CALIFORNIA COASTAL COMMISSION
NORTH CENTRAL COAST DISTRICT
45 FREMONT, SUITE 2000
AN FRANCISCO, CA 94105- 2219
DICE AND TDD (415) 904- 5260
AX (415) 904- 5400

Th-13a

RECORD PACKET COPY

Filed: April 10, 2002
49th Day: May 29, 2002
Staff: SLB/CLK – SF
Staff Report: April 25, 2002
Hearing Date: May 9, 2002

STAFF REPORT – APPEAL
SUBSTANTIAL ISSUE

APPEAL NO.:	**A-2-02-09**
APPLICANTS:	**Point Reyes Affordable Housing, Inc.**
AGENT:	**Lamar Turner**
LOCAL GOVERNMENT:	**Marin County**
ACTION:	Approval with Conditions.
PROJECT LOCATION:	857 Mesa Road, Point Reyes Station, Marin County. APNS 119-240-45, -46, -57, and 58
PROJECT DESCRIPTION:	Subdivision of 18.6 acres into 13 lots, construction of 27 affordable rental apartment units, 7 for sale affordable single-family residences, and associated infrastructure, reservation of lots for future development of one market rate single-family residence with a guest unit and barn, a 20-room inn, public parking and a public restroom, and preservation of 2.58 acres of open space.
APPELLANTS:	Elena Belsky, Mark Warner, and Tomales Bay Association Commissioners Christina Desser and Mike Reilly
SUBSTANTIVE FILE DOCUMENTS:	Appendix A

STAFF NOTE

The local government action on the approved development included both the submittal of an amendment to the Marin County certified Local Coastal Program (LCP) to the Commission and approval of a coastal development permit (CDP). The LCP amendment is necessary because the approved development does not conform to the site's pre-LCP amendment zoning. The zoning change is required because the approved development's clustered design does not conform to the minimum lot-size and setback standards of the pre-amendment zoning. In order to be effective, the zoning change must be certified by the Commission as an amendment to the LCP. Because the County's final action approving the CDP for the project preceded Commission certification of the related LCP amendment, the approved development is on its face inconsistent with the certified LCP. This basic LCP consistency issue would be resolved if the Commission certifies the LCP amendment as submitted. As such, Marin County LCP Amendment 1-MAJ-02 is scheduled for Commission consideration and action prior to the hearing on this appeal. The following staff recommendation and findings concerning Appeal A-2-02-09 assumes prior Commission action certifying Marin County LCP Amendment 1-MAJ-02 as submitted consistent with the staff recommendation.

SUMMARY OF STAFF RECOMMENDATION

The appeal of Elena Belsky, Mark Warner, and Tomales Bay Association is filed on the grounds that the approved development is inconsistent with the policies of the certified Marin County LCP concerning protection of water quality, sensitive habitats, and human health from adverse impacts related to the approved septic systems and polluted runoff.

The County worked with the applicant, the staff of the San Francisco Bay Regional Water Quality Control Board (RWQCB), and the Commission's Water Quality Unit to respond to these issues. The County also hired a consultant to conduct a third party review of the engineering studies submitted by the applicant's and the appellants' consultants. As a result, the County modified its conditions of approval in accordance to the specific recommendations of the RWQCB staff to address the water quality issues raised by the appellants.

In particular, Condition 58 requires the applicant to monitor the septic systems to verify compliance with the system's engineering and ambient condition design criteria and to provide contingency measures such as pre-treatment or leach field modifications to correct any unexpected problems. In addition to requiring state-of-the-art storm water and erosion control best management practices, the County's conditions of approval require the approved storm water system to capture and treat on site 100 percent of the 100-year, 24-hour design storm event. This substantially exceeds the 85th percentile, 24-hour design storm requirement typically required by the Commission.

The Commission's Water Quality Unit has reviewed the information in the local record, including the appellants' and the applicant's consultant reports, the County's third party peer review, and correspondence from the RWQCB. The information reviewed by the Water Quality Unit supports the County's findings that the conditions of approval as modified are adequate to fully address any outstanding issues related to wastewater polluted runoff control and treatment. This determination is consistent with the determination of the staff of the RWQCB and the County's third party peer review. Therefore, the staff recommends the Commission find no

substantial issue is raised with respect to the grounds on which the appeal of Belsky, Warner and Tomales Bay Association is filed.

The local government action on the approved development included both the submittal of an amendment to the LCP to the Commission and approval of a CDP. The LCP amendment is a necessary precedent to the CDP because the approved development does not conform to the site's pre-LCP amendment zoning. The zoning change is required because the approved development's clustered design does not conform to the minimum lot-size and setback standards of the pre-amendment zoning. Because the County's final action approving the CDP for the project precedes Commission certification of the related LCP amendment, the approved development was at the time of the final local action inconsistent with the certified LCP. It is on this basis that Commissioners Desser and Reilly appealed the CDP.

Prior to its consideration of this appeal, the Commission certified Marin County LCP Amendment 1-MAJ-02 as submitted. As such, the above-cited zoning inconsistency is resolved and the approved development conforms to the currently effective certified LCP zoning designation for the project site. Therefore, the Commission finds that no substantial issue exists with respect to the grounds on which the appeal of Commissioners Desser and Reilly is filed.

1.0 STAFF RECOMMENDATION

No Substantial Issue

The staff recommends that the Commission determine that no substantial issue exists with respect to the grounds on which the appeal has been filed.

Motion

I move that the Commission determine that Appeal No. A-2-02-09 raises NO substantial issue with respect to the grounds on which the appeal has been filed under § 30603 of the Coastal Act.

Staff Recommendation of No Substantial Issue

Staff recommends a **YES** vote. Passage of this motion will result in a finding of No Substantial Issue and adoption of the following resolution and findings. If the Commission finds No Substantial Issue, the Commission will not hear the application de novo and the local action will become final and effective. The motion passes only by an affirmative vote by a majority of the Commissioners present.

Resolution to Find No Substantial Issue

The Commission finds that Appeal No. A-2-02-09 does not present a substantial issue with respect to the grounds on which the appeal has been filed under § 30603 of the Coastal Act regarding consistency of the approved development by the County with the Certified Local Coastal Plan and/or the public access and recreation policies of the Coastal Act.

2.0 PROJECT SETTING AND SITE DESCRIPTION

2.1 Project Location and Site Description

The project site is located at 857 Mesa Road on an 18.59-acre undeveloped property on the northeast side of the unincorporated village of Point Reyes Station in Marin County (Exhibit 1).

The site is a moderately sloped hillside dominated by upland vegetation, primarily annual Mediterranean grassland. Three plant communities were identified at the site: seasonal freshwater wetland, grazed Mediterranean grasslands, and ornamental landscape planting. The site supports five small seasonal wetlands totaling approximately 0.25 acre (Exhibit 2). The seasonal wetlands are located in three distinct areas within the project site. The first area (approximately 3,003 square feet) is located on the western portion of the site. The largest wetland area (a complex of three wetlands totaling approximately 5,029 square feet) is located in the central portion of the site. A third, smaller wetland (approximately 2,924 square feet) is located centrally in the eastern portion of the site. Currently, horses graze the area of the wetlands. An abandoned house, corral, and associated out buildings surrounded by mature overgrown landscape and agricultural plantings are located on the southern entrance to the site. A cluster of bishop pines stands along the driveway opposite the house and a windrow of Monterey pines on the adjacent West Marin School site line the uphill boundary of the site. Commodore Webster Drive is planted with a row of Monterey cypress trees bordering the southeastern edge of the site. At present, the property is used as a grazed pastureland for horses. Lagunitas Creek, a tributary of Tomales Bay, is located approximately 400 feet from the southern property boundary (Exhibit 3). The project site is primarily separated from the creek by a line of ornamental trees, Commodore Webster Drive, open grassland, and riparian vegetations along the creek. There is a United States Coast Guard (USCG) housing complex located between the creek and the southeast corner of the project site.

