individual Specific Risk. Such probabilities address factors such as number of hours in the day in which someone is present in the hazard zone. A measurement of one in a million (1×10^{-6}) on an annual basis indicates sufficient evidence to trigger the risk thresholds and a comprehensive risk analysis.

E. Using These Risk Thresholds.

When an Environmental Impact Report is required, the CEQA Guidelines stipulate that it identify and

focus on significant environmental effects of a proposed project. Such efforts include health and safety problems caused by the physical changes to the environment and any significant effects the project might cause by bringing development and people into the area affected by a significant hazard (section 15126). In so doing, the report must also identify and describe any significant environment effects which cannot be avoided if the proposed project is approved and implemented (generally referred to as unavoidable impacts). The Governor's Office of Planning and Research recommends that CEQA lead agencies establish thresholds of significance. These thresholds may be qualitative, quantitative, or both, whichever form best fits their purpose of providing an analytical method to gauge the significance of a particular environmental effect in a consistent, efficient, and predictable manner.

For identifying the significance of impacts to public safety for purposes of CEQA compliance, the County has consistently focused on quantifying societal risk. In general, risk is a compound measure of the probability and consequences of an adverse effect. Common expressions of risk include individual risk and societal risk. Individual risk is somewhat restricted in its ability to reflect actual risk; it only expresses the risk to a single individual without consideration of the total vulnerable population in a hazardous zone (e.g., a remotely located facility carries an equivalent individual risk as one located next to a hospital). Societal risk, illustrated as a risk spectrum, expresses a continuous variation in risk as a relationship of probability and consequence, the latter measuring the number of estimated fatalities and serious injuries.

The thresholds illustrated in figures 1 and 2 require quantitative risk analysis to determine the total societal risk attributable to the full set of possible accidents that can occur from the operation of a hazardous facility or undertaking of an activity that involves handling of hazardous materials. The analysis must consider both the significance of the risk and the beneficial effect of mitigation. It must also comply with County guidelines for risk assessment to ensure compatibility with the thresholds and consistency over time. When these thresholds are applied to proposed development in proximity to an existing hazardous operation, the risk measurement must be adjusted to reflect reductions in risk due to mitigation and to reflect societal risk to the newly proposed development.

These thresholds refine previous, quantitative thresholds by employing the entire risk spectra of a project and they refine the qualitative character of previous thresholds by employing qualitative factors into the determination of significance. The thresholds provide three zones -- green, amber, and red -- for guiding the determination of significance or insignificance based on the estimated probability and consequence of an accident. Risk analysis is based on best available data and modeling techniques but still requires informed assumptions to compensate for gaps in data, shortfalls in modeling, or ability to predict future outcomes with 100 percent accuracy. Given the unavoidable margin of error associated with any projection, the amber zone represents an area where caution is recommended, particularly considering the presence or absence of relevant qualitative factors; meanwhile, the overall goal should remain focused on maximizing public safety, using feasible mitigation to achieve a risk spectrum that falls solely within the green zone.

Risk spectra plotted on the thresholds should be interpreted as follows for purposes of determining the potential significance of an adverse impact to public safety.

1. **Class I Impact.** Class I applies to adverse impacts that, following environmental review, the County considers to be unavoidable and significant (i.e., cannot be mitigated to insignificance via feasible measures).

Regarding public safety, the County considers a societal risk spectrum that falls in the red or amber zones after application of all feasible mitigation to be an unavoidable, significant impact on public safety.

Class I impacts to public safety may constitute an unreasonable risk, considering how far the risk spectrum penetrates into the red zone, the feasibility of alternative locations with lesser risk, other qualitative factors, and applicable law and guidelines. Unreasonable risk shall be determined for each project individually, based on policies provided in the Safety Element and other relevant policies and codes. Lacking any such determination, project approval requires a statement of overriding considerations by the applicable land-use authority, showing that the benefits of the proposed development exceed its adverse impacts to public safety.

2. **Class II Impact.** Class II applies to adverse impacts that, following environmental review, the County considers to be significant but avoidable through application of feasible mitigation (i.e., mitigation can render the impact to be insignificant).

Regarding public safety, the County considers a societal risk spectrum that falls in either the red or amber zones to be a significant impact to public safety. Such risk shall be considered a Class II impact for purposes of compliance with CEQA if application of feasible mitigation is sufficient to lower the risk spectrum so that it falls fully within the green zone.

3. **Class III Impact.** Class III applies to adverse impacts that, following environmental review, the County considers to be insignificant for purposes of complying with CEQA.

Regarding public safety, the County considers a societal risk spectrum that falls completely in the green zone to be a Class III, insignificant impact to public safety and no mitigation (or additional mitigation) is required for purposes of compliance with CEQA.

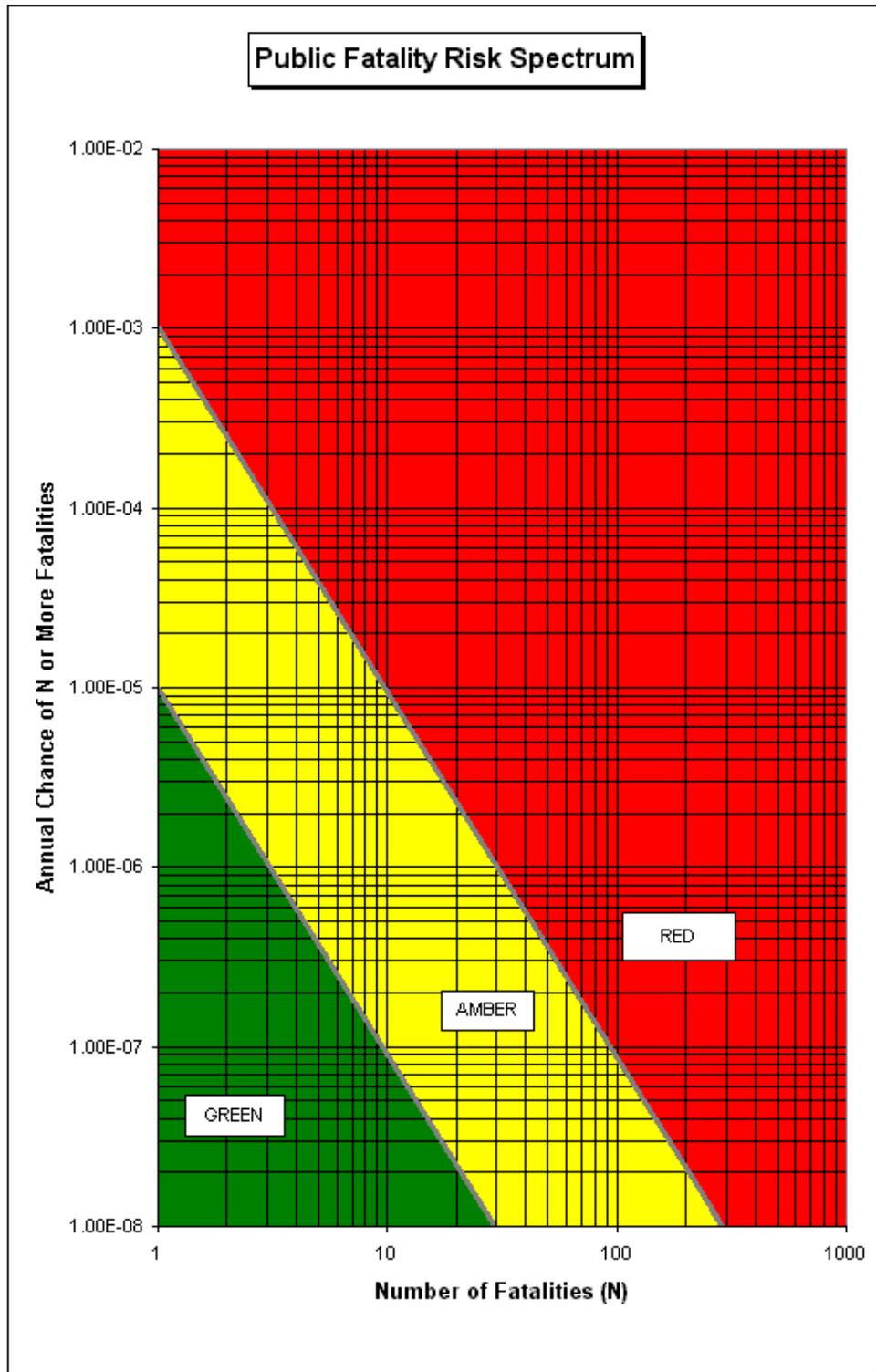


Figure 1 - Santa Barbara Fatality Risk Thresholds

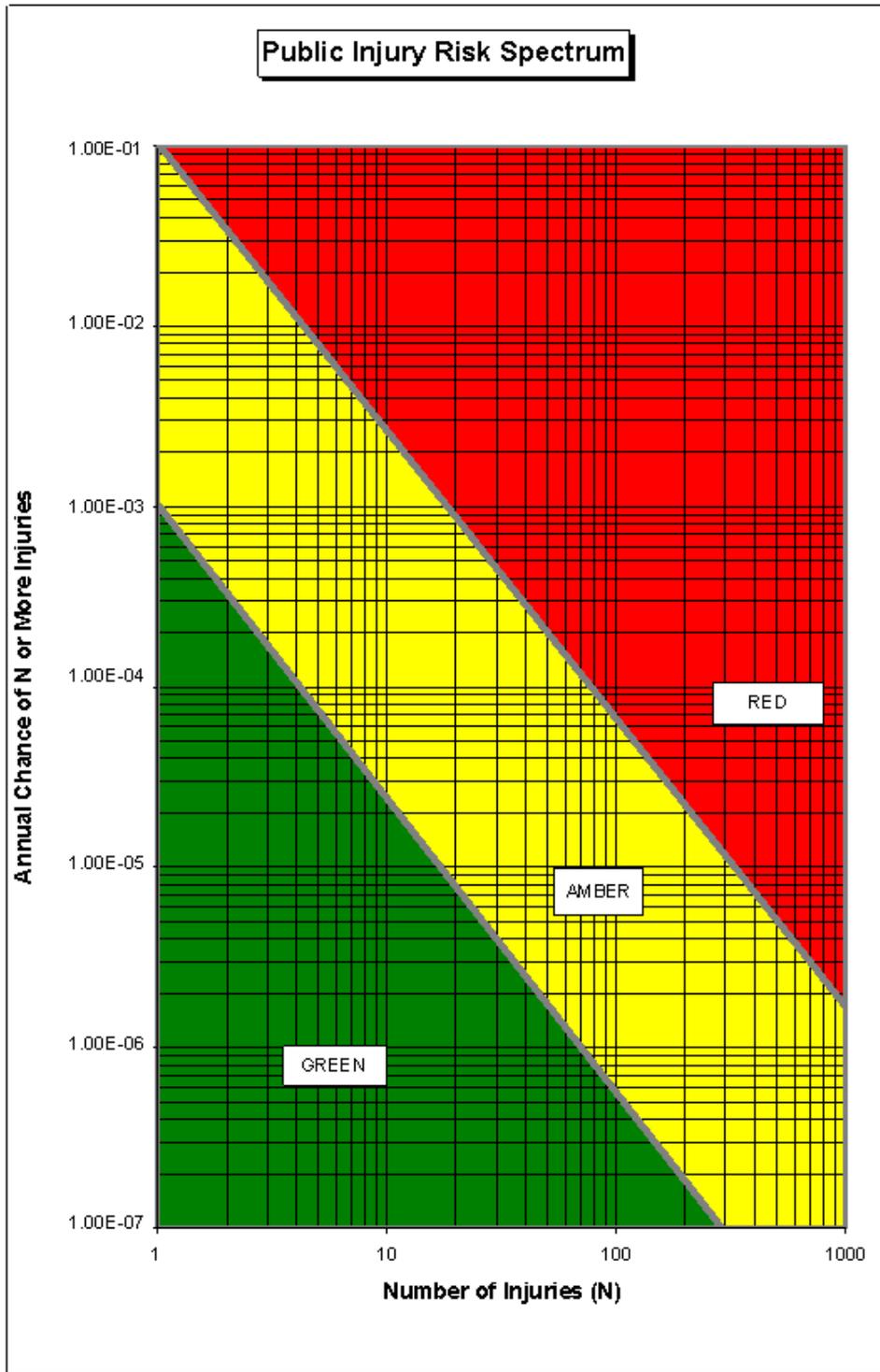


Figure 2 - Santa Barbara Injury Risk Thresholds

15. SCHOOLS THRESHOLDS (INTERIM) *(Approved by the Board of Supervisors, August 1993)*

A. Issue Summary.

The issue of existing and potential overcrowding of school facilities is of concern both locally and State-wide given the overall fiscal situation throughout the State of California and given the legal constraints regarding collection of funds and other mitigation on a project specific level. Several of the school districts in the County are currently experiencing overcrowding, including the Orcutt Union School District, Santa Maria Joint Union High School, and Hope School District, among others. Increased enrollment is difficult for the districts to deal with for a number of reasons which vary by district, including lack of existing facilities, lack of funding to construct new facilities and fund additional teachers, and lack of land to accommodate expanding campuses.

Under existing state law, a local jurisdiction cannot require mitigations or apply conditions which exceed the fees as allowed by state law for a development project which is consistent with its General Plan Designation. In many instances, this creates a situation where overcrowding may result from a project without the opportunity for mitigation through project conditions attached to a County permit. However, there are other measures, beyond the authority of the County, which may be used by the State and the school districts to address school facility impacts. These may include the use of temporary/portable classrooms, intra- or inter-district student transfers to less crowded schools, double session or year-round school schedules, and combination of classes of students on several grade levels. In the situation where the County is not able to recommend project specific mitigation which may reduce impacts to school facilities, the focus of CEQA is to disclose the impacts and to discuss the options which the school districts may use to address the overcrowding issue.

B. Determination of Significant Impact.

A significant level of school impacts is generally considered to occur when a project would generate sufficient students to require an additional classroom. This assumes 29 students per classroom for elementary/junior high students, and 28 students per classroom for high school students, based on the lowest student per classroom loading standards of the State school building program. This threshold is to be applied in those school districts which are currently approaching, at, or exceeding their current capacity.

A project's contribution to cumulative schools impacts will be considered significant if the project specific impact as described above is considered significant.

C. Methodology for Determining Significance.

At the present time, the Planning and Development Department has very little countywide information regarding school capacity status. Until we have compiled information on the various school districts in the County, the project planner should individually contact districts which may be affected by their project. A form has been developed which includes relevant questions to ask the affected districts regarding capacity, enrollment projections, and facility information. This form should be used to ensure that adequate information is received from the districts to determine if a significant impact would occur from the project.

D. Context of Analysis.

Based upon Corona-Norco USD v. City of Corona, an ND rather than an EIR may be prepared for development projects having Class I impacts only on schools (schools impacts are the only cause for preparation of an EIR) for which mitigation is limited by law to payment of standard fees.

E. Mitigation Measures.

The following mitigation measures may be used to address impacts to affected schools. However, mitigation is limited by state law. For projects which do not involve a legislative act, payment of standard fees, as specified in the second mitigation measure, is the maximum mitigation allowed. *Staff is currently reviewing mitigation options for projects which do involve a legislative act based upon the outcome of the recent election and other possible changes in applicable law. Staff will provide mitigation language for the Planning Commission's review during the hearing process on the thresholds.*

1. The applicant shall notify the *[Planner insert appropriate school district]* of the expected buildout date of the project to allow the District to plan in advance for new students.

Plan Requirement: A copy of the notice shall sent to P&D prior to land use clearance for the project.

Monitoring: P&D shall ensure letter is sent prior to issuing land use clearance.

2. The applicant shall pay the adopted fees per square foot of livable space being created by the project to the appropriate school district(s). These fees are used by the districts to construct temporary or permanent classroom space, but are not used to provide additional teachers.

Plan Requirements and Timing: The applicant shall submit final square footage calculations and a copy of the fee payment to the school district(s) prior to _____.

Monitoring: P&D shall ensure payment made prior to issuance of building permits.

16. SURFACE AND STORM WATER QUALITY SIGNIFICANCE GUIDELINES (Approved by the Board of Supervisors September 2002)

A. Introduction.

The following information is excerpted from several EPA publications including the preamble to the NPDES Phase II rules as published in the Federal Register¹ and EPA storm water fact sheets and guidance documents².

Storm water runoff from lands modified by human activities can harm surface water resources and, in turn, cause or contribute to an exceedance of water quality standards by changing natural hydrologic patterns, accelerating stream flows, destroying aquatic habitat, and elevating pollutant concentrations. Such runoff may contain or mobilize high levels of contaminants, such as sediment, suspended solids, nutrients (phosphorous and nitrogen), heavy metals and other toxic pollutants, pathogens, oxygen-demanding substances, and floatables. After a rain, storm water runoff carries these pollutants into nearby streams, rivers, lakes, estuaries, wetlands, and oceans. The highest concentrations of these contaminants often are contained in “first flush” discharges, which occur during the first major storm after an extended dry period. Individually and combined, these pollutants impair water quality, threatening designated beneficial uses and causing habitat alteration or destruction. Uncontrolled storm water discharges from areas of urban development and construction activity negatively impact receiving waters by changing the physical, biological, and chemical composition of the water, resulting in an unhealthy environment for aquatic organisms, wildlife, and humans. Although water quality problems also can occur from agricultural storm water discharges and return flows from irrigated agriculture, this area of concern is statutorily exempted from regulation as a point source under the Clean Water Act and is not addressed in these guidelines.

Urbanization alters the natural infiltration capability of the land and generates a host of pollutants that are associated with the activities of dense populations, thus causing an increase in storm water runoff volumes and pollutant loading in storm water that is discharged to receiving waterbodies. Urban development increases the amount of impervious surface in a watershed as farmland, forests, and other natural vegetation with natural infiltration characteristics are converted into buildings with rooftops, driveways, sidewalks, roads, and parking lots with virtually no ability to absorb storm water. Storm water runoff washes over these impervious areas, picking up pollutants along the way while gaining speed and volume because of their inability to disperse and filter into the ground. What results are storm water flows that are higher in volume, pollutants, and temperature than the flows from more pervious areas, which have more natural vegetation and soil to filter the runoff. Studies reveal that the level of imperviousness in an area strongly correlates with decreased quality of the nearby receiving waters. Research conducted in numerous geographical areas, concentrating on various variables and employing widely differing methods, has revealed that stream degradation occurs at relatively low levels of imperviousness, such as 10 to 20 percent (even as low as 5 to 10 percent). Furthermore, research has indicated that few, if any, urban streams can support diverse benthic communities at imperviousness levels of 25 percent or more. An area of medium density single family homes can be anywhere from 25 percent to nearly 60 percent impervious, depending on the design of the streets and parking.

¹ 64 FR 68722

² Available on the Internet at www.epa.gov/npdes.

Relationship of Sources to Primary Pollutants of Concern

Pollutant Source/Activity	Primary Pollutants of Concern in Urban Runoff*								
	Physical Parameters ^a	Synthetic Organics ^b	Petroleum Hydrocarbons ^c	Heavy Metals ^d	Nutrients	Pathogens	Sediments	Oxygen-Demanding Substances ^e	Floatables ^f
Vehicle Service Facilities		•	•	•					
Gas Stations		•	•	•					
Metal Fabrication Shops		•	•	•					
Restaurants									•
Auto Wrecking Yards	•	•	•	•					
Mobile Cleaners		•							
Parking Lots	•		•	•					•
Residential Dwellings	•	•		•	•	•	•	•	
Parks/Open Spaces					•	•	•	•	•
Construction Sites	•						•	•	
Corporation Yards	•	•	•	•					
Streets & Highways	•		•	•				•	•
Marinas									•
Golf Courses		•			•		•	•	
Sewer Overflows	•					•		•	

a. salinity, pH, temperature. b. pesticides, herbicides, PCBs. c. oil, grease, solvents. d. lead, copper, zinc, cadmium. e. plant debris, animal waste. f. litter, yard wastes.

* adapted from *Model Urban Runoff Program*. July 1998. City of Monterey, City of Santa Cruz, California Coastal Commission, Monterey Bay National Marine Sanctuary, Association of Monterey Bay Area Governments, Woodward-Clyde and Central Coast Regional Water Quality Control Board. EPA Assistance Agreement No. C9-999266-95-0.

In addition to impervious areas, urban development creates new pollution sources as population density increases and brings with it proportionately higher levels of car emissions, car maintenance wastes, pet waste, litter, pesticides, and household hazardous wastes, which may be washed into receiving waters by storm water or dumped directly into storm drains designed to discharge to receiving waters. More people in less space results in a greater concentration of pollutants that can be mobilized by storm water discharges into storm sewer systems.

The first national assessment of urban runoff characteristics was completed for the *Nationwide Urban Runoff Program (NURP)* study. The NURP study is the largest nationwide evaluation of storm water discharges undertaken to date. EPA conducted the NURP study to facilitate understanding of the nature of urban runoff from residential, commercial, and industrial areas. One objective of the study was to characterize the water quality of discharges from separate storm sewer systems that drain residential, commercial, and light industrial (industrial parks) sites. Storm water samples from 81 residential and commercial properties in 22 urban/suburban areas nationwide were collected and analyzed during the five-year period between 1978 and 1983. The majority of samples collected in the study were analyzed for eight conventional pollutants and three heavy metals. Data collected under the NURP study indicated that discharges from separate storm sewer systems draining runoff from residential, commercial, and light industrial areas carried more than 10 times the annual loading of total suspended solids (TSS) than discharges from municipal sewage treatment plants that provide secondary treatment. The NURP study also indicated that runoff from residential and commercial areas carried somewhat

higher annual loadings of chemical oxygen demand (COD), total lead, and total copper than effluent from secondary treatment plants. Study findings showed that fecal coliform counts in urban runoff typically range from tens to hundreds of thousands of most probable number (MPN) per hundred milliliters (ml) of runoff during warm weather conditions, with the median for all sites being around 21,000 MPN/100 ml.

B. Construction Site Runoff.

Polluted storm water runoff from construction sites often flows to storm drains and ultimately is discharged into local rivers and streams. Of the pollutants listed below, sediment is usually the main pollutant of concern. Sediment runoff rates from construction sites are typically 10 to 20 times greater than those of agricultural lands, and 1,000 to 2,000 times greater than those of forest lands. During a short period of time, construction sites can contribute more sediment to streams than can be deposited naturally during several decades. The resulting siltation, and the contribution of other pollutants from construction sites, can cause physical, chemical, and biological harm to our nation's waters. The siltation process described previously can (1) deposit high concentrations of pollutants in public water supplies; (2) decrease the depth of a waterbody, which can reduce the volume of a reservoir or result in limited use of a water body by boaters, swimmers, and other recreational enthusiasts; and (3) directly impair the habitat of fish and other aquatic species, which can limit their ability to reproduce. Excess sediment can cause a number of other problems for waterbodies. It is associated with increased turbidity and reduced light penetration in the water column, as well as more long-term effects associated with habitat destruction and increased difficulty in filtering drinking water.

Pollutants Commonly Discharged From Construction Sites

Sediment	Pesticides
Solid and sanitary wastes	Concrete truck washout
Nitrogen (fertilizer)	Construction chemicals
Phosphorous (fertilizer)	Construction debris

C. Post Construction Runoff.

There are generally two forms of substantial impacts of post-construction runoff. The first is caused by an increase in the type and quantity of pollutants in storm water runoff. As runoff flows over areas altered by development, it picks up harmful sediment and chemicals such as oil and grease, pesticides, heavy metals, and nutrients (e.g., nitrogen and phosphorus). These pollutants often become suspended in runoff and are carried to receiving waters, such as lakes, ponds, and streams. Once deposited, these pollutants can enter the food chain through small aquatic life, eventually entering the tissues of fish and humans. The second kind of post-construction runoff impact occurs by increasing the quantity of water delivered to the waterbody during storms. Increased impervious surfaces interrupt the natural cycle of gradual percolation of water through vegetation and soil. Instead, water is collected from surfaces such as asphalt and concrete and routed to drainage systems where large volumes of runoff quickly flow to the nearest receiving water. The effects of this process include stream bank scouring and downstream flooding, which often lead to a loss of aquatic life and damage to property.

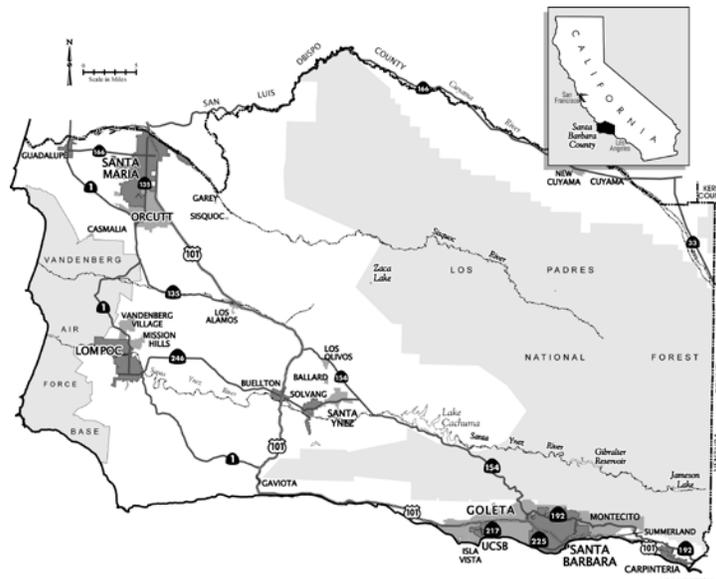
D. Federal and State Regulations.

The Federal Water Pollution Prevention and Control Act (i.e., the Clean Water Act or CWA) requires that discharges do not substantially degrade the physical, chemical or biological integrity of the Nation's waters. Specifically Section 402 established the National Pollutant Discharge Elimination System (NPDES) Regulations for wastewater and other pollutant discharges.

Congress amended the CWA in 1987 to require the implementation of a two-phased program to address storm water discharges. Phase I, promulgated by the U.S. Environmental Protection Agency (EPA) in

November 1990, requires NPDES permits for storm water discharges from municipal separate storm sewer systems (MS4s) serving populations of 100,000 or greater, construction sites disturbing greater than five acres of land, and ten categories of industrial activities.

Despite the comprehensiveness of the NPDES Phase I program, the EPA recognized that smaller construction projects (disturbing less than 5 acres) and small municipal separate storm sewers (MS4s³) were also contributing substantially to pollutant discharges nationwide. Therefore, in order to further improve storm water quality, the EPA promulgated the NPDES Phase II program (*Federal Register* Vol. 64, No. 235, December 8, 1999). The Phase II regulations became effective on February 7, 2000, and require NPDES permits for storm water discharges from regulated small MS4s and for construction sites disturbing more than 1 acre of land. The Phase II regulations published by the EPA designated the urbanized areas⁴ of Santa Barbara County as a regulated small MS4.



In addition, Section 401 and 404 established regulations for the discharge of dredged or fill material into waters of the United States and water quality impacts associated with these discharges. In California, the Porter-Cologne Water Quality Control Act establishes waste discharge standards pursuant to the Federal NPDES program, and the state has the authority to issue NPDES permits to individuals, businesses, and municipalities.

E. County Water Quality Issues.

Because the EPA has determined that the urbanized areas of Santa Barbara County are subject to the Phase II NPDES regulations, it is presumed that the county has a general urban runoff water quality problem. In addition to this general presumption, over the last three years Project Clean Water has collected analytical water quality data and identified the water quality concerns in county streams, creeks and beach areas. These concerns include:

- Bacteria levels consistently above applicable standards during storm events,
- Levels of metals (copper, chromium, zinc, and lead) approaching or exceeding Regional Water Quality Control Board Basin Plan objectives,

³ Those generally serving less than 100,000 people and located in an urbanized area as defined by the Bureau of the Census.

⁴ An urbanized area is a land area comprising one or more places (central place(s)) and the adjacent densely settled surrounding area (the urban fringe) that together have a residential population of at least 50,000 and an overall population density of at least 1,000 people per square mile.

- Elevated levels of nitrogen and phosphorus in all creeks during storm events, and
- Detection of pesticides in all watersheds.

The Regional Water Quality Control Board has also identified that the quality of several important recreational water bodies and water supplies have been impaired. These water bodies and their contaminants include:

- San Antonio Creek (northern) - sediments.
- Santa Ynez River - nutrients (e.g., phosphorus and nitrogen), salinity, total dissolved solids, chlorides and sediments.
- Goleta Slough - metals, pathogens, and sediment.
- Arroyo Burro Creek - pathogens (e.g., bacteria).
- Mission Creek - pathogens.
- Carpinteria Salt Marsh - nutrients and sediment.
- Carpinteria Creek - pathogens
- Rincon Creek - pathogens and sediment.

F. County Water Quality Protection Policies.

Policies regarding the protection of water quality in the unincorporated areas of Santa Barbara County are provided in the Comprehensive Plan Land Use Element, various Community Plans, and the Local Coastal Plan. The overarching policy which applies to both construction and post-construction is Land Use Element Hillside and Watershed Protection Policy 7 (Coastal Plan Policy 3-19), which states:

“Degradation of the water quality of groundwater basins, nearby streams, or wetlands shall not result from development of the site. Pollutants, such as chemicals, fuels, lubricants, raw sewage, and other harmful waste shall not be discharged into or alongside coastal streams or wetlands either during or after construction.”

Project approval requires a finding of consistency with this and all other applicable water quality policies in the Comprehensive and Community Plans.

G. Significance Guidelines for Assessment of Water Quality Impacts.

Guidelines for assessing project-specific and cumulative water quality impacts are presented below. The assessment of impacts must account for construction-related impacts (i.e., vegetation removal, erosion, use of construction materials on the site, and staging of construction activities) and post-construction (or post-development) impacts (i.e., increases in impervious surfaces and increased runoff, entrainment of pollutants, and effects of discharges on aquatic habitats and biota).