The project site is one block north of A Street (Highway 1), the main downtown street of Point Reyes Station on Mesa Road. West Commodore Webster Drive borders the site on the southwest and southeast, respectively, and by vacant land on the east and northeast. Surrounding land uses include West Marin School (grades 2 through 8) on the north, single-family residences on the west, commercial establishments of the village on the south and southwest, the USCG housing complex on the southeast, USCG-vacant land on the east, and vacant land currently proposed for the Point Reyes Commons senior housing project on the northeast.

2.2 Project Description

The approved development consists of: (1) the construction of 27 affordable rental apartments and 7 affordable for-sale single-family residences; (2) the reservation of land area for future development of a three-bedroom, up to 2,800-square-foot market rate single-family residence, a one-bedroom, up to 750-square-foot cottage, and a barn; (3) the reservation of 2.28 acres of land area for future development of a 20-room, up to 17,000-square-foot lodge or a similar visitor-serving use; (4) the reservation of 0.62 acre of land area for future development of a 12-space public parking lot and a restroom structure; and (5) the reservation of 2.68 acres of land for open space conservation purposes; (6) subdivision of four existing lots into 13 separate lots; (7) infrastructure improvements; and (8) installation of onsite storm water and wastewater collection and treatment systems.

Wastewater Disposal

The approved project includes 12 separate wastewater-generating parcels, each of which would be served by its own onsite wastewater treatment and disposal system the (thirteenth parcel is to remain as open space). The 12 parcels include the following: (1) the affordable for-sale Papermill Creek single-family residences (Parcels 1-7); (2) 15-unit Papermill Creek Apartments (Parcel 8); (3) 12-unit William Street Apartments (Parcel 11); (4) 2-unit market rate area (Parcel

9); public restroom (Parcel 12); and (5) future overnight visitor serving designated area (Parcel 10).

Septic tanks will be provided for primary treatment and, with the exception of the market rate parcel located in the northeast corner of the project site, effluent disposal will be via standard subsurface leaching trench fields. The market rate parcel will utilize a mound system for effluent disposal because the shallow perched groundwater that occurs in the northeastern portion of the site prohibits the use of subsurface leach fields. Low-flow water fixtures will be used for public restrooms and all residential units. The fixtures for the future commercial use will be designed when the facility is designed. Pursuant to Conditions 70 and 72 and consistent with County standards for septic tank design, all septic tanks will have the capacity sufficient to provide two days of detention volume and will include a two-inch vent on the baffle wall. Below are the details for the specific onsite wastewater treatment and disposal systems for Parcels 1-12.

Papermill Creek Single-Family homes (Parcels 1-7)

The single-family homes will be located on individual parcels and will each be served by its own conventional onsite septic tank/leachfield system. Exhibit 4 shows the leach field areas for the single-family homes. The exact siting of the septic tank will be determined at the time of design. Based on the approved house locations, all of the leach fields will be gravity fed from the septic tank, except Lot 7, which will require a pump. None of the leach fields will require pressure dosing. The leaching trenches are proposed to be 36-inches deep for Lots 1, 2, 3, 4, and 7. Lots 5 and 6 will have 48-inch deep trenches. Each leach field will accommodate the dual-field system with a total capacity of at least 630 gpd.

Apartment Complexes (Papermill Creek Apartments, parcel 8 and Williams Street Apartments, Parcel 11)

The Papermill Creek Apartment and Williams Street Apartments are located on separate parcels and will each be served by its own onsite treatment and disposal system. Each apartment complex will be served by septic tanks sized and located consistent with County Standards (the exact siting of these septic tanks will be determined at the time of design). Conventional gravity sewers leading to the septic tanks will convey sewage from the buildings to the septic tank for primary treatment. Exhibit 4 shows the leach field areas for the two apartment complexes. The leachfields that will serve the Papermill Creek Apartments will be located in two separate areas, a lower area and an upper area. The two areas together are proposed to accommodate a standard dual leachfield system with capacity of 6,800 gpd. The upper leachfield and the upper-lower leach field will be used as winter fields to spread the effluent as evenly as possible to alleviate any potential groundwater mounding effect during wet weather. The lower leach field will accommodate the entire wastewater flow during the summer. The leach field for the Williams Street Apartment will be located in one area, and will accommodate a standard dual leach field system with a total capacity of 5,400 gpd.

The leach fields systems will be pressure dosed, will require pumps and the leaching trenches will be 36-inches deep. Pursuant to Condition 71, the dosing chambers and overflow tanks for the pressurized systems will be sized to accommodate the peak day wastewater generation volume for the corresponding land use to ensure compliance with County standards. High, alarms will be installed in all wastewater-pumping systems, in accordance with County standards, to alert the operator or maintenance staff of a high level in the pump tank. All

pumping systems will include provisions for extended operation during general power outages using a portable emergency generator. A licensed septic system, pump, or plumbing contractor, septic system pumping service, or other qualified maintenance person as identified in an Operating Permit, if issued for the system by the County will perform scheduled and emergency maintenance of the pressurized systems.

Market Rate Parcel (Parcel 9)

The market rate parcel will include a three-bedroom main house plus a one-bedroom guest cottage that will be served by an onsite mound system. A mound system (serving both the main house and guest cottage) will be used for effluent disposal because of the shallow perched groundwater conditions that occur in this area of the project site. Exhibit 4 shows the reserve area for the mound system. The total field capacity is at lest 840 gpd.

Overnight Visitor Serving Commercial Parcel (Parcel 10)

Parcel 10 will be defined in the future, and is intended to be an overnight visitor serving facility. The approved project includes a dual leach field system with a total capacity of 3,040 gpd and will have a pressure dosed leach field system with 36-inch leaching trenches. Exhibit 4 shows the approved leach field area for the commercial parcel. Pursuant to condition 60, when the septic system for the future visitor-serving commercial parcel is designed, it will be designed to comply with Environmental Health Services regulations. Pursuant to Condition 71, the dosing chambers and overflow tanks for the pressurized systems will be sized to accommodate the peak day wastewater generation volume for the corresponding land use to ensure compliance with County standards. High, alarms will be installed in all wastewater-pumping systems, in accordance with County standards, to alert the operator or maintenance staff of a high level in the pump tank. All pumping systems will include provisions for extended operation during general power outages using a portable emergency generator. A licensed septic system, pump, or plumbing contractor, septic system pumping service, or other qualified maintenance person as identified in an the County's Operating Permit, required for the system, will perform scheduled and emergency maintenance of the pressurized systems will be performed.

Public Restrooms (Parcel 12)

The public restrooms will be located on the parcel with the public parking lot and will be served by a single conventional onsite septic tank/leach field system. Exhibit 4 shows the approved leach field area for the restrooms. The exact siting of the septic tanks will be determined at the time of design. Pursuant to Condition 73, to meet County standards, the wastewater treatment system for the public restrooms must use either ultra low flush urinals and very low flow toilets that generate an average of 2 gpd/person or less will be used for the public restrooms, or low flow fixtures that generate an average of 3.5 gpd/person. The restroom septic system will use a 2,500-gallon septic tank and a 5,040 square-foot leach field. The leach field will accommodate a dual-field system with a total capacity of 900 gpd.