1. Project Specific Potential Significance Impacts.

- a. A significant water quality impact is presumed to occur if the project:
 - Is located within an urbanized area of the county and the project construction or redevelopment individually or as a part of a larger common plan of development or sale would disturb one (1) or more acres of land;
 - Increases the amount of impervious surfaces on a site by 25 percent or more;
 - Results in channelization or relocation of a natural drainage channel;
 - Results in removal or reduction of riparian vegetation or other vegetation (excluding non-native vegetation removed for restoration projects) from the buffer zone of any streams, creeks or wetlands;
 - Is an industrial facility that falls under one or more of categories of industrial

activity regulated under the NPDES Phase I industrial storm water regulations (facilities with effluent limitation; manufacturing; mineral, metal, oil and gas, hazardous waste, treatment or disposal facilities; landfills; recycling facilities; steam electric plants; transportation facilities; treatment works;; and light industrial activity);

- Discharges pollutants that exceed the water quality standards set forth in the applicable NPDES permit, the Regional Water Quality Control Board's (RWQCB) Basin Plan or otherwise impairs the beneficial uses⁵ of a receiving waterbody; or
 - Results in a discharge of pollutants into an "impaired" waterbody that has been designated as such by the State Water Resources Control Board or the RWQCB under Section 303 (d) of the Federal Water Pollution Prevention and Control Act (i.e., the Clean Water Act).
 - Results in a discharge of pollutants of concern to a receiving water body, as identified in by the RWQCB.
- b. Projects that are not specifically identified on the above list or are located outside of the "urbanized areas" may also have a project-specific storm water quality impact. Storm water quality impacts associated with these projects must be evaluated on a project by project basis for a determination of significance. The potential impacts of these projects should be determined in consultation with the county Water Agency, Flood Control Division, and RWQCB. The issues that should be considered are:
- the size of the development;
 - the location (proximity to sensitive waterbodies, location on hillsides, etc.);
 - the timing and duration of the construction activity;
 - the nature and extent of directly connected impervious areas;
 - the extent to which the natural runoff patterns are altered;
 - disturbance to riparian corridors or other native vegetation on or off-site;
 - the type of storm water pollutants expected; and
 - the extent to which water quality best management practices are included in the project design.
- c. All projects determined to have a potentially significant storm water quality impact must prepare and implement a Storm Water Quality Management Plan (SWQMP) to reduce the impact to the maximum extent practicable. The SWQMP shall include the following elements:
- identification of potential pollutant sources that may affect the quality of the discharges to storm water;
 - the proposed design and placement of structural and non-structural best management practices (BMPs) to address identified pollutants;
 - a proposed inspection and maintenance program; and
 - a method of ensuring maintenance of all BMPs over the life of the project.

Implementation of best management practices identified in the SWQMP will generally be considered to reduce the storm water quality impact to a less than significant level.

⁵ Beneficial uses for Santa Barbara County are identified by the Regional Water Quality Control Board in the Water Quality Control Plan for the Central Coastal Basin, or Basin Plan, and include (among others) recreation, agricultural supply, groundwater recharge, fresh water habitat, estuarine habitat, support for rare, threatened or endangered species, preservation of biological habitats of special significance.

2. **Less than Significant Impacts.** The following land uses and projects are generally presumed to have a less than significant project-specific water quality impact. These include:
 - Redevelopment projects that do not increase the amount of impervious surfaces on the site nor change the land use or potential pollutants;
 - New development and redevelopment projects that incorporate into the project design construction BMPs for erosion, sediment and construction waste control and incorporate post-construction BMPs to protect sensitive riparian or wetland resources, reduce the quantity of runoff, and treat runoff generated by the project to pre-project levels;
 - Lot line adjustments that do not alter the development potential of the lots involved;
 - Development of a single family dwelling (and associated accessory uses including but not limited to roads and driveways, septic systems, guesthouse, pool, etc.) disturbing less than one acre on existing legal lot.
3. **Cumulative Impacts.** Because of the county's designation under the Phase II NPDES regulations, all discretionary projects (except those that do not result in a physical change to the environment) within the urbanized area whose contributions are cumulatively considerable must implement one or more best management practices to reduce their contribution to the cumulative impact.

H. General Mitigation Guidelines for Water Quality Impacts.

If water quality impacts are considered from the beginning stages of a project more opportunities are available for water quality protection. Best management practices (mitigation measures) chosen for a project should minimize water quality impacts and attempt to maintain pre-development runoff conditions. Best management practices are divided into two main categories, non-structural BMPs and structural BMPs.

Non-structural BMPs are preventative actions that involve management and source controls such as protecting and restoring sensitive areas such as wetlands and riparian corridors, maintaining and/or increasing open space, providing buffers along sensitive water bodies, minimizing impervious surfaces and directly connected impervious areas, and minimizing disturbance of soils and vegetation. Structural BMPs include: storage practices such as wet ponds and extended-detention outlet structures; filtration practices such as grassed swales, sand filters and filter strips; and infiltration practices such as infiltration basins and infiltration trenches. In many cases combinations of non-structural and structural measures will be required to reduce water quality impacts.

Non-structural and structural BMPs most applicable to the development projects in the county are included in "A Planner's Guide to Conditions of Approval and Standard Mitigation Measures" and the county's adopted BMP manuals for construction site runoff control. Additional guidance on best management practices is available from the State⁶, the EPA⁷ and from other sources such as BASMAA "Starting at the Source"⁸. Storm water technologies are constantly being improved, and staff and developers must be responsive to any changes, developments or improvements in control technologies.

⁶ *California Storm Water Best Management Practice Handbooks* (California Stormwater Quality Task Force, 1993).

⁷ On the Internet at www.epa.gov/npdes/menuofbmps/menu.htm.

⁸ *Start at the Source: Design Guidance Manual for Stormwater Quality Protection* (Bay Area Stormwater Management Agencies Association, 1999).

17. SOLID WASTE THRESHOLDS *(Approved by the Board of Supervisors, August 1993; revised by the Board of Supervisors, September 16, 2008)*

A. Background and Existing Policies.

Four landfills operate within the County. These landfills include: the County operated Tajiguas Landfill (serving the South Coast, Santa Ynez Valley, Cuyama and Ventucopa), the City operated Santa Maria Landfill (serving the City of Santa Maria and the unincorporated areas of the Santa Maria Valley), the City operated Lompoc Landfill (serving the City of Lompoc and unincorporated areas of the Lompoc Valley, and the federally operated Vandenberg Air Force Base Landfill (serving Vandenberg Air Force Base). Two waste recycling and transfer stations and two waste transfer stations also serve the County's unincorporated areas including: the South Coast Recycling and Transfer Station (serving the South Coast area) , the Santa Ynez Valley Recycling and Transfer Station (serving the Santa Ynez Valley), the Cuyama Transfer Station (serving Cuyama Valley), and the Ventucopa Transfer Station (serving the Ventucopa area).

In September 1989, the California Integrated Solid Waste Management Act (also known as AB 939) was enacted into law. It required each municipality in the state to divert at least 50 percent of its solid waste from landfill disposal through source reduction, recycling, and composting by 2000. This 50 percent requirement also includes the waste stream that comes exclusively through construction and demolition (C&D) of buildings and homes in the County.

As of 2004, 63 percent of all solid waste generated in the unincorporated areas of the County of Santa Barbara was diverted for recycling or re-use (as certified by the California Integrated Waste Management Board). This diversion level is the result of implementation of the County Source Reduction and Recycling Element adopted by the Board of Supervisors in February 1992. Despite these diversion levels, landfill space is still limited.

In order to preserve our limited landfill resources, the County must maintain its high levels of diversion. New construction, especially remodeling and demolition, represents the greatest challenge to maintaining existing diversion rates. The solid waste thresholds described in this section will establish when a discretionary project is considered to result in a significant solid waste impact under the California Environmental Quality Act. Considering solid waste impacts of new development and providing mitigation to reduce solid waste will help the County maintain its State-mandated diversion rates and minimize impacts to the County's limited landfill space.

The primary mitigation measure for reducing solid waste impacts to less than significant level is preparation and implementation of a Solid Waste Management Plan (SWMP). The Public Works Department maintains a sample SWMP for public distribution with all permit applications that are expected to exceed thresholds. In addition, Land Use Development Policy 4 of the County's Comprehensive Plan Land Use Element requires a finding that there are adequate public services (in this case landfill capacity) to serve new development. This policy also provides the basis for inclusion of waste reduction mitigation measures as part of the conditions of project approval. Preparation and implementation of a SWMP for projects that exceed the defined threshold will reduce all solid waste impacts to a less than significant level.

B. Impact Assessment.

Solid waste impacts can be divided into two categories: 1) short-term waste generated from construction and demolition projects, and 2) long-term waste generated during project occupancy/operation.

1. **Waste generation during construction.** Generation of construction and demolition waste per cubic foot varies widely depending on the type and location of the project. Here are some general guidelines:

Commercial Development	Amounts in Pounds per Square foot
Remodel	40
Demolition	100
New construction	25
Residential Development	Amounts in Pounds per Square foot
Remodel	100
Demolition	60
New construction	15

These estimates are based on the US Environmental Protection Agency’s 1998 construction and demolition study (Document: EPA530-R-98-010; June 1998) and data gathered by the San Luis Obispo Integrated Waste Management Authority in 2005 and 2006.

2. **Waste generation during occupancy/operations.**

- a. **Residential projects.** The annual per capita waste generation rate for Santa Barbara County is currently 2.11 tons. Of this 2.11 tons, the residential per capita waste generation rate is 0.95 tons (1,900 pounds), including interior and exterior waste. Waste generation rates are based on the County of Santa Barbara Waste Generation Study (February, 1991) and the Area Planning Council Forecast of 1989.

The County average residents per household rates are:

Single family residence: 3.01 people per household

Attached residences (condos, townhomes, apartments, duplex, triplex): 2.65 people per household

(These statistics come from 1990 census date, C. Pauley, Comprehensive Planning RMD.)

To calculate a residential project’s solid waste generation the following formula is used:

For single family residence: 3.01 people/unit x # of units x 0.95 tons/year = tons/year/project.

For attached units: 2.65 people/unit x # of units x 0.95 tons/year = tons/year/project.

- b. **Commercial/industrial/institutional projects.** To determine the waste stream for a specific project the following information is provided:

Type/Description	Annual Generation Rate (in tons)
Neighborhood Center (30,000 to 100,000 sq. ft.)	sq. ft. x 0.0009
Regional Shopping Center (100,000 to 300,000 sq. ft.)	sq. ft. x 0.0012 (anchor store) sq. ft. x 0.0048 (tenant)
General Retail and Miscellaneous Services	sq. ft. x 0.0057
Eating and Drinking Establishment	sq. ft. x 0.0115
Automobile Dealer and Service Station	sq. ft. x 0.0016
Hotel and Motel	# of rooms x 0.80
Warehouse	sq. ft. x 0.0016
Health Services	sq. ft. x 0.0013
Hospital	# of rooms x 1.90

Office	sq. ft. x 0.0013
Educational Institutions	sq. ft. x 0.0010
Transportation, Communications and Utilities	sq. ft. x 0.0026
Manufacturing	sq. ft. x 0.0026

(Figures are based on Industry & National Standards as discussed in the Ventura County Solid Waste Thresholds)

For project types that are indicated above, the estimated waste stream can be determined by surveying similar uses, ideally within Santa Barbara County. If possible, three such uses should be used in the survey.

Residual Impact Calculation: Waste Generation (tons per year) x 0.50 (% of waste reduction) = tons per year.

C. Thresholds of Significance.

1. **Construction and demolition.** Construction and demolition waste accounts for 31 percent of all waste generated by residents of Santa Barbara County. In order to comply with AB939 requiring a minimum of 50 percent of all waste to be diverted from landfills, the particular source of waste has been targeted.

Any construction, demolition or remodeling project of a commercial, industrial or residential development that is projected to create more than 350 tons of construction and demolition debris is considered to have a significant impact on public services.

Although amounts of waste generated vary project to project we have the following estimates of projects that will reach the threshold of significance:

- a. Remodeling projects over 7,000 square feet for residential projects and 17,500 square feet for commercial/industrial projects.
- b. Demolition projects over 11,600 square feet for residential buildings and 7,000 square feet for commercial/industrial buildings.
- c. New construction projects over 47,000 square feet for residential buildings and 28,000 square feet for commercial/industrial buildings.

These estimates are based on the US Environmental Protection Agency’s 1998 construction and demolition study (Document: EPA530-R-98-010; June 1998) and data gathered by the San Luis Obispo Integrated Waste Management Authority in 2005 and 2006.

2. **Operations/occupancy.**

- a. **Project specific.** The following thresholds are based on the projected average solid waste generation for Santa Barbara County from 1990 - 2005. The goals outlined in the Source Reduction and Recycling Element (SRRE) assume a 1.2 percent annual increase, which equates to approximately 4,000 tons per year increase in solid waste generation over the 15 year period. A project is considered to result in a significant impact to landfill capacity if it would generate five percent or more of the expected annual increase in waste generation thereby using a significant portion of the remaining landfill capacity. Based on the analysis conducted (as illustrated in Table 1), the numerical value associated with the five percent increase is 196 tons per year. As indicated above, source reduction, recycling and composting can reduce a project’s waste stream (generated during operations) by as much as 50 percent. If a proposed project generates 196 or more tons per year after reduction and recycling efforts, impacts would be considered significant and unavoidable (Class I). Project approval

would then require the adoption of overriding considerations. A typical single family residential project of 68 units or less would not trigger the threshold of significance.

- b. Cumulative thresholds.** Projects with a specific impact as identified above (196 tons/year or more) would also be considered cumulatively significant, as the project specific threshold of significance is based on a cumulative growth scenario. However, as landfill space is already extremely limited, any increase of one percent or more of the estimated increase accounted for in the SRRE, mitigation would be considered an adverse contribution (Class III) to regional cumulative solid waste impacts. One percent of the SRRE projected increase in solid waste equates to 40 tons per year (in operational impacts). To reduce adverse cumulative impacts, and to be consistent with the SRRE, mitigation should be recommended for projects which generate between 40 and 196 tons of solid waste per year. Projects which generate less than 40 tons per year of solid waste would not be considered to have an adverse effect due to the small amount of solid waste generated by these projects and the existing waste reduction provisions in the SRRE. A typical single family residential project of 14 units or less would not trigger this adverse impact level.

D. Mitigation Measures.

The following mitigation measures are suggested for projects which would exceed County solid waste thresholds. This is a partial list of measures and does not preclude measures which may be applicable on a project specific basis.

The applicant shall develop and implement a solid waste management plan to be reviewed and approved by Public Works Department Resource Recovery and Waste Management Division and the Planning and Development Department and shall include one or more of the following measures:

- Provision of space and/or bins for storage of recyclable materials within the site.
- Establishment of a recyclable material pickup area.
- Implementation of a curbside recycling program to serve new development.
- Development of a plan for accessible collection of materials on a regular basis (may require establishment of private pick-up depending on availability of County sponsored programs).
- Implementation of a monitoring program (quarterly, bi-annually) to ensure a 35 - 50 percent minimum participation in recycling efforts, requiring businesses to show written documentation in the form of receipts.
- Development of Source Reduction Measures, indicating method and amount of expected reduction.
- Implementation of a program to purchase recycled materials used in association with the proposed project (paper, newsprint etc.). This could include requesting suppliers to show recycled material content.
- Implementation of a backyard composting yard waste reduction program.

One or more of the above measures may apply to a specific project. County waste characterization studies estimate that implementation of the measures described can reduce waste generation by 50 percent. The expected reduction in waste generation from mitigation measures for a specific project should be developed in consultation with the Public Works Department Resource Recovery and Waste Management Division.