Drainage System

The approved project would change the runoff characteristics of the site through the construction of buildings, paved roadways and parking surfaces, and semi permeable rock roadways and paths. The approved project includes an onsite storm water collection and treatment system that incorporates drainage trenches to capture, infiltrate, and treat project runoff. Pursuant to Condition 46, the capacity of the proposed retention facilities will be sized such that the project

results in no increase in post-development runoff volumes beyond existing runoff volumes from a 100-year, 24-hour storm event. This event represents the largest design event (by volume) commonly used as an industry standard. The following requirements will be satisfied: (1) no increase in post-development runoff volumes beyond existing runoff volumes from a 100-year, 24-hour storm event; (2) the drainage and infrastructure design capacity of the proposed retention and infiltration facilities will accommodate any existing runoff from the adjacent West Marin School property; and (3) the drainage and infrastructure design will be sized to accommodate runoff from paved roads and future development on the commercial parcel and the public parking parcel.

In addition, Condition 74 requires: (1) the capacity of the proposed retention facilities to be increased to accommodate surface runoff from the West Marin School; (2) surface runoff to be filtered prior to reaching the infiltration trenches to reduce contaminants and sediment that could clog the trench media (filtering devices may include, but not be limited to, biofilter strips and vegetated channels); and (3) additional protection against the failure of the infiltration trenches.

Infiltration trenches will be used to collect rainfall directly from roof downspouts and disperse the water into the permeable surface soils, much like a leach field system. Plastic infiltrator chambers underlain with drain rock will provide a large subsurface storage volume and sidewall areas for infiltration into the soils. The depth of the trenches will be limited to about 2 feet in the upper portions of the site (because of shallow soils and seasonal groundwater), but in the lower areas the trenches would typically be 4 to 6 feet deep.

Three-foot-deep infiltration trenches will be installed along the property line fronting Commodore Webster Drive in drainage Area C to collect, store, detain and disperse subsurface runoff from the roads and pathways. During small storms, all runoff will be infiltrated onsite; however, during long-duration, high-intensity storms the rate of runoff would, at some point, exceed the infiltration drainage capacity and flow from the property into the 12-inch storm drain located in Commodore Webster Drive.

In addition to the approved infiltration trenches, a rock drain trenches will be installed to collect surface runoff near the public parking lot and restroom area. These drainage trenches will have rock to the surface to allow overland flows to be captured for infiltration into the soil.

The drainage plan for the approved project also includes the use of grassed swales in the Williams Street Apartment area, along Williams Street, near the parking lot and the northern edge of the for-sale single-family affordable homes. The grass swales will increase rainwater infiltration near the source of the runoff and thus mimic existing hydrology. The infiltration trenches and grass swales in the Williams Street Apartment area will not extend within 100 feet of the wetlands and are designed to induce infiltration close to the runoff source.

A grassed-lined v-ditch will extend across the upper property line on the high slope above the Papermill Creek Homes. This V-ditch will serve to capture and divert any surface runoff from the Market Rate parcel around, rather that through the homes site. Runoff will be conveyed for final dispersal to the infiltration drainage trenched on the lower side of the homes.

The approved project includes provision for trapping and removal of sediment contained in site runoff to protect the subsurface infiltration drainage trenches as shown in Exhibit 5. The approved sedimentation facilities include several storm water interceptors and one, central sedimentation basin area. The storm water interceptors are entirely below ground concrete tanks

that provide for settling/collection of sediment as well as debris and oils. The sedimentation basin area, located immediately west of the Papermill Creek Apartments, will be a vegetated basin. The grassed swales in the Williams Street Apartment area will also provide sediment remove functions within the drainage channel itself.

3.0 APPEAL PROCESS

3.1 Local Government Action

On March 19, 2002, the Marin County Board of Supervisors approved a coastal development permit (CDP) for the development of the 36-unit mixed residential Point Reyes Affordable Housing project as further described in Section 2.2 above.

3.2 Filing of Appeal

On March 27, 2002, the Commission received notice of the County's final action approving a CDP for the project. The Commission's appeal period commenced the following working day and ran for ten working days from the Commission's receipt of the County's notice of final local action on March 27, 2002 (March 28 through April 11, 2002). On April 10, 2002 Commissioners Christina Desser and Mike Reilly submitted an appeal of the County's action approving the CDP. On April 11, 2002, the Commission received a second appeal from Elena Belsky, Mark Warner, and the Tomales Bay Association. Following receipt of each of these appeals, the Commission mailed a notification of appeal to the County and the applicant.

Pursuant to Section 30261 of the Coastal Act, the appeal hearing must be set within 49 days from the date that an appeal is filed. The 49th day from the first appeal filing date of April 10, 2002 is May 29, 2002. Accordingly, the appeal hearing is set for May 9, 2002.

3.3 Appeals Under the Coastal Act

After certification of Local Coastal Programs, the Coastal Act provides for limited appeals to the Coastal Commission of certain local government actions on coastal development permits (Coastal Act Section 30603).

Coastal Act Section 30603 provides, in applicable part, that an action taken by a local government on a CDP application may be appealed to the Coastal Commission for certain kinds of developments, including the approval of developments located within certain geographic appeal areas, such as those located between the sea and the first public road paralleling the sea, or within 300 feet of the mean high tide line or inland extent of any beach or top of the seaward face of a coastal bluff; or in a sensitive coastal resource area or located within 100 feet of any wetland, estuary, or stream. Developments approved by counties may be appealed if they are not designated as the "principal permitted use" under the certified LCP. Developments that constitute a major public works or a major energy facility may be appealed, whether they are approved or denied by the local government.

The approved development is not designated as the principally permitted use under the Marin County LCP and is located within 100 feet of wetlands, and thus meets the Commission's appeal criteria in Section 30603 of the Coastal Act. Pursuant to Section 30603 of the Coastal Act, an appeal for development in this location is limited to the allegation that the development does not conform to the standards set forth in the certified LCP or the public access policies set forth in the Coastal Act.

If the Commission decides to hear arguments and vote on the substantial issue question, proponents and opponents will have three minutes per side to address whether the appeal raises a substantial issue. The only persons eligible to testify before the Commission on the substantial issue question are the applicant, persons who made their views known before the local government (or their representatives), and the local government. Testimony from other persons regarding the substantial issue question must be submitted to the Commission or the Executive Director in writing.

It takes a majority of the Commissioners present to find that no substantial issue is raised. Unless it is determined that the project raises no substantial issue, the Commission will conduct a full de novo public hearing on the merits of the project at the same or subsequent hearing. If the Commission conducts a de novo hearing on the appeal, the applicable test under Coastal Act Section 30604 would be whether the development is in conformance with the certified Local Coastal Program.

3.4 Standard of Review

Public Resources Code Section 30625(b) states that the Commission shall hear an appeal unless it determines:

> With respect to appeals to the Commission after certification of a local coastal program, that no substantial issue exists with respect to the grounds on which an appeal has been filed pursuant to Section 30603.

The term *substantial issue* is not defined in the Coastal Act or its implementing regulations. The Commission's regulations simply indicate that the Commission will hear an appeal unless it "finds that the appeal raises no significant question." (14 CCR § 13115(b)). In previous decisions on appeals, the Commission has been guided by the following factors:

1. The degree of factual and legal support for the local government's decision that the development is consistent or inconsistent with the certified LCP and with the public access policies of the Coastal Act;
2. The extent and scope of the development as approved or denied by the local government;
3. The significance of the coastal resources affected by the decision;
4. The precedential value of the local government's decision for future interpretation of its LCP; and
5. Whether the appeal raises only local issues, or those of regional or statewide significance.

If the Commission chooses not to hear an appeal, appellants nevertheless may obtain judicial review of the local government's coastal permit decision by filing a petition for a writ of mandate pursuant to Code of Civil Procedure, Section 1094.5.

4.0 APPEAL OF BELSKY, WARNER AND TOMALES BAY ASSOCIATION

The appeal filed by appellants Belsky, Warner and Tomales Bay Association contends in general (the full text of the appeal is attached as Exhibit 6):

> The Project does not conform to Marin County's certified Local Coastal Program related to, without limitation, health and safety and natural resource preservation policies, in particular, septic systems, storm water and wastewater runoff and waterway preservation.

The appeal maintains that the approved development would not provide adequate wastewater and storm water management and treatment to prevent significant adverse impacts to coastal water quality, environmentally sensitive habitats, and human health in conflict with the water quality and habitat protection policies of the Marin County LCP. The appellants base these contentions on three reports prepared for the appellants by Fall Creek Engineering (FCE 2002a, FCE 2002b, FCE 2002c), and on a letter dated March 18, 2002, from the San Francisco Bay Regional Water Quality Control Board staff (RWQCB) to the Marin County Community Development Agency (Wolfe 2002a). Each of these documents is specifically incorporated as part of the appeal and are attached to the appeal document (see Exhibit 6).

4.1 Wastewater

4.1.1 Summary of Appellants' Contention

The appellants contend that the County's action on the CDP fails to adequately resolve issues related to the impacts of wastewater that would be generated by the approved development to water quality, sensitive coastal resources and human health. These contentions are based on three issues related to the effects of wastewater from the development, which the appellants summarize as follows:

1. The findings and conditions purportedly supporting and allowing approval of the Project do not demonstrate that there is sufficient "storage capacity" in the unsaturated soils (vadose zone) to accept additional wastewater and storm water applied to the property, and to prevent untreated or partially treated sewage effluent from surfacing during average and wet water year conditions.
2. The findings and conditions purportedly supporting and allowing approval of the Project do not demonstrate that the hydrologic investigation adequately assesses the potential water quality impacts to the North Marin Water District water supply wells and Lagunitas Creek.
3. The findings and conditions purportedly supporting and allowing approval of the Project do not demonstrate that onsite and cumulative impacts to groundwater and surface water quality from additional nitrates from the proposed wastewater systems have been adequately addressed.

4.1.2 Summary of Local Government Action

On February 2, 2000, the applicant submitted to Marin County applications for (1) a Countywide Plan amendment, (2) Community Plan amendment, (3) LCP amendment, (4) rezoning, (5) master plan, (6) precise development plan, (7) coastal development permit, and (8) subdivision for the approved development. The County determined these applications to be complete in May 2000, and circulated a Notice of Preparation of an environmental impact report (EIR) for the project on May 8, 2000. On August 14, 2000, the County held a public scoping session to help identify potential project impacts to be addressed in the project EIR. The County circulated a Draft EIR on May 9, 2001. The County responded to written and verbal comments received on the Draft EIR in the Final EIR published on November 29, 2001.

On January 14, 2002, the County Planning Commission unanimously recommended that the County Board of Supervisors determine that Mitigated Alternative Option 2 described in the EIR is the environmentally superior project alternative and certify the Final EIR. On January 29, 2002, the Board of Supervisors determined Mitigated Alternative Option 2 to be the environmentally superior project alternative and certified the EIR. Subsequent to the January 29, 2002 certification of the EIR, the applicant modified its application to conform to Mitigated Alternative Option 2.

At the January 29, 2002 Board of Supervisors hearing, John Sharp, representing the appellants, submitted an engineering report prepared by Fall Creek Engineering, Inc. dated January 28, 2002, contending that the County's action on the project does not adequately address potential significant water quality impacts including, the potential for surfacing of wastewater, contamination of North Marin Water District wells, impacts to Lagunitas Creek, cumulative impacts to ground and surface water from nitrates, and cumulative impacts related to storm water runoff and erosion. This is the same report attached as Exhibit A and incorporated as a part of the April 11, 2002 appeal of the CDP by Belsky, Warner and Tomales Bay Association (FCE 2002a).

The applicant's engineering consultant, Questa Engineering Corp., responded to the January 28, 2002 FCE report in a letter dated February 4, 2002 (Questa 2002a). This response was followed by another letter from FCE dated February 10, 2002, another response from Questa dated March 5, 2002, and a final letter from FCE dated March 18, 2002 (FCE 2002b; Questa 2002b; FCE 2002c). These letters/reports document disagreement between the two engineering consultants over the methodologies used to assess project impacts related to wastewater and polluted runoff. A technical review by the Commission's Water Quality Unit of the issues presented in these documents is contained in Appendix C.

In response to the issues raised by FCE, the County hired a third engineering consultant to conduct a peer review of the project engineering studies related to wastewater and polluted runoff impacts. The peer review confirmed the validity of the engineering analysis conducted by the applicant's consultant, Questa, stating in conclusion:

> Specifically, we find that our peer review of these documents do substantiate the findings and responses of Questa. Their responses are backed up with appropriate and substantiated data and are based on current State and County design parameters and standard of care engineering practices (PSOMAS 2002).

In a March 18, 2002 letter to the County Community Development Agency, the staff of the RWQCB stated:

> Based on our review of the proposed storm water and wastewater systems, we find that there are unresolved uncertainties including potential inadequate protection of beneficial uses of waters of the State. By modifying the project's proposed Conditions of Approval as indicated, we feel that beneficial uses of waters of the State will be protected, such that it will not be necessary for the Regional Board to request of [*sic*] Report of Waste Discharge for the project (Wolfe 2002a).

Accordingly, the County modified the conditions of approval as recommended by the RWQCB staff. On March 19, 2002, the Board of Supervisors adopted an addendum to the Final EIR incorporating all of the above-cited letters/engineering reports submitted by FCE, the responses from Questa and the peer review. At the same March 19, 2002, hearing, the County took final action approving the CDP for the approved development. The County conditions for approval of the CDP incorporated the RWQCB staff's recommended modifications.

In the findings for its final action, the County specifically addressed each of the issues identified by the appellants concerning potential impacts related to wastewater generated by the approved development to water quality, sensitive coastal resources, and human health. The County concluded that, as conditioned pursuant to its action on the CDP application, the approved development is consistent with the water supply, septic system, and stream and wetland

protection policies of the certified LCP. In particular, the County's final action on the CDP is supported by the following findings:

> As discussed in Section 4.4 (wastewater Treatment and Disposal) of this EIR, the proposed onsite wastewater treatment system would generally comply with [Marin County Environmental Health Services] MCEHS standards. Some components of the wastewater treatment system, such as sizing of certain septic tanks and leachfields [*sic*], do not meet MCEHS specifications. Implementation of Mitigation Measures 4.4-2, 4.4-3, 4.4-4, 4.4-5, 4.4-6, and 4.4-7 [Conditions 70, 71, 72, and 60] would ensure compliance with MCEHS standards. Marin County Environmental Health Services Division would maintain enforcement authority over the inspection, monitoring, and maintenance of the system in accordance with criteria adopted by the Regional [Water Quality Control] Board (Marin County 2001, 4.2-40).
>
> The Marin County Environmental Health Services [Department] has indicated that an up-to-code sewage disposal system could be constructed to service the proposed development (Marin County 2002a, 12).
>
> Although Lagunitas Creek is located within 400 feet of the southerly boundary of the subject property, the Environmental Impact Report found that the project would not result in significant, unmitigable [*sic*] impacts to the stream's resources (ibid).
>
> The project site is located approximately 400 feet north of Lagunitas Creek (at its closest point) and would have no direct impact on the creek or its fish and wildlife species. Based on the discussion of wastewater and drainage issues above, the project would not result in indirect impacts on the water quality of Lagunitas Creek (ibid, 13).