Table 1 - Solid Waste Threshold Calculations

Table 5: Solid Waste Threshold Calculations													
Year	Residential Generation	Change	5% of Change	Commercial Generation	Change	5% of Change	Industrial Generation	Change	5% of Change	Total Generation	Change	5% of Change	1% of Change
1990	156640	1760	88	98650	1290	64.5	52780	450	22.5	308070	3500	175	35
1991	158400	1910	95.5	99940	1300	65	53230	450	22.5	311570	3660	183	36.6
1992	160310	1920	96	101240	1310	65.5	53680	450	22.5	315230	3680	184	36.8
1993	162230	1940	97	102550	1330	66.5	54130	460	23	318910	3730	186.5	37.3
1994	164170	1970	98.5	103880	1350	67.5	54590	460	23	322640	3780	189	37.8
1995	166140	2000	100	105230	1370	68.5	55050	460	23	326420	3830	191.5	38.3
1996	168140	2020	101	106600	1380	69	55510	470	23.5	330250	3870	193.5	38.7
1997	170160	2040	102	107980	1400	70	55980	480	24	334120	3920	196	39.2
1998	172200	2060	103	109380	1420	71	56460	480	24	338040	3960	198	39.6
1999	174260	2090	104.5	110800	1440	72	56940	480	24	342000	4010	200.5	40.1
2000	176350	2130	106.5	112240	1450	72.5	57420	480	24	346010	4060	203	40.6
2001	178480	2130	106.5	113690	1480	74	57900	490	24.5	350070	4100	205	41
2001	180610	2170	108.5	115170	1500	75	58390	490	24.5	354170	4160	208	41.6
2003	182780	2190	109.5	116670	1510	75.5	58880	500	25	358330	4200	210	42
2004	184970	2230	111.5	118180	1530	76.5	59380	500	25	362530	4260	213	42.6
2005	187200			119710			59880			366790			
Average			101.87			70.2			23.67			195.73	39.15

Generation numbers were obtained from the County of Santa Barbara Waste Generation Study, February 1991.
 All figures are tonnages.
 Generation calculations assume a 1.2% growth rate.

18. THRESHOLDS OF SIGNIFICANCE FOR TRAFFIC IMPACTS AND CONTENTS OF A TRAFFIC STUDY

A. Introduction.

The threshold criteria and traffic report contents proposed in the following pages are intended to provide a basis for improved analyses of the potential traffic impacts of proposed projects. The criteria and report contents will also help to standardize traffic impact reports making them easier to use in the planning process. It is hoped that standardization will aid in the compilation of traffic data for use in other EIRs.

Evaluation of traffic impacts and development of proposed mitigation measures is a complex task. When a potential for significant adverse traffic impacts is evident, the traffic analysis should be performed by a registered civil engineer that is qualified to perform traffic engineering studies and is familiar with Santa Barbara County.

CEQA Guidelines, Appendix G, states that a project will ordinarily have a significant effect on the environment if it will "cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system." The following threshold criteria assume that an increase in traffic that creates a need for road improvements is "substantial in relation to the existing traffic load and capacity of the street system." It should be noted that the following criteria are guidelines for the majority of potential traffic impacts. The list of criteria is not intended to be all inclusive as the potential for impact may vary depending upon the environmental setting and the nature of the project.

B. Threshold Criteria - Significant Adverse Impact.

1. The impacts of project generated traffic are assessed against the following County thresholds. A significant traffic impact occurs when:
 - a. The addition of project traffic to an intersection increases the volume to capacity (V/C) ratio by the value provided below or sends at least 5, 10 or 15 trips to at LOS F, E or D.

LEVEL OF SERVICE (including project)	INCREASE IN V/C GREATER THAN
A	0.20
B	0.15
C	0.10
	Or The Addition Of:
D	15 trips
E	10 trips
F	5 trips

- b. Project access to a major road or arterial road would require a driveway that would create an unsafe situation or a new traffic signal or major revisions to an existing traffic signal.
 - c. Project adds traffic to a roadway that has design features (e.g., narrow width, road side ditches, sharp curves, poor sight distance, inadequate pavement structure) or receives use which would be incompatible with substantial increases in traffic (e.g., rural roads

with use by farm equipment, livestock, horseback riding, or residential roads with heavy pedestrian or recreational use, etc.) that will become potential safety problems with the addition of project or cumulative traffic. Exceedance of the roadways designated Circulation Element Capacity may indicate the potential for the occurrence of the above impacts.

- d. Project traffic would utilize a substantial portion of an intersection(s) capacity where the intersection is currently operating at acceptable levels of service (A-C) but with cumulative traffic would degrade to or approach LOS D (V/C 0.81) or lower. Substantial is defined as a minimum change of 0.03 for intersections which would operate from 0.80 to 0.85 and a change of 0.02 for intersections which would operate from 0.86 to 0.90, and 0.01 for intersections operating at anything lower.

If the above thresholds are exceeded, construction of improvements or project modifications to reduce the levels of significance to insignificance are required.

Mitigation Measures:

In order to reduce project impacts to levels of insignificance the proposed mitigations (e.g., road improvements, trip reductions) must restore affected intersections to an acceptable LOS (C) and/or reduce safety impacts to insignificance. The scope of the mitigation must reduce the project's contribution to insignificance and be timed to be implemented prior to occurrence of the impact (e.g., prior to intersection degrading to LOS D). The payment of offsite road fees in and of itself is not adequate to mitigate a project's impacts.

The thresholds of significance identified above assume full contribution to the Off-Site Road Improvement Fund. Without the fee program a much smaller increase in the V/C ratio would have to be considered significant.

2. **When a Traffic Study is Required.** A traffic study will generally be required when it appears that the thresholds of significance identified above will be exceeded. In almost all cases where trip generation during the peak hour is expected to exceed 50 vehicles a traffic study will be required.

A previous traffic study for the development under review will only be acceptable if it is less than two years old.

3. **Coordination between County Departments.** In order to ensure coordinated planning, the Planning and Development Department and the Public Works Department Road Division should discuss potential project impacts prior to sending out requests for proposal (RFP). The following items should be established prior to sending of the RFP: definition of study area, cumulative projects and intersections requiring critical movement analysis. A copy of the traffic study should be submitted for the County Traffic Engineer.

C. Contents of Traffic Study.

Some traffic studies may require information or analysis beyond what is described below; some may require less.

1. **Executive Summary.** This should be no more than two pages summarizing the project's traffic impacts, needed road improvements, and proposed changes in the project.
2. **Maps Showing the Following.**
 - a. Location of proposed project

- b. Collectors, arterials and state highways that will be used by occupants and visitors to get to and from major attractions and productions.
- c. Location of cumulative projects that will impact those roads identified in (b) and the status of those projects (e.g. Proposed, Under Review, Approved, Under Construction).
- d. Percent distribution of traffic from the proposed project and cumulative projects.
- e. Traffic volumes on road identified in (b): existing traffic, existing plus project traffic, existing plus project plus cumulative traffic (weekday ADT and PHT).

3. Tables Showing the Following.

- a. Proposed project and cumulative projects, their size and nature, trip generation rates, trip generation (ADT and PHT) and status (see item 2C)
- b. Signalized intersections, intesections with potential for signals, LOS (Existing, existing plus project, existing plus project plus approved projects, existing plus project plus full cumulative), existence of signal warrants and existence of operational problems and project specific and cumulative impacts post mitigation implementation.
- c. Roadway design features that will become potential safety problems or will be below County standards with the addition of cumulative traffic. Roadways in critical need of reconstruction.
- d. Improvements needed to correct the identified deficiencies separated by project impacts and cumulative impacts, LOS after mitigation, approximate cost and the probable or scheduled timing of each improvement, identification of specific improvements to be constructed by developer and/or a dollar contribution to be made by developer (i.e., payment to Off-Site Improvement Fund).

4. Narrative, Footnotes and Appendices Containing the Following.

- a. Sources and dates of data including persons contacted
- b. Raw traffic count data (all traffic count data must be less than two years old)
- c. Methods used and special circumstances
- d. Level of service calculations
 - 1. Peak hour turning movements and LOS (show V/C), for existing, existing plus project, existing plus project plus cumulative traffic
 - 2. Lane configuration and traffic control
 - 3. Mitigation measures proposed and effect on LOS

**CRITICAL MOVE GUIDELINE VALUES FOR ENVIRONMENTAL ASSESSMENTS
TYPICAL SIGNALIZED INTERSECTIONS
ALL PHASED OPERATIONS**

L.O.S.	Project Impact	Cumulative Impact
A	100	50
B	70	30
C	40	15
D	10	0 - 10
E	0 - 10	0 - 10

Notes:

1. Use restricted to environmental assessments only. More precise estimates are obtained by calculations changes in volume to capacity radius (V/C).
2. For all phases, the difference in critical moves between Levels of Service is approximately 150.
3. These values are guidelines only. Values should be adjusted on a project by project case if necessary.
4. No signalized intersection is typical. Use common sense.

**COUNTY INTERSECTIONS
Volume to Capacity and Level of Service (LOS)
South County**

Intersection	Existing V/C Level of Service	Existing Approved Cumulative Projects	Approved and Pending Cumulative Projects	With Improvements	Date and Source
Storke/101 NB Ramp	NA/E – F	NA/F	NA/F	Unfunded 0.68/B	10/89 89-SD-5
Storke/101 SB Ramp	NA/E – F	NA/F	NA/F	Unfunded 0.55/A	10/89 89-SD-5
Los Carneros/101 NB Ramp					
(AM)	0.49/A	0.76/C	0.98/E	Unfunded 0.47/A	10/89 89-SD-5
(PM)	0.46/A	0.55/A	0.71/C	Unfunded NA/B	10/89 89-SD-5
Los Carneros/ 101 SB Ramp	0.78/C	1.03/F	1.28/F	Unfunded NA/B-C	10/89 89-SD-5
Cathedral Oaks/ Fairview	0.44/A	--	--	--	4/85
Fairview/101 NB Ramps	0.72/C	--	--	--	4/85
Fairview/101 SB Ramps	0.81/C	--	--	--	4/85
Los Carneros/Hollister	0.61/B	0.71/C	0.87/D	Unfunded 0.79/C	10/89 89-SD-5
Hollister/San Marcos	0.60/A/B	--	--	--	5/85
Hollister/Fairview	0.88/D	0.99/E	1.15/F	Funded 0.90/D	10/89 89-SD-5
Hollister/Storke	0.64/B	0.74/C	0.87/D	Unfunded 0.74/E	10/89 89-SD-5
Hollister/Orvieto Way	0.52/A	0.54/A	--	--	10/89 89-SD-5
Hollister/217 NB Ramp	0.75/C	--	--	--	6/88 88-EIR-11
Hollister/Walnut	0.72/C	--	--	--	6/88 88-EIR-11
Patterson/101 SB Ramp	NA/E-F	NA/E-F	NA/E-F	0.59/A	6/88

Thresholds of Significance for Traffic Impacts and Contents of a Traffic Study

Intersection	Existing V/C Level of Service	Existing Approved Cumulative Projects	Approved and Pending Cumulative Projects	With Improvements	Date and Source
					88-EIR-11
Hollister/217 SB Ramp	0.64/B	0.69/B	0.73/C	--	12/88 88-EIR-22
Hollister/Ward Drive	0.75/C	0.81/D	0.86/D	0.82/D	12/88 88-EIR-22
Hollister/Patterson	0.76/C	0.82/D	0.92/E	--	12/88 88-EIR-22
Hollister/Turnpike	0.73/C	0.77/C	0.82/D	--	12/88 88-EIR-22
Calle Real/San Antonio	0.18/A	0.28/A	0.41/A	--	88-EIR-16
Calle Real/El Sueno	0.55/A	0.65/B	0.80/C	--	88-EIR-16
Calle Real/Hwy. 154	0.82/D	0.86/D	0.91/E	--	88-EIR-16
Turnpike/ Cathedral Oaks	0.75/C	--	--	--	89-EIR-8
Turnpike/101 NB	0.67/B	0.68/B	0.79/C	--	89-EIR-8
Turnpike/101 SB	0.56/A	0.58/A	0.69/B	--	89-EIR-8
Patterson/Calle Real	NA/E	--	--	0.43/A	89-EIR-8
Patterson/101 NB	1.03/F	1.09/F	1.23/F	0.50/A	89-EIR-8
Hollister/Modoc	0.75/C	--	--	--	2/88
Calle Real/Fairview	0.83/D	--	--	--	4/85
Calle Real/Turnpike	0.47/A	--	--	--	12/88
Calle Real/Las Positas	NA/C	--	--	--	3/78
Modoc/Las Positas	NA/A	--	--	--	3/78
East Valley/San Ysidro	NA/A	--	--	--	8/80
Carpinteria/Linden	NA/C	--	--	--	8/80
El Colegio/ Los Carneros	0.60/A-B	--	--	--	10/84

COUNTY INTERSECTIONS
Volume to Capacity and Level of Service (LOS)
North County

Intersection	Existing V/C Level of Service	Existing Approved Cumulative Projects	Approved and Pending Cumulative Projects	With Improvements	Date and Source
Clark Ave./ Frontage	0.34/A	--	--	--	8/84
Clark Ave./ Rt. 135 NB	0.48/A	0.55/A	0.67/B	--	1/90 90-EIR-1
Clark Ave./ Rt. 135 SB	0.41/A	0.47/A	0.60/A	--	1/90 90-EIR-1
Clark Ave./ Orcutt Rd.	0.47/A	0.50/A	0.57/A	--	1/90 90-EIR-1
S.R. 246/ Alamo Pintado	B	--	--	--	--
S.R. 246/ Alisal	0.59/A-B	--	--	--	3/85
Bradley Rd./ Clark Ave.	0.56/A	0.71/C	0.96/E	--	1/90 90-EIR-1
Bradley Rd./ Foster Rd.	0.41/A	0.52/A	--	--	88-EIR-13

Thresholds of Significance for Traffic Impacts and Contents of a Traffic Study

Intersection	Existing V/C Level of Service	Existing Approved Cumulative Projects	Approved and Pending Cumulative Projects	With Improvements	Date and Source
Bradley Rd./ Santa Maria Way	0.54/A	--	--	--	
Broadway/Betteravia	E	--	--	--	1980
Broadway/Main St.	D/E	--	--	--	1975
Rte. 135/Foster Rd.	0.73/C	0.96/E	1.33/F	--	1/90 90-EIR-1
Bradley Rd./ Rice Ranch Rd.	0.24/A	0.24/A	0.25/A	--	3/90 90-EIR-1
Clark Ave./ Stillwell Rd. (E)	0.56/A	0.65/B	0.85/D	--	3/90 90-EIR-1
Clark Ave./ Stillwell Rd. (W)	0.43/A	0.50/A	0.68/B	--	3/90 90-EIR-1
Clarke Ave./ Hwy.101 NB Ramp	0.51/A	0.57/A	0.70/B	--	3/90 90-EIR-1
Clarke Ave./ Hwy.101 SB Ramp	0.59/A	0.70/B	0.92/E	--	3/90 90-EIR-1
Bradley Rd./ Patterson Rd.	0.59/A	0.80/C	1.10/F	--	9/89 89-SD-4
Clark Ave./Hwy. 101 NB Ramp	0.51/A	0.58/A	0.71/C	--	9/89 89-SD-4
Clark Ave./Hwy. 101 SB Ramp	0.59/A	0.70/B	0.92/E	--	3/90 90-EIR-1
Bradley Rd./ Foster Rd.	0.41/A	0.59/A	0.79/C	--	9/89 89-SD-4
Route 135/Main St.	0.76/C	1.27/F	--	1.11/F	88-EIR-13
Route 135/Cook	0.67/B	--	--	--	88-EIR-13
Miller St./Main St.	0.75/C	1.10/F	--	1.01/F	88-EIR-13
Miller St./Cook	0.52/A	0.93/E	--	--	88-EIR-13
Foster/Bradley	0.41/A	0.52/A	--	--	88-EIR-13
Foster/ California Blvd.	0.49/A	NA/B-C	--	--	88-EIR-13
Clark Ave./ Broadway St.	0.29/A	0.38/A	--	--	89-ND-64
Blosser Rd./ Foster Rd.	*/A	*/A	--	--	89-ND-64
Blosser Rd./ Clark Ave.	*/A	*/A	--	--	89-ND-64
Blosser Rd./ Solomon Rd.	*/A	*/A	--	--	89-ND-64
Solomon Rd./Hwy. 1	*/A	*/A	--	--	89-ND-64

19. VISUAL AESTHETICS IMPACT GUIDELINES

A. Determinations of Significance.

The classification of a project's aesthetic impacts as beneficial or adverse, and insignificant or significant, is clearly subject to some personal and cultural interpretation. However, there are guidelines and policies which can be used to direct and standardize the assessment of visual impacts. Thus, this discussion does not constitute a formal significance threshold, but instead it directs the evaluator to the questions which predict the adversity of impacts to visual resources.

B. Assessing Visual Impacts.

Assessing the visual impacts of a project involves two major steps. First, the visual resources of the project site must be evaluated. Important factors in this evaluation include the physical attributes of the site, its relative visibility, and its relative uniqueness. In terms of visibility, four types of areas are especially important: coastal and mountainous areas, the urban fringe, and travel corridors.

Next, the potential impact of the project on visual resources located onsite and on views in the project vicinity which may be partially or fully obstructed by the project must be determined. To some extent, the former step is more important in rural settings, and the latter in urban areas. Determining compliance with local and state policies regarding visual resources is also an important part of visual impact assessment.

Significant visual resources as noted in the Comprehensive Plan Open Space Element which have aesthetic value include:

- Scenic highway corridors
- Parks and recreational areas
- Views of coastal bluffs, streams, lakes, estuaries, rivers, water sheds, mountains, and cultural resource sites
- Scenic areas.

All views addressed in these guidelines are public views, not private views.

C. Initial Study Assessment Questions for the Analysis of Visual Resources.

CEQA Guidelines Appendix G (b) states: "A project will normally have a significant effect on the environment if it will have a substantial, demonstrable negative aesthetic effect". The following questions are intended to provide information to address the criteria specified in Appendix G. Affirmative answers to the following questions indicate potentially significant impacts to visual resources.

- 1a. Does the project site have significant visual resources by virtue of surface waters, vegetation, elevation, slope, or other natural or man-made features which are publicly visible?
- 1b. If so, does the proposed project have the potential to degrade or significantly interfere with the public's enjoyment of the site's existing visual resources?
- 2a. Does the project have the potential to impact visual resources of the Coastal Zone or other visually important area (i.e., mountainous area, public park, urban fringe, or scenic travel corridor)?
- 2b. If so, does the project have the potential to conflict with the policies set forth in the Coastal

Land Use Plan, the Comprehensive Plan or any applicable community plan to protect the identified views?

3. Does the project have the potential to create a significantly adverse aesthetic impact through obstruction of public views, incompatibility with surrounding uses, structures, or intensity of development, removal of significant amounts of vegetation, loss of important open space, substantial alteration of natural character, lack of adequate landscaping, or extensive grading visible from public areas?

REFERENCES.

1. Scenic Highway Element of the County Comprehensive Plan, 1982.
2. Open Space Element of the County Comprehensive Plan, 1979.
3. Coastal Land Use Plan, January 1982.
4. United States Forest Service, Visual Management System, 1973.
5. Geological Survey Circular 620, Quantitative Comparison of Some Aesthetic Factors Among Rivers, 1969.
6. U.S. Dept. of Agriculture, Agriculture Handbook 478, National Forest Landscape Management, Vol. 2, Chap. 2, Utilities, July 1975.
7. Viohl, Richard C., Nieman, Thomas J., The Description, Classification, and Assessment of Visual Landscape Quality, School of Landscape Architecture, S.U.N.Y. College of Environmental Science and Forestry, Syracuse N.Y., 13210, Exchange Bibliography #1064, Council of Planning Librarians.

APPENDIX A

Santa Barbara County Planning and Development Department Biological Resources Guidelines Technical Background Document September 1994

Synopsis:

As an appendix to the Biological Resources Guidelines (September 1994) of the County Environmental Thresholds and Guidelines Manual, this document provides additional technical background information about biological resources, which may be useful when evaluating development proposals for impacts on vegetation, wildlife, and biological habitats.

Contents:

	Page
A. Summary of Biological Resource Statutes	A-1
B. Biological Survey Guidelines	A-5
C. Biological Habitat Descriptions and Project Design Suggestions	A-9
D. Biological Mitigation Measures	A-17

A. Summary of Biological Resource Statutes (September 1994)

The Biological Resources Guidelines provides a short summary of legal authority under the California Environmental Quality Act (CEQA) for evaluating biological resource impacts, and Federal, State and County requirements and polices for the protection of biological resources.

Following are additional excerpts describing the statutory basis for the protection of individual plant and animal species, and biological habitats.

1. The legal basis for protection of threatened, endangered and candidate species.

The following text is excerpted from a "Revised Memorandum of Law Demonstrating Continuing Compliance by the State of California with USC Section 1535(c) of the Federal Endangered Species Act of 1973", originally prepared in 1974 by Evelle Younger, Boronkay and Mok with revisions made by John K. Van de Kamp, Attorney General of California and others in 1990.

"The authority of the state to conserve resident species of fish, wildlife or plants determined by the state agency to be endangered or threatened is granted in the Federal Endangered Species Act (ESA) 16 USC section 1535(c)(1)(A) and (2) (A).

California Fish and Game Code Section 200 grants general authority to the Fish and Game Commission to regulate the taking or possession of birds, mammals, fish, amphibians and reptiles subject to more specific statutory restrictions...."

a. Regulations and statutory authority. "Important state authority for the conservation of endangered and threatened species of fish, wildlife and plants is found in California Endangered Species Act (CESA) enacted in 1984. California Fish and Game Code Section 2051 et seq. ... In addition for a complete picture the California Endangered Species Act (CESA) must be read with the Native Plant Protection Act (California Fish and Game Code Section 1900 et seq.) which also governs the preservation, protection and enhancement of

endangered or rare native plants...."

- b. California Endangered Species Act (California Fish and Game Code Sections 2051 et seq.)** "This important conservation legislation declares State policy regarding threatened and endangered species, provides for a listing and review process, prohibits certain acts damaging to listed species, and provides a consultation process whereby state projects are reviewed for impacts on listed species. Both the Commission and Department are given important powers and duties vis-à-vis protection of subject species.

The CASE declares the State's interest in threatened and endangered species (California Fish and Game Code Section 2051) and unequivocally sets out the State's policy in California Fish and Game Code Section 2052:

"The Legislature further finds and declares that it is the policy of the state to conserve, protect, restore, and enhance any endangered species or any threatened species and its habitat and that it is the intent of the Legislature, consistent with conserving the species, to acquire lands for habitat for these species."

Toward that end state agencies in approving projects are required to seek out feasible alternatives to avoid jeopardizing the continued existence of listed species or provide appropriate mitigation and enhancement measures. California Fish and Game Code Sections 2053 - 2054. The California thresholds for endangered and threatened status (California Fish and Game Code Sections 2062 and 2067) are equivalent to Federal definitions. See 16 USC Sections 1532(6) and 1532(20). Also the tools listed for "conserving" resources (California Fish and Game Code Section 2061) are identical to the federal model. 16 U.S.C. Section 1532(3)."

"...Species to be so conserved must first be listed. That responsibility rests with the Fish and Game Commission upon consideration of sufficient scientific information. California Fish and Game Code Section 2070. The listing process may be initiated by petition from any interested person (California Fish and Game Code Section 2071, 2072 and 2072.3) or on recommendation of the Department of Fish and Game (California Fish and Game Code Section 2072.7. Petitions are evaluated by the Department which makes a recommendation to the Commission as to whether the petition contains sufficient information to determine if action is warranted. California Fish and Game Code Section 2073.5. Petitions and Department-initiated recommendations are then acted upon by the Commission, which decides whether to require formal review of the request. California Fish and Game Code Section 2074.2. Formal review and the corresponding "candidate species" status triggers substantial opportunities for public participation through the notification of interested parties. See California Fish and Game Code Section 2074, 2074.2, 2075, 2077 and 2078. This notification and opportunity to participate continues throughout the designation process. Formal review itself may take up to one year and results in a Department report on listing including, if appropriate, a preliminary identification of the habitat that may be essential to the continued existence of the species and recommendation as to management activities and other recommendations for recovery of the species. California Fish and Game Code Section 2074.6."

"Currently California's list of threatened or endangered plants and animals is set out in 14 Section Code Choosy. Sections 670.2 and 670.5. This listing is subject to periodic Department review and appropriate Commission response. California Fish and Game Code Section 2077...."

"Once a species is listed "[N]o person shall import into this state, export out of this state, or take, possess, purchase, or sell within this state, any species, or any part or product thereof, that the Commission determines to be an endangered species or a threatened species, or attempt any of those acts," subject to some exceptions principally involving plants. California Fish and Game Code Section 2080....**This prohibition generally applies to candidate species undergoing formal review.** [emphasis added] California Fish and Game Code Section 2085..."

"In the event a project is being carried out by a local agency the Department [of Fish Section Game] may participate in the environmental review process as a responsible or trustee agency as appropriate. In that regard the status of threatened or endangered is recognized in the environmental review process (14 Section Code Choosy. 15380) and a project impact is normally considered significant, thus requiring the consideration of alternatives and mitigation, if a project will substantially affect a threatened or endangered species of animal or plant or the habitat of the species. 14 Section Code Choosy. Causa. 6, Chap. 3, Cheesy. G(c)."

"The Native Plant Protection Act [California Fish and Game Code Section 1900 et seq.] provides further authority to conserve plant species and conduct investigations in support of conservation in accordance with 16 U.S.C. sections 1535(c)(2)(A)(C).

- c. **Wildlife and Natural Areas Conservation Act (California Fish and Game Code Section 2700 et seq.).** This legislation became effective November 9, 1988 and provides money for habitat protection for California species including those designated as threatened or endangered. California Fish and Game Code Section 2701. The principal protection focus is acquisition...."

"California Fish and Game Code Section 1700 et seq., entitled "Conservation of Aquatic Resources," declares State policy to encourage conservation of the living resources of the ocean and other state waters, including species preservation.

Similarly California Fish and Game Code section 1750 et seq. (Native Species Conservation and Enhancement Act) declares a policy of maintaining sufficient populations of all species of wildlife and native plants and the habitat necessary to insure their continued existence at optimum levels and establishes an account to manage private donations toward that end....California Fish and Game Code Section 1800 et seq. provides that the policy of the State, inter alia, is "to encourage the conservation and maintenance of wildlife resources" including the maintenance of "sufficient populations of all species of wildlife and the habitat necessary to ...perpetuate all species of wildlife for their intrinsic and ecological values...." Lastly, California Fish and Game Code Sections 1930-1933 establishes the significant natural areas program to protect and preserve important habitats and ecosystems through developing information with respect to natural resources (the California Natural Diversity Data Base)....[and other mechanisms]."

- d. **Public Resources Code.** "California Public Resources Code Section 21000 et seq. was [enacted] in 1970 as the [California] Environmental Quality Act of 1970 (CEQA), to promote the declared legislative intent to maintain a quality environment including the protection of natural resources.

Section 21001(c) of the code provides that it is the policy of the State to "Prevent the elimination of fish or wildlife species due to man's activities, insure that fish and wildlife

populations do not drop below self-perpetuating levels, and preserve for future generations representations of all plant and animal communities and examples of the major periods of California history."

The Act goes on to provide for an environmental impact report, similar to the provisions in the National Environmental Policy Act of 1969 and for the preparation of environmental impact reports by all local agencies, state agencies, boards, and commissions on any project which would have a significant effect on the environment."

- e. **California Coastal Act.** "California Public Resources Code Section 30000 et seq. was added by statute in 1976 as the California Coastal Act. The act sets out various policies protecting marine and land resources including species and habitat. To this end, the California Coastal Commission was established to regulate development with local government along the coast to insure that development will be consistent with conservation policies."
- f. **Authority and jurisdiction over wetlands.** The Federal Clean Water Pollution Control Act of 1972, ("Clean Water Act") requires a permit for the discharge of pollutants into the waters of the United States. The Clean Water Act defines pollutants to include dredge and fill materials (33 U.S.C. S 1362). Section 404 of the Clean Water Act authorizes the Army Corps of Engineers to issue permits to discharge dredge and fill materials into waters of the United States (33 U.S.C. S 1344(a). Federal Regulations define waters of the United States to include wetlands (33 CFR S 328.3(a)(7).

Due to the widely recognized high economic and biologic value of wetlands, the California Coastal Act mandates governmental regulation of these areas. The Act requires that the biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes be maintained and, where feasible, restored. Sections of the Act provide general policies for development in and adjacent to wetlands, and specific policies for protecting these areas (California Coastal Commission, 1981).

Fish and Game Sections 1601 and 1603 prohibit any person or governmental agency, or public utility from substantially diverting or obstructing the natural flow or substantially change the bed, channel or bank of any river, stream or lake designated by the department, or use any material from the streambeds without obtaining the appropriate permit from the California Department of Fish and Game.

It is generally advisable to consult with representatives of these agencies prior to submittal of an application to the County, so that impacts to Wetlands and Deepwater Habitats are avoided or minimized to the greatest extent feasible.

- 2. **The legal basis for the protection of habitats.** California Fish and Game Code Section 1750 et seq. (Native Species Conservation and Enhancement Act) declares a policy of maintaining sufficient populations of all species of wildlife and native plants and the habitat necessary to ensure their continued existence at optimum levels.

California Fish and Game Code Section 1800 et seq. states that it is the policy of the state "to encourage the conservation and maintenance of wildlife resources" including the maintenance of "sufficient population of all species of wildlife and the habitat necessary to ... perpetuate all species of wildlife for their intrinsic and ecological values...."

Furthermore, CEQA (Public Resources Code section 21000(c) states that it is the policy of the state to: "...prevent the elimination of fish or wildlife species due to man's activities, ensure

that fish and wildlife populations do not drop below self-perpetuating levels, and preserve for future generations representations of all plant and animal communities and examples of the major periods of California history."

CEQA Appendix G, items (c), (d), and (t) specifically mention or refer to habitat.