4.1.3 Applicable Policies

The Marin County Unit II LUP Public Services and New Development Section Policy 3 states:

3. Sewage disposal.

   a. On-site sewage disposal. All on-site sewage disposal systems in the coastal zone shall be evaluated as follows:

      (1) Septic systems. All septic systems shall meet the standards contained in either the Minimum Guidelines for the Control of Individual Wastewater Treatment and Disposal Systems adopted by the Regional Water Quality Board on April 17, 1979 or the County's revised septic system code, when approved by the Regional Board. No waivers shall be granted unless a public entity has formally assumed responsibility for inspecting, monitoring, and enforcing the maintenance of the system in accordance with criteria adopted by the Regional Board, or such waivers have otherwise been reviewed and approved by the Regional Board. (See Appendix C)

      (2) Expansions or alternations. Where a coastal development permit is necessary for an enlargement or change in the type or intensity of use of an existing structure, the existing or enlarged septic system must meet the Minimum Guidelines of the Regional Water Quality Control Board, or the County's revised septic system code as approved by the Regional Board, before a permit for such enlargement or change can be granted.

      (3) Reconstruction of existing systems. A septic system or other sewage disposal facility which served a residential dwelling damaged or destroyed by natural disaster may be rebuilt along with the reconstruction of the dwelling. If the

septic system or other facility is substandard, every effort shall be made to bring it into conformance with County Code.

(4) Alternative systems. The County recommends that provisions be included in the County code to allow alternative sewage disposal systems to be utilized. Until such provisions are incorporated into the code and approved by the Regional Water Quality Control Board however, alternative systems shall only be permitted where a public entity has formally assumed responsibility for inspecting, monitoring, and enforcing the maintenance of the systems in accordance with criteria adopted by the Regional Board

(5) Maintenance. The County supports the establishment of a septic tank maintenance district(s) in the coastal zone for the purpose of monitoring and inspecting septic systems there. To provide for inspection of existing systems not now subject to periodic review under County Code, the County shall investigate the inspection of a septic system upon resale of the associated single-family dwelling.

Marin County Zoning Code Section 22.56.130(B) provides:

> Septic System Standards: The following standards apply for projects which utilize septic systems for sewage disposal.
>
> 1. All septic systems within the coastal zone shall conform with the Minimum Guidelines for the Control of Individual Wastewater Treatment and Disposal Systems adopted by the Regional Water Quality Board on April 17, 1979 or Marin County Code whichever is more stringent. No waivers shall be permitted except where a public entity has formally assumed responsibility for inspecting, monitoring, and enforcing the maintenance of the system in accordance with criteria adopted by the Regional Water Quality Board, or where waivers have otherwise been reviewed and approved under standards established by the Regional Water Quality Board.
>
> 2. Alternative waste disposal systems shall be approved only where a public entity has formally assumed responsibility for inspecting, monitoring, and enforcing the maintenance of the systems in accordance with criteria adopted by the Regional Water Quality Control Board
>
> 3. Where a coastal development permit is necessary for an enlargement or change in the type or intensity use of an existing structure, the project's septic system must be determined consistent with the current guidelines of the Regional Water Quality Control Board, or such other program standards as adopted by the County of Marin.

Pursuant to Marin County Code Chapter 18.06, the County has adopted regulations for the design, construction and repair of individual sewage disposal systems (see Appendix B). These regulations have been approved by the RWQCB as consistent with the State Policy on Discrete Sewage Facilities (RWQCB Resolution 78-14) and Minimum Guidelines for the Control of Individual Wastewater Treatment and Disposal Systems (RWQCB Resolution 79-5). These regulations, which constitute the coastal development permit standards for septic systems in the County, include the following provisions relevant to the Commission's consideration of the appeal:

400 SITE SUITABILITY CRITERIA

401 Setbacks

Minimum horizontal distances between the septic tank and drainfield system and various physical site features shall be as follows:

Site Feature	Setback to Septic Tank	Setback to Edge of Drainfield
Building	5 feet	10 feet
Adjoining Property Line (1)	5 feet	5 feet
Downslope Property Line (1)	10 feet	25 (5)
Wells (domestic or non-domestic)	100 feet	100 feet
Perennial Watercourse (2)	50 feet	100 feet
Ephemeral Watercourse (2) or Seasonal Wetland	50 feet	75 feet
Intermittent Watercourse (2)	50 feet	50 feet
Natural Lake or Water Supply Reservoir (3)	100 feet	200 feet
Ocean, Bay or Tidal Estuary (4)	50 feet	100 feet
Edge of Drainfield Pipe	5 feet	
Cut, Embankment or Natural Bluff	10 feet	4h (6)
Unstable Land Form	50 feet	50 feet
Swimming Pool	10 feet	25 feet
Domestic Water Line	10 feet	10 feet
Driveway or Paved Surface	5 feet	5 feet

(1) Where the property line extends into a public roadway easement the setback shall be measured from the near edge of the easement

(2) Distances shall be measured from the top edge of the bank.

(3) Distances shall be measured from the high-water line.

(4) Distances shall be measured from the mean higher-high-water line.

(5) Setback distance shall be 50 feet if the property line is one where there is a reasonable chance that a cut bank could be excavated for house or road construction.

(6) Distance in feet equals four times the vertical height of the cut, embankment or bluff or 50 feet, whichever is less, but in no case less than 25 feet or more than 100 feet. Distances shall be measured from the top edge of the cut, embankment or bluff. Where an impermeable layer intersects a cut, and natural seepage is evident, the setback shall be 100 feet from the cut, unless it can be demonstrated that other site factors (e.g., soil depth) adequately protects against lateral seepage of untreated effluent.

402 Depth to Groundwater

Minimum depth to the anticipated highest seasonal level of groundwater below the bottom of the drainfield trench shall be as follows:

Percolation Rate (Min/inch)		Soil Texture (% Silt + Clay) [1]	Minimum Depth to Seasonally High Groundwater (ft.)
Slower than 5 or		More than 15	3[2]
1 to 5	and	10 to 15	10
1 to 5	and	less than 10	20
Faster than 1			system prohibited

1. Soil of this texture or finer must exist for a minimum of three (3) continuous feet between the bottom of the drainfield trench and the water table.
2. A minimum of 2 feet may be granted only as a variance of for certain alternative systems.

807. Cumulative Impact Assessment

...

E. **Methods**

...

1. **Nitrate Loading.** Criteria for evaluating the cumulative nitrate loading of alternative systems shall be as follows:

   a. **For Areas Served by Water Wells.**

      (1) Alternative systems, on existing lots or subdivisions, shall not cause the groundwater nitrate-nitrogen concentration to exceed 7.5 mg/l (as N) at the nearest existing or potential point of groundwater withdrawal.

      <u>and</u>

      (2) The total loading of nitrate from new subdivisions shall not result in an average groundwater nitrate-nitrogen concentration, over the geographical extent of the subdivision, that exceeds 7.5 mg/l (as N).

   b. **For Areas Not Served By Water Wells**

      (1) Alternative systems, on existing lots or subdivisions, shall not cause the groundwater nitrate-nitrogen concentration to exceed 10.0 mg/l (as N) at the nearest existing or potential point of groundwater withdrawal.

      <u>and</u>

      (2) The total loading of nitrate from new subdivisions shall not result in an average groundwater nitrate-nitrogen concentration, over the geographical extent of the subdivision, that exceeds 10 mg/l (as N).

In addition to the above-cited LUP and Zoning policies and sewage disposal regulations, Marin County LCP Amendment 1-MAJ-02 incorporates the County's conditions of approval as site-specific LCP implementation standards for the project site. Once certified by the Commission, these implementation measures, along with the existing provisions of the LCP, form the standard of review for any CDP for development of the site. Thus, the CDP for the approved development is conditioned to and must conform to the following provisions:

5. Future development and use of all portions of the property shall be subject to the following restrictions and conditions:

   ...

   C. Landscaping, low height fencing, boulders, and/or signs shall be utilized to discourage vehicular access into or parking over the septic leachfields associated with the Williams Street Apartments, Papermill Creek Apartments, and the future public restrooms and visitor-serving commercial use.