The California legislature has further recognized the need to conduct habitat-based land use planning through adoption of the *Natural Community Conservation Planning Act of 1991 (NCCP)* (California Fish and Game Code Section 2800 et. seq.). The purpose of this Act is to provide for regional protection and perpetuation of natural wildlife diversity while allowing compatible land use and appropriate development and growth. The NCCP process is designed to provide an alternative to current "single species" conservation efforts by formulating regional, natural community-based habitat protection programs to protect the numerous species inhabiting each of the targeted natural communities.

In 1986, the U.S. District Court for Hawaii (*Palila v. Hawaii Department of Land and Natural Resources and Sportsmen of Hawaii*, 649 F.Supp.1070 [1986] (*Palila II*)) issued a ruling regarding destruction of habitat of an endangered bird known as "Palila" in the State of Hawaii. Regarding the term "harm" within the definition of "take" of the Federal Endangered Species Act, the Court concluded:

"A finding of "harm" does not require death to individual members of the species; nor does it require a finding that habitat degradation is presently driving the species further toward extinction. Habitat destruction that prevents the recovery of the species by affecting essential behavioral patterns causes actual injury to the species and effects a taking under Section 9 of the Act."

"The key to the Secretary's [of the Interior] definition is harm to the species as a whole through habitat destruction or modification. If the habitat modification prevents the population from recovering, then this causes injury to the species and should be actionable under Section 9."

See also *Sierra Club v. Lyng*, 694 F.Supp.1260 (E.D. Tex. 1988) and *Sierra Club v. Yeutter*, 926 F.2d 429 (5th Cir.1991). Further discussion of habitat protection under the Endangered Species Act is provided by Sidle and Bowman (1988).

B. Biological Survey Guidelines.

- 1. Initial assessment of biological resources (Initial Studies, EIRs and Mitigated NDs).** During the overall land use permit process, an on-site inspection is conducted by the Planning and Development Department to determine if critical or sensitive biological resources may be impacted by a proposed project. Should the on-site investigation indicate the presence, or a high potential for the presence, of critical or sensitive biological resource, a biological survey may be required, pursuant to CEQA Section 15064 (Determining Significant Impacts). The biological survey could be completed as part of an EIR or it could be used to develop a Mitigated Negative Declaration as provided for by CEQA Section 15070:
 - a. The Initial Study shall be used to provide a written determination of whether a Negative Declaration or an EIR shall be prepared for a project.
 - b. Where a project is revised in response to an Initial Study so that potential adverse effects are mitigated to a point where no significant environmental effects would occur, a Negative Declaration shall be prepared instead of an EIR. If the project would still result in one or

more significant effects on the environment after mitigation measures are added to the project, an EIR shall be prepared.

- c. The EIR shall emphasize study of the impacts determined to be significant and can omit further examination of those impacts found to be clearly insignificant in the Initial Study.

Biological survey reports are conducted and written by professional biologists under contract to the County. Payment for the study is accomplished by a deposit with the County from the applicant in an amount equal to the cost estimate of the consulting biologist. In some cases, work is performed by a Planning and Development Department-qualified biologist under contract to the applicant.

All biological surveys are subject to review and acceptance by Planning and Development Department staff and may require reexamination by an outside consulting biologist acceptable to the Planning and Development Department. If a disagreement among experts occurs, review by an independent biologist may be required.

In a majority of cases, applicants work with the staff of the Development Review Division to modify the project design for the purpose of reducing impacts to biological resources to an acceptable level. Project design modifications, with the applicant's consent, then become a part of the project description and the basis for issuing a Mitigated Negative Declaration. However, if design modifications are not acceptable to an applicant, then additional biological analysis (and possibly development of additional mitigation measures) would be required as a component of an EIR pursuant to the above citation from CEQA.

2. **Qualifications to perform the biological survey.** Biological consultants must be on the Planning and Development Department list of qualified biologists or on staff of a Planning and Development Department-qualified consulting firm or otherwise be acceptable to Planning and Development Department. A file is retained in the Planning and Development Department which tracks the performance of each consultant. Consultants should be selected on the basis of possessing objectivity and the following qualifications, in order of importance:
 - a. A BA/BS in biological sciences or other degree specializing in the natural sciences.
 - b. Professional or academic experience as a biological field investigator, with a background in field sampling design and field methods;
 - c. Taxonomic experience and a knowledge of plant or animal (whichever is appropriate) ecology;
 - d. Familiarity with plants, animals, or both (whichever is appropriate) of the area, including the species of concern; and
 - e. Familiarity with the appropriate county, state and federal policies related to special status species and biological surveys.
 - f. In addition, the County of Santa Barbara requires that a consultant, hired to perform a biological survey, presently has no interest and shall not acquire any interest, direct or indirect, which would conflict in any manner or degree with the performance of services required to be performed. Therefore, to avoid a real or perceived appearance of a conflict of interest, a biological survey submitted by a consultant shall be subject to verification of the Planning and Development Department staff biologists or a third outside consulting biologist.

- 3. Guidelines for preparation of biological survey reports.** These guidelines were prepared by James R. Nelson, a botanist with the California Energy Commission, published in its original form by the California Department of Fish and Game (1984) and supplemented by Planning and Development Department staff in consultation with local biologists.
- a. When to conduct a biological survey.** It is appropriate to conduct a biological field survey to determine if, or the extent to which, sensitive plants or animals or a habitat of concern will be affected by a proposed project when:
- (1) Based upon an initial biological assessment, it appears that the project may damage potential special status plant or animal habitats;
 - (2) Special status species have historically been identified on the project site and adequate information for impact assessment is lacking; or
 - (3) No initial biological assessment by the Planning and Development Department biologist has been conducted and it is not known which habitats or the quality of habitats exist on the site, nor what the potential impacts of the project may be.
- b. Guidelines and goals of the biological survey.** Biological surveys that are conducted to determine the environmental impacts of development activities should include particular attention to all rare, threatened, and endangered species and habitats. The species and habitats are not necessarily limited to those that have been "listed" by state and federal agencies, but include any species that, based upon all available data, can be shown to be rare, threatened and/or endangered. These can include "federal candidate" species, "state special concern" species, and those of local concern such as those species which are endemic, rare in the region, or declining in number.

Field searches should be conducted in such a manner that they will locate any listed or special status plant or animal species that may be present/a resident or that may utilize the site on a seasonal rather than year-round basis. Specifically:

- (1) Investigations should be conducted at the proper season and time of day when special status species are both evident and identifiable. Field surveys should be scheduled to coincide with known flowering periods, and/or during periods of phenological development that are necessary to identify plants of concern, and during periods critical to the species such as nesting for birds or larval development for amphibians.
- (2) Investigations should be both predictive in nature and based upon field inspection. Surveys should predict the presence of rare plants and animals (which may not be present every year or which may use it infrequently) based upon the occurrence of habitats or other physical features, in addition to actual field observation. The survey should not be limited to a description of those species that are actually observed in the field. Every species noted in the field should be identified to the extent necessary to ensure that it is neither a listed nor special status species.
- (3) Investigations should be conducted in such a manner that they are consistent with conservation ethics. Collections of voucher specimens or rare (or suspected rare) plants or animals should be made only when such actions do not jeopardize the continued existence of the population and in accordance with applicable state and federal regulations. All voucher specimens should be deposited at local public herbaria or recognized museums of natural history for proper storage and future reference. Photography should be used to document plant identifications and habitat

whenever possible, especially when rare plant populations cannot withstand collection of vouchers.

- (4) Investigations should be conducted using systematic field techniques in all habitats of the site to ensure a reasonably thorough coverage of potential impact areas.
- (5) Investigations should be well-documented. When rare or endangered plants or animals or unusual plant communities are located, a California Native Plant Field Survey Form or its equivalent must be completed and sent to the Natural Diversity Data Base and a copy attached to the report sent to the Planning and Development Department.

c. Contents of the biological survey. Reports of biological field surveys and reports must contain the following information with the exception of items 10 through 12 which are recommended for inclusion but may not be necessary in all cases.

- (1) A detailed map of the project regional location and specific study area;
- (2) A written description of the biological setting, referencing the plant community and a detailed map of the vegetation and/or animal habitat areas.
- (3) A detailed description of the survey methodology;
- (4) The dates and times of field visits;
- (5) An assessment of all potential direct and indirect impacts;
- (6) A discussion of the status, distribution, and habitat affinities of all special status plants or animals found at the project site;
- (7) A discussion of the quality of the habitat considering: its ability to support species diversity, its ability to be self-sustaining (in the context of the surrounding area, not just the project boundaries), how common or rare it is (see Table 3 for example), how good a representative it is (plant community), the degree of previous disturbance, and other history of the site, etc.
- (8) Recommended mitigation measures to reduce impacts to the maximum extent feasible and to protect the resource(s) by considering a range of possibilities, including: avoidance, fencing, open space easements, clustering and off-site mitigation;
- (9) Suggestions for monitoring and evaluating the effectiveness of the mitigation measures;
- (10) Solutions which, when feasible, work toward regional protection of the resources, including: combining open space easements with adjacent ownerships, maintenance of open space corridors; attempting to preserve as much contiguous habitat as possible;
- (11) Recommended methods for the restoration of damaged habitats, where appropriate and feasible, and suggested success criteria to be achieved at the end of the proposed monitoring period;
- (12) A list of all listed or special status plant or animal species observed or expected to occur on site. A list of additional species observed or expected should also be included. This may be representative of the communities present rather than exhaustive. Division by taxonomic group is not necessary.

- (13) Copies of all Natural Diversity Data Base Field Survey Forms sent to Sacramento and Natural Community Field Survey Forms, for sensitive species or communities found on the project site;
- (14) The name(s) of the field investigator(s); and
- (15) A list of references cited, persons contacted, herbaria and museums visited, and the location of voucher specimens.

C. Biological habitat descriptions and project design suggestions.

The following provides brief descriptions of some, though not all, of the habitats occurring in Santa Barbara County, an explanation of the habitat's importance, and project design suggestions for minimizing impacts to habitats, as well as individual plant and animal species. These habitats are by no means the only priority habitats in the County, rather, they represent the habitats where conflicts with land use developments most often occur.

- 1. Wetlands.** All naturally occurring wetlands are considered significant resources because they provide a high number of functional values in a generally dry, arid region, and because of their extremely rare occurrence within the region. Examples include, but may not be limited to coastal salt and brackish marshes, fresh water marshes and vernal pools.

Wetlands, due to the presence of water, support the most diverse assemblages of plants and animals found in the southwestern United States. Because of the high biological productivity in wetlands and the historic elimination of 90 percent of California's wetlands, the highest numbers of threatened and endangered species most often occur here. Wetlands are utilized by a large number of organisms including invertebrate larvae, large mammals and plants that may only survive in wetland areas. Wetlands provide food, cover for protection against predators, and habitat for breeding of some species. Because Santa Barbara County is located along the Pacific Flyway, the County not only has a diverse resident bird population, but also those migrating birds that over-winter in Santa Barbara County (migrants). Wetlands provide seasonal and year-round habitat to several migrating bird species along the Pacific Flyway and fish utilize some of these areas as spawning and foraging habitat.

Wetlands also provide a number of public benefits¹ including: 1) protection of the shore from erosion (typically applicable to marshes, sloughs, and other estuaries), 2) Water Quality/Hydrology which support groundwater recharge, surface water availability, and water purification/filtration, 3) food chain support, 4) nutrient cycling, and 5) Socio-Economic benefits which include aesthetics, ethno-botany, recreation, research, education, economic benefit, etc.

a Coastal Salt Marsh

- (1) Description.** Coastal salt marshes are restricted to the upper intertidal zone of protected shallow bays, estuaries, and coastal lagoons. Physical conditions are dominated by the tides and variances in elevation which influence the frequency and duration of tidal flooding. The harsh, tidal environment of a salt marsh results in zones of different indicator plants. The environment includes tidal inundations of salt or brackish water, water-saturated soils containing few air spaces and hence reduced oxygen levels, and an environment fully exposed to sun, wide temperature fluctuations, wind, etc. The lowest zone is inundated twice daily; whereas the middle

¹ Bowland and Ferren (1992), and Sather and Smith (1984)

or upper zones may be inundated only once or twice a month, or even by only the highest spring tides (Faber, 1982).

Because tides are so important in providing moisture for coastal marshes, any interruption in tidal circulation can have drastic effects on these communities. The total area of marsh habitat may be correlated with the tidal prism (the total volume of water moving in and out of the slough\marsh\lagoon, etc). As tidal prisms are reduced through sedimentation due to urban and agricultural development or for road construction, the likelihood of closure at the mouth increases. This event can change the soil and water salinity and water levels. This in turn affects many salt-tolerant plants adapted to this type of environment and convert salt-marsh habitat to upland habitats available to species such as the Beldings Savannah sparrow. Additionally, wildlife species such as the tidewater goby, depend on brackish waters to survive.

In addition to sedimentation, increases of fresh water inputs into the system due to urban and agricultural runoff may reduce salinity levels, while upstream dams may have the opposite effect. This runoff may also introduce toxic elements into the marsh such as fertilizers, septic effluent, pesticides, oil, grease, etc. Other potential impacts include changes in depth of enclosed water, elevated temperatures and decreased oxygen from algal blooms often associated with high nitrogen levels from polluting sources. These changes can alter the number and diversity of wildlife species. (Zedler, J. 1982). Development adjacent to the area could also disrupt wildlife behavioral patterns due to noise, neighboring domestic dogs and cats and other physical disturbances.

(2) Project design suggestions

- (a) Maintain tidal prism.
- (b) Minimize adverse hydrologic changes, sedimentation, and introduction of any toxic elements.
- (c) Timing of construction activity should be carefully planned to minimize indirect impacts such as noise and turbidity on sensitive animal species during critical periods such as breeding and nesting.
- (d) Maintain wildlife dispersal corridors.
- (e) Enhancement and restoration of salt marshes that can be incorporated into the project include: removal of existing fill, improving tidal circulation through grading, channel excavation, or removing other impediments to circulation, and cleanup.

b. Vernal Pools and associated features

- (1) **Description.** Vernal pools are perhaps the most unique, rare, and endangered type of wetlands in California according to a number of studies cited in the Ferren and Pritchett 1988 report (p. 3). In fact, these wetlands are found only in a few places in the world outside California, namely southern Oregon and in the Cape Province of South Africa (Faber, P. 1982).

A vernal pool is a small depression that fills with water during the winter (gradually drying during the spring and becoming completely dry in the summer) and supports a unique assemblage of plants.

V.L. Holland and David Keil (1990) add: "Vernal pool vegetation is characterized by herbaceous plants that begin their growth as aquatic or semi aquatic plants and make a transition to a dry-land environment as the pool dries. This generally results in the development of concentric rings of vegetation that develop around the margins of the drying pool. Most vernal pool plants are annual herbs. The relatively few perennial species grow from deeply seated rhizomes or rootstocks. Shrubs and trees are absent from vernal pool communities. Some species from vernal pool communities have very showy flowers and act as aspect dominants."

"Vernal Flat" is used to describe areas that are not easily definable as discrete basins (vernal pools) and whose wetland/upland affiliations fluctuate corresponding to changing precipitation trends from year to year. Following several years of average to above-average rainfall, these tend to support vernal pool species and exclude upland species. Following several years of low rainfall, these areas tend to be characterized by upland species (Olson, 1992).