23. PRIOR TO RECORDATION OF THE FINAL MAPS FOR THE RESIDENTIAL OR VISITOR-SERVING USES, APPROVAL OF THE SUBDIVISION IMPROVEMENT AGREEMENT, OR ISSUANCE OF A GRADING PERMIT, whichever occurs first, the following items shall be submitted to the Planning Division:

    ...

    C. A letter from the North Marin Water District which acknowledges receipt of written confirmation from the agencies with regulatory oversight over the District's water supply wells that all precautionary measures have been incorporated into the design of the project's wastewater systems to minimize potential contamination of the Water District's wells; and

    D. A letter from the Environmental Health Services Division which confirms that sufficient information has been provided by the project engineer to support the methodology and assumptions that form the bases for the design of the wastewater and stormwater systems and which confirms that the design would adequately address the following concerns: (1) adequacy of the design to adequately handle wastewater and stormwater runoff; (2) the adequacy of the hydrogeologic investigation to address concerns relating to viral contamination of Lagunitas Creek; (3) the potential for nitrate contamination of Lagunitas Creek; and (4) the adequacy of the site to accept post-development stormwater run-off. This letter should include written documentation of compliance with County regulations by the Environmental Health Services Division for on-site wastewater systems for all components and aspects of the designs. The compliance letter shall be submitted to the Regional Water Quality Control Board for review and approval by the Regional Board Executive Officer.

57. PRIOR TO ISSUANCE OF A BUILDING PERMIT, the applicant shall obtain the necessary construction permits for the septic systems and comply with all permitting conditions related to the permits. The permit approvals include either a renewable operating permit issued by Environmental Health Services, or Waste Discharge Requirements or waiver thereof issued by the Regional Water Quality Control Board.

58. In addition to standard requirements for routine inspection and maintenance, An Operation, Maintenance, and Monitoring Program and Contingency Plan shall be required for the

project. The plan shall include provisions for water quality monitoring, repair/replacement of malfunctioning equipment, and other remedial measures to handle unexpected problems with the septic leachfields and to prevent contamination of groundwater sources. The plan should include a complete description of all equipment and components of the system, a description of how the system and relevant individual components are intended to work, and all activities needed or recommended in order to ensure proper system performance. The plan should identify procedures for conducting monitoring of ground water quality upslope, within, and downslope of the project site, and other ambient conditions (e.g. rainfall and groundwater levels) in order to demonstrate compliance with original wastewater system design criteria. The contingency component of the plan should include actions to be taken in the event of malfunctioning equipment or system, of unexpected problems, or that the system does not comply with design criteria or ambient condition criteria. The plan should identify the responsible party for the system, how identified plan actions will be implemented, and how identified contingency actions will be funded. The plan shall be submitted for review and approval by the Community Development Director and the Regional Board Executive Officer for the Regional Water Quality Control Board, in consultation with the North Marin Water District, PRIOR TO RECORDATION OF THE FINAL MAP.

A. provisions for water quality monitoring, repair/replacement of malfunctioning equipment, and other remedial measures to handle unexpected problems with the septic leachfields and to prevent contamination of groundwater sources;

B. a complete description of all equipment and components of the system, a description of how the system and relevant individual components are intended to work, and all activities needed or recommended in order to ensure proper system performance;

C. procedures for conducting monitoring of ground water quality upslope, within, and downslope of the project site, and other ambient conditions (e.g. rainfall and groundwater levels) in order to demonstrate compliance with original wastewater system design criteria;

D. actions to be taken in the event of malfunctioning equipment or system, of unexpected problems, or that the system does not comply with design criteria or ambient condition criteria;

E. the responsible party for the system;

F. how identified plan actions will be implemented; and

G. how identified contingency actions will be funded.

59. In order to enhance the operation of the septic system and minimize costs for maintenance and repair, the use of kitchen sink garbage disposal units is discouraged in the Papermill Creek Homes, Papermill Creek Apartments, and the Williams Street Apartments. The applicant shall include this restriction as part of the disclosure documents to potential buyers and renters of the homes. PRIOR TO FINAL INSPECTION OF EACH SEPTIC SYSTEM, the Environmental Health Services staff shall conduct an inspection to verify that the kitchens are not equipped with kitchen sink garbage disposal units.

60. When the septic system for the future visitor-serving commercial parcel is designed, it shall be designed to comply with Environmental Health Services regulations.

65. The project shall comply with North Marin Water District's water conservation Regulation 17. This regulation includes requirements for low flow plumbing fixtures, installation of laundry facility washing machines that are Energy Star Rated and restrictions on turf irrigation.

70. PRIOR TO ISSUANCE OF A CONSTRUCTION PERMIT FOR THE SEWAGE DISPOSAL SYSTEM, and in order to comply with county standards for septic tank design, a two-inch vent on the baffle wall of all septic tanks shall be constructed by the applicant. (Wastewater Treatment #4.4-2 and #4.5-14)

71. PRIOR TO ISSUANCE OF A CONSTRUCTION PERMIT FOR THE SEWAGE DISPOSAL SYSTEM, the dosing chambers and overflow tanks for the pressurized systems shall be sized to accommodate the peak day wastewater generation volume for the corresponding land use to ensure compliance with County standards. (Wastewater Treatment #4.4-3 and #4.5-14)

    A. High water alarms shall be installed in all wastewater pumping systems, in accordance with County standards, to alert the operator or maintenance staff of a high level in the pump tank;

    B. All pumping systems shall include provisions for extended operation during general power outages using a portable emergency generator; and

    C. Scheduled and emergency maintenance of pressurized systems shall be performed by a licensed septic system, pump, or plumbing contractor, septic system pumping service, or other qualified maintenance person as identified in an Operating Permit, if issued for the system by the County.

72. PRIOR TO ISSUANCE OF A CONSTRUCTION PERMIT FOR THE SEWAGE DISPOSAL SYSTEM, and to comply with county standards for septic tank design, the project shall include septic tank capacity sufficient to provide 2 days of detention volume for all parcels. (Wastewater Treatment, #4.4-4 and #4.5-14)

73. There are two methods available to ensure compliance with MCEHS sizing standards for the public restroom septic tank and leach field. PRIOR TO ISSUANCE OF A CONSTRUCTION PERMIT FOR THE SEWAGE DISPOSAL SYSTEM, the project proponent shall design the project's wastewater treatment system for the public restrooms according to one of the following. (Wastewater Treatment, #4.4-5, #4.5-9, and #4.5-14)

    A. Ultra low flush urinals and very low flow toilets that generate an average of 2 gpd/person or less shall be used for the public restrooms.

    B. Low flow fixtures that generate an average of 3.5 gpd/person or less shall be used, a 2,500-gallon septic tank shall be installed, and a 5,040 square-foot leachfield shall be constructed for the public restrooms. The project sponsor shall provide documentation to MCEHS sufficient to demonstrate compliance with MCEHS standards for leachfield sizing.

4.1.4 Substantial Issue Analysis

In consideration of whether the appellants' contentions concerning the impacts of wastewater generated by the approved development raise a substantial issue of conformity with the Marin County LCP, the Commission is guided by the five factors described in Section 3.4 above. In

this instance, the Commission finds that Factor 1, the degree of factual and legal support for the local government's decision that the development is consistent with the certified LCP, especially supports the determination that the appeal raises no substantial issue.

Through its review and final action on the approved development, the County considered each of the issues raised by the appellants concerning potentially significant adverse impacts related to wastewater treatment and disposal. The County concluded that by conditioning the CDP to require certain modifications to the design of the wastewater treatment system and to impose rigorous inspection, maintenance, and monitoring requirements, the approved development would not significantly impact coastal water quality, environmentally sensitive habitat areas, or human health in conformity with the above-cited policies of the Marin County LCP.

The County's action is supported by a letter from the staff of the RWQCB (Wolfe 2002a). In this letter, the RWQCB staff recommended certain modifications to the County's conditions of approval to address unresolved uncertainties concerning potential water quality impacts to groundwater, wetlands, Lagunitas Creek, and Tomales Bay. Accordingly, the County modified Conditions 57 and 58 (renumbered from 54 and 55) to address these concerns as recommended by the RWQCB staff. In a subsequent letter dated April 24, 2002, the RWQCB staff concludes:

> The purpose of this letter is to confirm that recommendations regarding conditions of approval for the Point Reyes Affordable Homes Project, as stated in our March 18, 2002, letter to the County of Marin, were sufficiently incorporated into the County's Conditions of Approval for the Project, which were adopted by the Marin County Board of Supervisors on March 19, 2002 (Wolfe 2002b).

The County's action is also supported by the third engineering consultant that conducted a peer review of the appellants' and the applicant's engineering studies related to wastewater and polluted runoff impacts. The peer review confirmed the validity of the engineering analysis conducted by the applicant's consultant, Questa, stating in conclusion:

> Specifically, we find that our peer review of these documents do substantiate the findings and responses of Questa. Their responses are backed up with appropriate and substantiated data and are based on current State and County design parameters and standard of care engineering practices (PSOMAS 2002).

The Commission's Water Quality Unit has reviewed the technical studies concerning water quality impacts of the project and the engineering and design criteria for the project wastewater treatment system contained in the County's administrative record, the conditions of approval as modified pursuant to the RWQCB recommendations, and the engineering reports submitted in support of the appeal. The Commission's Water Quality Unit also believes that the evidence in the local record supports the County's determinations in approving the project as conditioned. A summary of this analysis is provided below. The Water Quality Unit's detailed technical review of the relevant data is contained in Appendix C.

Depth to Groundwater

As cited above, the LCP includes policies and regulations to prevent contamination of groundwater resources from sewage disposal systems. Pursuant to Section 402 of the County's sewage disposal regulations, the minimum depth to the anticipated highest seasonal level of groundwater below the bottom of a septic system drainfield trench is determined based on the soil percolation rate and the soil type. In accordance with the County's sewage disposal

regulation Sections 502 and 503, Questa performed a soil profile inspection and percolation tests. Based on the resulting data, the County determined that the required minimum depth to the anticipated highest seasonal level of groundwater for the project site is three feet.

To determine the anticipated highest seasonal level of groundwater below the septic system drainfield trenches, Questa performed wet weather testing in accordance with the County's sewage disposal regulation Sections 504. Questa observed groundwater levels from monitoring wells and numerous backhoe test pits excavated after prolonged periods of rain, representative of seasonal high groundwater levels. Questa also conducted a groundwater mounding[1] analysis based on observed seasonal high groundwater levels and a derived hydraulic conductivity factor[2]. Questa derived the hydraulic conductivity factor used in its groundwater mounding analysis from percolation tests performed at the depth where mounding is most likely to occur. Questa's groundwater mounding study shows that adequate separations to groundwater will be provided with the proposed leach field design consistent with the requirements of the LCP (Questa 2002a). Applicable Marin County Sewage Disposal Regulations allow for a reduction in the minimum depth to seasonably high groundwater of up to 50% with groundwater mounding conditions.

The appellants' consultant, FCE, challenges the validity of Questa's conclusions regarding the anticipated highest seasonal level of groundwater based on the following contentions:

- The groundwater mounding study deals only with wastewater but not storm water.
- There may be interaction between the wastewater and storm water despite the 50-foot separation between the two kinds of infiltration trenches.
- FCE used the specific percolation test results from the various areas in the lower east side to arrive at a hydraulic conductivity of 7.2 ft/day, not 20 ft/day as claimed by Questa. (FCE used percolation rates from a variety of depths.)
- Because the data used to determine the depth to groundwater at the proposed leach field locations were gathered from wells drilled into the bedrock with bentonite and cement seal from the groundwater surface to at least 11 feet deep, the groundwater level thus measured cannot truly represent the water table above the confining layer.
- It is technically invalid for Questa to directly convert percolation rates into hydraulic conductivities. Instead, FCE provides two regression equations for the two parameters. Results using these two equations show that at least four septic systems will become flooded and the lower leach field for the Papermill Creek Apartments would fail during periods of high groundwater.

  (FCE 2002a, FCE 2002b, FCE 2002c)

As provided in Appendix C, the Commission's Water Quality Unit has reviewed the relevant data and concurs that the evidence in the local record supports the County's determination that the approved development conforms to Unit II LUP Public Services and New Development Section Policy 3, Zoning Code Section 22.56.130(B), and the County's sewage disposal

[1] An outward and/or upward expansion of the free water table caused by groundwater recharge.
[2] A measure of the rate at which water will move through a permeable soil or rock layer. For a particular soil or rock layer, the hydraulic conductivity may not be the same in the horizontal direction as in the vertical direction.

regulations. Following is a summary of the Water Quality Unit's analysis contained in Appendix C.

The evidence in the local record provided by Questa supports the County's determination that the highest seasonal groundwater conditions do not occur underneath the proposed leach fields. The higher groundwater levels tend to occur in the upper portions of the project site. In regard to the alleged inappropriateness of relying on groundwater levels observed in the monitoring wells because these wells were potentially measuring levels of a confined aquifer, Questa confirmed the observed groundwater levels in the monitoring wells with additional water levels obtained from numerous backhoe test pits.

In comparison, FCE's water budget (infiltrated rainwater plus wastewater) analysis comparing the estimated annual flow input with the unsaturated zone's water holding capacity at a single instant does not take into account that a real life groundwater regime is a dynamic system that allows flows into and out of the system continuously. It was reasonable for the County to rely on Questa's drainage calculations using the 100-year, 24-hour storm represent a conservative (safe) approach to evaluate the ground's ability to absorb a sudden increase in water input during and immediately after larger-than-normal storms. The 100-year, 24-hour design storm already represents rain events much higher in volume than past storm water best management practice (BMP) design requirements imposed by the Commission and others, and certainly higher in volume than the average rainfall events as well. Compliance with this requirement would exceed compliance with the more widely accepted 85th percentile, 24-hour design storm requirement. It is neither necessary nor appropriate to expect a water holding capacity large enough to hold the system's one entire year's worth of inflow, with the assumption of zero outflow.

The evidence supports the County's decision to reject FCE's contention that Questa's groundwater mounding study only takes into account wastewater. Contrary to FCE's contention, Questa's groundwater mounding study takes into account both wastewater and storm water contributions to the groundwater system. High seasonal groundwater levels were observed at the end of the last El Nino winter in April 1998 and then in March 2000, following a February with 140% of normal precipitation. The predicted groundwater rise, based on wastewater flow, in the mounding analysis is subtracted from the available unsaturated soil depth to arrive at a predicted net separation to groundwater. This figure is then compared with the required separation to determine if a system complies with the County's septic code. As discussed in Section 4.2 below, the County conditions of approval, including in particular Condition 46, ensure that the total post-development rainwater/storm water contribution to the site's subsurface will not vary significantly from the pre-development conditions due to the 100-year, 24-hour design storm used for storm water BMPs. Thus, while Questa's claim that runoff upslope of leach fields is collected and infiltrated 50 feet below the leach fields is only true for certain areas, storm water infiltration upslope does not change the groundwater mounding conditions underneath the leach fields because the overall rainwater available in the subsurface of the leach field areas will remain similar under both pre- and post-development conditions.