"Swales" are low moist areas, that when associated with vernal pools, may support vernal pool species including invertebrates (for example: U.S. Fish Section Wildlife Service, 1992). They may also be important because they transport rain water to a vernal pool or complex of pools.

Wildlife species, such as the Western Spadefoot Toad and California Tiger Salamander utilize these seasonal wetlands for breeding and egg-laying during the first rains of the year (December through April). The Tiger Salamander can spend several months in the larval stage, metamorphosing to adult salamanders as late as May through August when the pools dry up and then dispersing to rodent burrows in adjacent grassland areas. Spadefoot toads breed later in the year than tiger salamanders (March through April) and are dependent upon grass pollen and other vegetation for food and to conserve moisture during the tadpole stage. This species also metamorphoses to adults and disperses to surrounding rodent burrows in adjacent grasslands. Furthermore, other amphibians utilize these seasonal ponds as habitat.

Direct and indirect impacts to the pool itself may result in adverse changes to either the physical or chemical properties of the pool. Impacts to the watershed or community in which it functions may also impact the pool. For example, fragmentation of habitat may interrupt interaction between the habitat and the organisms within the pools (pollination, seed, invertebrate and vertebrate dispersal, provision of drinking and bathing water, etc.).

(2) Project design suggestions.

- (a) Because vernal pools do not exist by themselves as isolated units, and instead function within a larger plant community such as a grassland, the surrounding upland habitat should be preserved to the maximum degree feasible. If the vernal pools occur in a dispersed pattern throughout an upland community, the entire community should be preserved as one unit.
- (b) Design developments to provide a buffer around all vernal pools (with the possible exception of artificially created pools), or include enough of a buffer to protect the topographic watershed, whichever is greater. Typical buffer area: 100-250 feet from edge of pool.

- (c) Vernal Pool "complexes" (groupings of several pools have swales according to hydrology and topography) should be avoided and buffered (minimum of 100 feet) or enough of a buffer to protect the topographic watershed of the entire complex, whichever is greater.
- (d) Restoration and enhancement can include removal of exotic (non-native) species, planting of appropriate native species (seeding), removal of fill, relocation of foot and bike paths around rather than through the pools, etc.
- (e) Disturbance to vernal pools or vernal pool complexes should be timed to avoid breeding seasons of sensitive wildlife species.

c. Riparian Habitats

- (1) **Description.** Riparian habitat is generally considered as the terrestrial or upland area adjacent to freshwater bodies, such as the banks of linear watercourses (e.g.: creeks and streams), the shores of lakes and ponds, and aquifers which emerge at the surface such as springs and seeps (Bowland and Ferren 1992). The habitat is typically thought of as a corridor from stream bank to bank (from edge of riparian vegetation to edge of riparian vegetation) which may include a wetland portion in the center.²

Riparian habitat occurs in and along the County's four major rivers (Santa Ynez, Santa Maria, Cuyama and Sisquoc) and in and along the County's many creeks and streams. This habitat can also occur along arroyos and barrancas, and other types of drainages throughout the County.

Riparian habitat is particularly rich in wildlife species, in that water is present at least during some part of the year in these corridors and the dense plants of varying heights provide a diverse food source and safety from predators. In particular, riparian habitat provides forage, cover, water, migration and fawning for Santa Barbara County's resident deer herd. Various types of cover are required by deer including protective cover, for fawning, feeding and resting, escape cover from predators, and thermal cover to provide temperature regulation in the winter and summer. Riparian habitats typically provide all these habitat requirements. Deer also require a variety of food types in their diet, depending upon the time of year and will utilize oak woodlands, chaparral and grasslands adjacent to riparian corridors in order to obtain a sufficient diet. The shade of bank side vegetation can keep a stream cold enough for migratory sport fish such as steelhead trout.

Less obvious species that utilize the riparian corridors are the amphibians that require plunge pools in which to reproduce, seek protection from predation and maintain a constant body temperature. Pool and riffle sequences within streams and creeks are necessary for successful spawning for many species of fish. Specialized bird species such as Cooper's hawks and a great variety of songbirds utilize riparian habitat for breeding, nesting and foraging due to the diversity of structural heights and continuity of vegetation along the drainages.

- (2) **Project design suggestions.**

- (a) Incorporate into project design a vegetated buffer from the upland edge of the

² The Cowardin classification system does not use the term "riparian". Cowardin categories for riparian systems are palustrine and riverine.

riparian canopy at least 50 feet in width.

- (b) Inclusion of adjacent upland vegetation in the buffer. Upland vegetation is important as habitat for a large number of species, particularly amphibians,³ and also aids in stabilizing the banks, which reduces erosion and sedimentation potential.
- (c) Retain animal dispersal corridors, including the understory.
- (d) Construction activity can be planned to avoid critical time periods (nesting, breeding) for fish and other wildlife species.
- (e) Careful siting of some projects such as bridges and pipelines can limit the disturbance area to previously disturbed locations.
- (f) Restoration or enhancement of riparian habitat on a project site can enhance the ecological value of the creek, stream, or river, both upstream and downstream.

2. Chaparral. Chaparral is composed mainly of woody, evergreen shrubs. It forms extensive shrub lands that occupy most of the hills and lower mountain slopes of Santa Barbara County and throughout California. It is adapted to drought and fire, passing through cycles of burning and re-growth approximately every 30 years. Even though chaparral has no commercial value, it provides the most highly valued watershed cover of any vegetation community in the state (Hanes, 1977). Chaparral occurs throughout Santa Barbara County and is further broken down into a number of categories.

a. Burton Mesa Chaparral.

(1) Description. Central Maritime Chaparral, also known as Sandhill or Burton Mesa Chaparral is a unique form of chaparral that is restricted to the aeolian sands of the Orcutt soils formation north of Lompoc. Many of the species unique to Burton Mesa Chaparral are narrowly restricted in distribution (Odion, Storrer and Semonsen 1993, Ferren et. al 1984, Smith 1976, Dames and Moore 1985). Because of the high number of endemic species (many of which are dominants in the community), the unusual oaks, and a rich herbaceous understory, Burton Mesa Chaparral has been recognized as a valuable biological resource by local biologists and the County of Santa Barbara. Various land uses have reduced its original limited extent which has been estimated as follows:

Original Central Chaparral Habitat	22,153 acres
1938 Central Maritime Chaparral	14,563 acres
1987 Central Maritime Chaparral	8,618 acres

In 1988 it was reported that of the 39 percent of original habitat that remains, two-thirds is found within Vandenberg Air Force base, where it is severely threatened by military development and land management practices that have resulted in the invasion of vigorous exotic (non-native) species particularly ice plant. These trends are continuing at a rapid rate (Odion, Hickson and D'Antonio 1992, Philbrick and Odion 1988).

³ Some species such as the western pond turtle may utilize upland habitat as much as 1/4 mile away from the riparian wetland (Sweet 1992).

Since the time the 1988 report was written a 5,125 acre property was acquired by the State of California. This land contains roughly 3,250 acres of semi-pristine to pristine, and roughly 150 acres of degraded Central Maritime Chaparral, in addition to substantial acreages of other important plant communities (Odion, Storrer and Semonsen 1993). Mitigation efforts are now being focused on acquisition of adjacent lands and funding of habitat restoration and management within the preserve.

b. Coastal Sage Scrub.

- (1) **Description.** Coastal sage scrub is a drought-tolerant, Mediterranean habitat characterized by soft-leaved, shallow-rooted sub-shrubs such as California sagebrush, (*Artemisia californica*), several sage species (*Salvia spp.*), California buckwheat (*Eriogonum spp.*), and California encelia (*Encelia californica*) (Bowler, 1990). Commonly called "soft chaparral", Coastal sage scrub is highly fire adapted, and increases in species richness following fires, but a second wave in the number of species (mostly understory species that are not fire successional) occurs 15-25 years after burning (Westman 1987).

Coastal sage scrub and the related coastal succulent scrubs in northern Baja California originally extended from San Francisco to El Rosario in Baja California and has been divided into four floristic associations, two of which occur in Santa Barbara County: Diablan (San Francisco to Point Conception) and Venturan (Point Conception to Los Angeles). Coastal sage scrub is limited to the lower elevations of both the coastal and interior regions of the mountains where moist maritime air penetrates inland.

More than a decade ago it was estimated that 85 to 90 percent of the original coastal sage scrub habitat (Westman, 1981) had been eliminated as a result of urban development and agriculture (O'Leary, 1989). Other factors contributing to loss of this habitat have been reported to be increased air pollution and changes in fire frequency due to fire suppression activities. Coastal sage scrub is being reduced in its overall extent and fragmented by road and urban development particularly in Orange and San Diego Counties.

(2) **Project design suggestions.**

- (a) The basic principles of preserving biodiversity apply to this habitat type. Design the project so that continuous, unbroken habitat areas are preserved to the greatest extent feasible.
- (b) Retain corridors to connect with other undisturbed areas to preserve wildlife travel corridor.
- (c) Removal of invasive exotic species such as freeway ice plant (Zedler and Scheid 1988) and pampas grass improves the quality of the remaining habitat.
- (d) Consider indirect effects of chaparral removal, including reduction of groundwater recharge, increased erosion and sedimentation to adjacent creeks and streams which may affect riparian habitats and wildlife.
- (e) Balance between design measures for habitat protection and for fire management.

c. Native grasslands.

- (1) **Description.** Native grasslands which are dominated by perennial bunch grasses such as purple needlegrass (*Stipa pulchra*) tend to be patchy (the individual plants and groups of plants tend to be distributed in patches). Valley Grassland in California once occurred over 8 million acres in the Central Valley and in scattered patches along the Coast Ranges (Heady, 1977). Few stands of native grasslands remain in the state and the habitat is considered rare both in the state and within the county. Even among the "pristine" grasslands in the state, the vegetative cover of native grassland species is reportedly rarely greater than 50 percent, and in many of these reserves it is commonly found between 15 and 25 percent of the total vegetative cover (Keeler-Wolf, 1992). A study commissioned by the County in 1989 reported that native grassland areas are exceedingly rare in the County, except on the Channel Islands and inside Gaviota State Park (Odion, 1989).
- (2) **Project design suggestions.**
 - (a) Design the project so that continuous habitat areas are preserved to the greatest extent feasible.
 - (b) Incorporation of restoration and enhancement measures, including weeding, intentional burning, revegetation (planting of seeds or plugs), or other procedures will facilitate natural regeneration of the grassland.

d. Woodlands and Forests.

- (1) **Description.** Generally speaking, there are three types of oak woodlands in Santa Barbara County. Valley Oak Woodland is typically characterized by scattered trees surrounded by grassland, whereas trees in live oak and blue oak woodlands tend to be more closely spaced. Coast Live Oak (*Quercus agrifolia*) forms dense groves of trees on north-facing slopes and is the primary oak species found in southern oak woodlands. Deep alluvial soils in interior valleys support grasslands and Valley Oak Woodland (*Quercus lobata* and *Quercus agrifolia*). The foothills of the inner coast ranges are inhabited by Blue Oak (*Quercus douglasii*), Coast Live Oak (*Quercus agrifolia*), Digger Pine (*Pinus sabiniana*), and other components of blue oak woodland. The number, type, and density of oak trees, are principal characteristics which define the various types of woodlands; further, the relationship between trees and vegetation in the understory below in woodlands also define variety in woodland habitats. In addition to oak forests, a variety of pine and other coniferous forests also occur in the county. Oak communities are emphasized in the following discussion because they so frequently occur in the same areas in which developments are proposed.

Oak habitats offer diverse resources to wildlife: shade in summer, shelter in winter, perching, roosting, nesting, and food storage sites. Acorns are the most plentiful food source, but oak catkins, twigs, leaves, buds, sap, galls, fungi, lichens, and roots all provide important foods. Other species associated with the oak woodland include redberry, coffeeberry, toyon, mistletoe, poison oak, forbs and grasses which are also important foods for wildlife. Insects feeding in oak habitats are eaten by birds, reptiles, amphibians, mammals and other insects which in turn feed larger predators such as owls, hawks, snakes, bobcats, coyotes, mountain lions and bears. Some oak trees are "granary trees" in which acorn woodpeckers store acorns. Scrub jays and magpies inadvertently "plant" acorns when they store them in the ground. Dead trees,

or snags, provide perching, feeding and nesting sites for raptors as well as thermal cover for smaller mammals, reptiles and amphibians. Oaks provide wildlife habitat from the seedling through the snag (dead tree) stages of succession in the woodland. This habitat type supports a diverse wildlife population, and disruption of the woodland often indirectly results in disrupting wildlife breeding, nesting, foraging, and dispersal.

(2) Project design suggestions for Woodlands and Forests.

- (a) Retain contiguous blocks of habitat area particularly where adjacent to offsite habitat areas.
- (b) Retain animal migration corridors to other habitat areas.
- (c) Retain understory.

(3) Project design suggestions for individual native trees.

- (a) **Avoidance.** The preferred method of protecting native trees is to avoid any disturbance within the area 6 feet away from their driplines (the outermost edge of a tree's foliage) and drainage patterns above and below the tree. Although the stabilizing structural roots generally occur within the dripline, numerous and highly significant "feeder roots" which facilitate gas and water exchange and uptake of nutrients occur outside the dripline.

For management purposes, it is useful to think of a tree's root zone as being one third larger than the drip line area (University of California Cooperative Extension, no date). As a general rule, avoid grading and impervious surfaces within 6 feet of the dripline of all significant trees where ever feasible. This may be adjusted upwards or downwards depending on the size of the tree. It is advisable to include a margin of safety to account for unintentional errors during the construction phase of the project. The most vulnerable parts of a mature tree are the root crown (at the base of the trunk) and the entire root zone.

- (b) **Broad scale irrigation.** Avoid irrigation with rainbirds beneath previously un-irrigated oaks because it is likely to create conditions favorable to oak root fungus. It is advised that irrigation water, if necessary, be infrequent (i.e., once a week), be done by hand or drip method (Semonsen 1992, Doud 1992), and be no closer than 6 to 10 feet (depending on the size) from the trunk of the tree.
- (c) **Hard surfaces.** Any hard surfaces under oaks would better consist of paving blocks or other material which will allow air and rain water to reach the roots.
- (d) **Ground disturbance.** As a general guideline, disturb no more than 20 percent of the total area beneath the dripline of any one tree.

(4) Project design guidelines for non-native trees

- (a) Monarch butterfly wintering sites can be preserved by keeping the grove of trees in a state so that shelter from wind and temperature extremes are retained. This may include other trees outside the main grove that affect wind exposure.
- (b) Where possible, preserve other non-native trees that have value to important wildlife species.

D. Biological Mitigation Measures.

Please refer to the conditions of approval or mitigation measures in the biology section of the Santa Barbara County *A Planners Guide to Conditions of Approval and Mitigation Measures* which contains a listing of model measures containing standard language used when such measures are applied as conditions of permit approval. Please note that these measures are not applicable to all cases and projects. In addition, the wording of measures may be customized as appropriate to address specific project circumstances.

REFERENCES

- Adams, L.W. & Dove, L.E. 1989. Wildlife Reserves and Corridors in the Urban Environment, A Guide to Ecological Landscape Planning and Resource Conservation. For the U.S. Fish and Wildlife Service, U.S. Department of the Interior.
- Adams T.E. Jr., No date. Oak Seedling Mortality: Some Causes and Prevention.
- Bailey, James A. 1984. Principals of Wildlife Management. Colorado State University.
- Baird, Kathryn 1989. High Quality Restoration of Riparian Ecosystems. CALTRANS District 11. Published in "Restoration & Management Notes" Vol. 7, No. 2. Society for Ecological Restoration. Madison, Wisconsin.
- Barbour, Burk and Pitts 1980. Terrestrial Plant Ecology. The Benjamin/Cummings Publishing Company, Inc. Menlo Park, California.
- Borchert, M.I., Davis, F.W., Michaelsen, J. and Oyler, L.D. 1989. Interactions of factors affecting seedling recruitment of blue oak (Quercus douglasii) in California. Ecology 70: 389-404.
- Bowland, Jackie and Wayne R. Ferren, Jr. August 1992. "Draft Wetland Classification and Environmental Analysis for the Dos Pueblos Golf Links." Prepared for ARCO Oil and Gas Company, Goleta, California.
- Bowler, Peter 1990. Coastal Sage Scrub Restoration-I: The Challenge of Mitigation. Published in "Restoration & Management Notes" Vol. 8, No. 2. Society for Ecological Restoration. Madison, Wisconsin.
- Brown R. and Davis F. 1991. Historical Mortality of Valley Oak (Quercus lobata, Nee) in the Santa Ynez Valley, Santa Barbara County, 1938-1989. USDA Forest Service Gen. Tech. Rep. PSW-126.
- California Coastal Commission, 1981. Statewide interpretive guidelines for wetlands and other wet environmentally sensitive habitat areas. Adopted February 4, 1981.
- California Department of Fish and Game, 1992(a). Significant Natural Areas of California 1992 Summary. Lands and Natural Areas Program.
- California Department of Fish and Game, 1992(b). Letter to Jeff Harris, Resource Management Department, regarding Draft Biological Thresholds.
- California Department of Fish and Game, 1987. Department of Fish and Game Recommended Wetland Definition, Mitigation Strategies, and Habitat Value Assessment Methodology. Presented by Glenn Rollins, Environmental Services Supervisor in public workshop to the Fish and Game Commission on June 24, 1987, Sacramento.
- California Department of Fish and Game, 1984. Guidelines for Assessing Effects of Proposed Developments on Rare and Endangered Plants and Plant Communities.
- California Native Plant Society, 1988. Inventory of Rare and Endangered Vascular Plants of California. Special Publication No. 1; Fourth Edition. Sacramento, California.
- California Native Plant Society, 1991. Mitigation Guidelines Regarding Impacts to Rare, Threatened, and Endangered Plants. By CNPS Rare Plant Scientific Advisory Committee.
- Callaway Ragan M. 1990. Effects of Soil Water Distribution on the Lateral Root Development of Three Species of California Oaks. American Journal of Botany 77(11): 1469-1475.
- Callaway Ragan M. in press. Effects of Shrubs on the Recruitment of Quercus douglasii and Quercus lobata in Central California. Department of Biological Sciences, University of California, Santa Barbara, CA 93106. Ecology.
- Chadwick, Douglas 1992. "U.S. Imperative: Networking Habitats". Defenders Magazine. Vol. 67, Number 5.
- Collins, Paul 1992. Letter to Jeff Harris, County of Santa Barbara, Resource Management Department; Comments on Preliminary Draft Thresholds.
- Cowardin, Carter, Golet and LaRoe, 1979. Classification of Wetlands and Deepwater Habitats of the United States. Office of Biological Services, Fish and Wildlife Service, U.S. Department of the Interior.
- Craul, Phillip J. 1992. Urban Soil: Problems and Promise. Fremontia. Volume 20 No. 4. California Native Plant Society.

- Cummings, Earle W. and Stephen J. Nicola, 1986. Guidelines for Consulting with the Department of Fish and Game on Projects Subject to CEQA that May Affect Endangered and Threatened Species California Department of fish and Game; Environmental Services Division. Administrative Report 86-1.
- Dames and Moore 1985. Biological Investigations, Double J Ranch, Los Olivos, California. Prepared for Double J Enterprises. Contained within McClelland Engineers 1986, 86-EIR-7, prepared for Santa Barbara County Resource Management Department.
- Danielsen, K.C. 1990. Seedling Growth of Quercus lobata Nee (valley oak) and the Competitive Effects of Selected Grass Species. Thesis, California State University Los Angeles, U.S.A.
- Davis F., 1992a. Telecommunication with Elihu Gevirtz, Resource Management Department, April.
- Davis F., 1992b. Quoted in Santa Barbara News Press, March 29. "Oaks May be Dying Breed in the Santa Ynez Valley".
- Doud, Ken, 1992. Floribunda Gardens, Santa Barbara, California, personal communication.
- Faber, P. 1982, Common Wetland Plants of Coastal California: A Field Guide for the Layman. Pickleweed Press.
- Faber and Holland 1988, Common Riparian Plants of California, A Field Guide for the Layman. Pickleweed Press.
- Ferren W., Forbes H., Roberts D., Smith D. 1984. The Botanical Resources of The La Purisima Mission State Historic Park. Herbarium Publication No. 3, University of California, Santa Barbara.
- Ferren W. and Gevirtz E. 1990. Restoration and creation of vernal pools: cookbook recipes or complex science? In D.H. Ikeda and R.A. Schlising [ed.s], Vernal pool plants-their habitat and biology, 89-107. Studies from the Herbarium No. 8, California State University, Chico.
- Ferren W. and Pritchett D., 1988. Enhancement, Restoration, and Creation of Vernal Pools at Del Sol Open Space and Vernal Pool Reserve, Santa Barbara County, California. Environmental Research Team, The Herbarium, Environmental Report 13, Department of Biological Sciences, University of California, Santa Barbara.
- Gibbons, Boyd, Director of the California Department of Fish and Game, January 7, 1992. Letter to Mr. Jim Burns, Assistant Executive Director California Coastal Commission regarding DFG Wetland Identification Procedures.
- Griffin and Critchfield 1972. The Distribution of Forest Trees in California. USDA Forest Service Research Paper PSW-82/1972.
- Heritage Oaks Committee, 1977. Native Oaks: Our Valley Heritage; A Guide to the Botany, Care, and Planting of Native Oaks in the Sacramento Valley. Sacramento, California.
- Holland, Robert F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California, California Department of Fish and Game, Nongame Heritage Program
- Holland V.L. and D.J. Keil 1990. California Vegetation. 4th Edition. Biological Sciences Department California Polytechnic State University San Luis Obispo, California.
- Holland and Griggs, (date unknown). A Unique Habitat: California's Vernal Pools. Fremontia; California Native Plant Society.
- Holland and Jain 1977. Vernal Pools. In Barbour and Major [eds], Terrestrial Vegetation of California, 515-533. Wiley-Interscience, New York
- Howald, Ann M. and Laurie Parendes Wickenheiser 1990. Mitigation Plan Annotated Outline for Endangered Plants of California. California Department of Fish and Game, Natural Heritage Division; Endangered Plant Program.
- McCreary, D. 1990. Seasonal Growth Pattern of Blue and Valley Oak Seedlings Established on Foothill Rangelands. Presented at Oak Woodlands and Hardwood Rangeland Management: A Research Symposium, October 31-November 2, 1990. University of California, Davis.
- Menke, John W. 1992. Grazing and Fire Management for Native Perennial Grass Restoration on California Grasslands. Fremontia, Vol. 20, No. 2, California Native Plant Society.
- Morro Group, The. 1989. Final Environmental Impact Report: Kelly-Gausman Land Division (89-EIR-2); Vandenberg Village, Santa Barbara County. Prepared for Santa Barbara County Resource Management Department.
- Odion, Dennis, John Storrer and Vincent Semonsen. 1993. Biological Resources Assessment: Burton Mesa Project Area, Santa Barbara County, California. Prepared for the Santa Barbara County Resource Management Department.
- Odion, Dennis, Diana Hickson and Carla D'Antonio. 1992. Central Coast Maritime Chaparral on Vandenberg Air Force Base: an inventory and analysis of management needs for a threatened vegetation type. Prepared for The Nature Conservancy.
- Odion, Dennis. 1989. Native Grassland Resources in Santa Barbara County: An Evaluation of Preserve Sites and Mitigation Policy.
- Olson, Mark 1992a. Botanical Resources of the Camino Corto Vernal Pool Parcel, Isla Vista, California. A report presented to The Santa Barbara County Resource Management Department. 30 April 1992.

- Olson, Mark 1992b. Vernal Pools of Northern Santa Barbara County, California. A report presented to the Santa Barbara County Resource Management Department. The Herbarium, Department of Biological Sciences, University of California at Santa Barbara, CA. 30 September 1992.
- Perry Thomas O. 1992. Tree Roots: Facts and Fallacies. Fremontia, Volume 20, No. 4. California Native Plant Society.
- Philbrick R. 1992. "Assessment of Rare Plants and Sensitive Vegetation for Solvang 594." Prepared for Santa Barbara County Resource Management Department.
- Philbrick R. and Odion D. 1988. Analysis of Preserve Sites for Burton Mesa Chaparral. Prepared for Santa Barbara County Resource Management Department.
- Reed, Porter B. 1988. National List of Plant Species that Occur in Wetlands: California (Region O). U.S. Fish and Wildlife Service. Biological Report 88 (24).
- San Francisco Bay Conservation and Development Commission 1987. Mitigation Practices Guidebook.
- Santa Barbara County Resource Management Department 1992. Santa Ynez Valley Biological Habitat Map.
- Santa Barbara News Press. 1993. "California Gnatcatcher Tests Clinton on Endangered Species". March 26.
- Sather, J.H. and R.D. Smith 1984. An Overview of Major Wetland Functions and Values. U.S. Fish and Wildlife Service. FWS/OBS-84/18.
- Semonsen, Vincent 1992. Comments on Draft Biological Thresholds. Dec. 6.
- Sidle, John G. and David B. Bowman, Endangered Species Division, U.S. Fish and Wildlife Service, 1988. Habitat Protection Under the Endangered Species Act. in Conservation Biology, Volume 2, No. 1, pp. 116-118.
- Smith, C. 1976. A Flora of the Santa Barbara Region, California. Santa Barbara Museum of Natural History, Santa Barbara, California.
- Soiseth Chad, Sheila Wiseman, and Scott D. Cooper 1992. Faunal assemblages in vernal pools: evaluating the effectiveness of restoration efforts. Lecture presented at A Symposium: Restoration and Creation of Wetlands in Coastal Central and Southern California. The 73rd Annual Meeting, Pacific Division, AAAS; University of California, Santa Barbara.
- Steven Craig and Associates, 1984. Rancho Saguario Environmental Impact Report; 84-EIR-5. Prepared for Santa Barbara County Resource Management Department.
- Stone, R. D. 1990. California's endemic vernal pool plants: some factors influencing their rarity and endangerment. In D.H. Ikeda and R.A. Schlising [ed.s], Vernal pool plants-their habitat and biology, 89-107. Studies from the Herbarium No. 8, California State University, Chico.
- Storrer, John 1992. Letter to Elihu Gevirtz, County of Santa Barbara, Resource Management Department; Comments on Preliminary Draft Thresholds.
- Storrer and Semonsen Environmental Services 1988. Biological Resource Evaluation: 1200 North Ballard Canyon Road, Santa Barbara County, California. (Consulting Botanist: Katherine Rindlaub)
- Sudworth G. 1967. Forest Trees of the Pacific Slope. Dover Publications, Inc., New York, New York. First published in 1908 by the U.S.D.A.
- Sweet, Sam. 1993. Personal communication with Elihu Gevirtz.
- Sweet, Sam. 1992. "Riparian Riches" Lecture. April, Goleta Library.
- Tate, J. 1986. The Blue List for 1986. American Birds 40(2) 227-236.
- Tierney, R. 1991. 4th Year Progress Report: Off-Site Mitigation All American Pipeline Long-Term Revegetation. Santa Barbara California. November. Prepared for County of Santa Barbara Resource Management Department, Energy Division.
- University of California Cooperative Extension, no date. Living Among the Oaks: A Management Guide for Landowners. Natural Resources Program, Berkeley.
- U.S. Army Corps of Engineers and U.S. Environmental Protection Agency 1990. Memorandum of Agreement Between the [EPA] and the Department of the Army Concerning the Determination of Mitigation Under the Clean Water Act Section 404(b)(1) Guidelines.
- U.S. Bureau of Land Management, U.S. Forest Service, U.S. Fish and Wildlife Service, U.S. National Park Service, University of California, California Resources Agency, California Department of Fish and Game, Forestry and Fire Protection, Parks and Recreation and the State Lands Commission, no date. Memorandum of Understanding California's Coordinated Regional Strategy to Conserve Geological Diversity: "The Agreement on Biological Diversity".
- U.S. Fish & Wildlife Service, Department of the Interior, 1991a. Endangered and Threatened Wildlife and Plants. 50 CFR 17.11 & 17.12. July 15.

- U.S. Fish & Wildlife Service, Department of the Interior, 1991b. Endangered and Threatened Wildlife and Plants; Animal Candidate Review for Listing as Endangered or Threatened Species, Proposed Rule. 50 CFR Part 17 Federal Register. November 21.
- U.S. Fish & Wildlife Service, Department of the Interior, 1992. Notice of Proposed Endangered Status for Four Fairy Shrimp and Vernal Pool Tadpole Shrimp Endemic to Vernal Pools and Swales in California. May 14.
- Uram, Robert. 1991. *California Wetlands Seminar*. University of California, Santa Barbara.
- West, Susan. 1991. Preserving Cougar Country: A Guide to Protecting Mountain Lion and Deer Habitat in California. For the Mountain Lion Foundation.
- Wetland Training Institute, Inc. 1991. Field Guide for Wetland Delineation: 1987 Corps of Engineers Manual. WTI 91-2. 133pp.
- Wilcove, David, Margaret McMillan and Keith Winston 1993. "What Exactly is an Endangered Species? An Analysis of the U.S. Endangered Species List: 1985-1991." *In Conservation Biology*, Volume 7, No. 1.
- Wiskowski, Tara 1988. Sensitive Plants of Santa Barbara County. Prepared for the Division of Environmental Review, Resource Management Department, Santa Barbara County
- Work G. No date. Observations and Questions from the Work Ranch. San Miguel, California.
- Zedler, Joy. 1982. The ecology of southern California coastal salt marshes: a community profile. U.S. Fish and Wildlife Service, Biological Services Program, Washington, D.C. FWS/OBS-81/54.
- Zedler, Joy. and R. Langis 1991. Authenticity: Comparisons of Constructed and Natural Salt Marshes of San Diego Bay. Restoration and Management Notes Vol. 9, No. 1. Society for Ecological Restoration. Madison, Wisconsin.
- Zedler, Paul 1987. The ecology of southern California vernal pools: a community profile. U.S. Fish and Wildlife Service Biological Report 85 (7.11).
- Zedler, Paul. and Scheid G.A. 1988. Invasion of *Carpobrotus edulis* and *Salix lasiolepis* after Fire in a Coastal Chaparral Site in Santa Barbara County, California. *Madrono* 35: 196-201.