Therefore, the groundwater mounding study conducted by the applicant's consultant and confirmed by the County's third party peer review demonstrates adequate separations to groundwater for the leach fields consistent with the LCP. As further discussed below, Condition 58 of the County's permit provides an added level of protection because the post-development monitoring program to be implemented will assess and verify compliance with the County's

required separation to groundwater and validity of the mounding analysis conducted. The program will include monitoring wells installed both up gradient and down gradient of the leach fields, and within the leach fields as well. In accordance with Condition 58, the applicant will reanalyze potential groundwater mounding for the leach fields in the event that some of the wastewater flows are to be redirected to fields with predicted excess capacities in response to unanticipated problems.

Nitrate Loading

In accordance with County Sewage Disposal Regulation Section 807 of the County's Regulations concerning alternative sewage disposal systems sets criteria for evaluating the cumulative nitrate loading of alternative systems. Pursuant to Section 807(E)(1), in areas served by water wells, the total loading of nitrate from new subdivisions shall not result in an average groundwater nitrate-nitrogen concentration, over the geographical extent of the subdivision that exceeds 7.5 mg/l (as N). In areas not served by water wells, the total loading of nitrate from new subdivisions shall not result in an average groundwater nitrate-nitrogen concentration, over the geographical extent of the subdivision, that exceeds 10 mg/l (as N). Although it appears that these standards apply only to alternative sewage disposal systems and not to standards leach field systems, the County's findings for the CDP show that both the standard and alternative systems of the approved development will conform to these cumulative nitrate-loading standards and that the approved development will not result in significant cumulative nitrate-loading impacts to Lagunitas Creek or existing public water wells of the North Marin Water District.

The appellants' consultant, FCE, contends that the County's findings concerning cumulative nitrate-loading impacts are flawed because:

- The nitrate loading analysis presented in the feasibility report considers whether the groundwater concentration of nitrate-nitrogen in certain target zones would exceed 10 mg/l of various scenarios of wastewater discharge. Lagunitas Creek was not one of the target zones considered. There needs to be an analysis of whether any nitrate would enter the creek because of the project and if it did what would be the impact.
- Questa failed to estimate nitrate loading using the most current and a higher estimated wastewater loading from the site. If the most up-to-date number were used, the computed nitrate-nitrogen concentration at the downgradient edge of the property would exceed 10 mg/L in an average year with 10% runoff.
- It was unrealistic to assume a complete mixing of a year's wastewater with all the groundwater recharged on the entire site within one average year in performing the nitrate loading analysis. Questa failed to provide any explanation on how this mixing can be achieved.
- A more thorough analysis of potential impacts to the NMWD wells should be conducted.

The evidence in the record, including evidence provided by the applicant's consultant and confirmed by the County's third party peer review, supports the County's determination that the cumulative nitrate impact on Lagunitas Creek and the North Marin Water District wells will be insignificant for the following reasons:

In accordance with Condition 46 of the CDP, the approved development will provide for on site infiltration of the runoff generated from the 100-year, 24-hour design storm. This volume of

storm water infiltration will ensure that the overall rainwater contribution to the subsurface will not decrease after development. The infiltrated rainwater will provide substantial dilution of nitrate concentration.

Cumulative nitrogen contribution from the post-development wastewater flow on the site's eastern portion represents roughly a 54% increase from the current nitrogen loading resulting from onsite horse grazing and the West Marin School. Previous monitoring using onsite and offsite wells showed the average onsite concentration to be 2.4 mg-N/L, compared to the average concentration of 0.3 mg-N/L for the four off-site wells. The decrease in concentration from onsite to offsite locations confirmed the natural nitrate attenuation capacity available in the subsurface.

There are 10+ acres of wetland meadow and riparian woodland between the project site and Lagunitas Creek, representing an approximately 450-foot horizontal setback from the creek. This area will provide soil denitrification and vegetative uptake of nitrate. Questa estimates a minimum of 1,310 lb per year nitrogen removal capacity for this area, more than enough to handle the predicted combined loading of 705 pounds from the site's eastern portion and the West Marin School.

In addition, the post-development monitoring program required by the County pursuant to Condition 58 will further ensure the minimization of offsite nitrate migration. Accordingly, any exceedance of the established nitrate-nitrogen action levels will trigger implementation of the required contingency plan. Relevant contingency measures include diversion of problematic wastewater flows to the reserve fields and/or the construction of pretreatment systems to improve the denitrification capacity and efficiency of the septic systems. These contingency measures will further reduce nitrate discharge as needed to correct any potential exceedence.

North Marin Water District Wells

The closest septic leach field associated with the approved development is located approximately 700 feet from three public water supply wells (only two of which are currently in use) operated by the North Marin Water District (NMWD). As such, the County found that the approved septic system satisfies the 100-foot setback requirement for water wells contained in Section 401 of the County Sewage Disposal Regulations. However, the appellants contend that the County's findings and conditions do not demonstrate that the hydrologic investigation adequately assesses the potential water quality impacts to the NMWD water supply wells.

The appellants' consultant, FCE, contends that the County's findings concerning potential microbial contamination of public drinking water supplies are inadequate because:

- In determining the zone of contribution[3] to the NMWD wells, the County only considered pre-project conditions.
- The estimated pre-project groundwater travel time to the NMWD wells of 2.5 years may pose a significant threat of viral contamination to the water supply.

However, FCE later conceded that "[c]onsidering the topography and geology of the area" the water from the project site will not be captured by the NMWD wells under any circumstance.

[3] The area surrounding a pumping well that encompasses all areas or features that supply groundwater recharge to the well.

The Commission's Water Quality Unit has reviewed the relevant data and concludes that except for the far eastern corner, the site lies essentially outside the Zone of Contribution to the NMWD wells. The estimated travel time for any groundwater to the wells of 2.5 years complies with the Department of Health Services' Microbial/Direct Chemical Contamination Zone criterion, which calls for a minimum time-of-travel of two years to ensure protection of drinking water supplies from viral and bacterial contamination. Therefore, the evidence reviewed by the Water Quality Unit supports the County's determination that the approved development is consistent with the provisions of the certified LCP concerning protection of public drinking water supplies.

4.1.5 Conclusion -- Wastewater

While there is disagreement between the applicant's and the appellants' consultants concerning some of the methodologies used to assess potential wastewater impacts, consistent with the determination of the staff of the RWQCB and the County's third party peer review, the County's conditions of approval as modified are adequate to fully address any outstanding issues related to wastewater.

As more fully addressed in Appendix C, the key County condition of approval addressing unresolved wastewater impacts is Condition 58. As modified in accordance with the specific recommendations of the RWQCB staff, Condition 58 requires "An Operation, Maintenance, and Monitoring Program and Contingency Plan" subject to the review and approval of the RWQCB Executive Officer. In accordance with this condition:

> The plan should identify procedures for conducting monitoring of ground water quality upslope, within, and downslope of the project site, and other ambient conditions (e.g. rainfall and groundwater levels) in order to demonstrate compliance with original wastewater system criteria. <u>The contingency component of the plan should include actions to be taken in the event of malfunctioning equipment or system, of unexpected problems, or [of a determination] that the system does not comply with design criteria or ambient condition criteria</u>. The plan should identify the responsible party for the system, how identified plan actions will be implemented, and how identified contingency actions will be funded [*emphasis added*].

In order to be consistent with the LCP, the County's action on the approved development must fully resolve any remaining uncertainties concerning the wastewater impacts of the approved development in a manner that would ensure the prevention of significant adverse impacts to water quality, sensitive habitats, and human health. Condition 58 goes beyond the County's routine inspection and maintenance standards for individual wastewater treatment systems by requiring more rigorous monitoring and by including a requirement for a contingency plan to address unexpected problems.

In evaluating the effectiveness of this condition to protect coastal resources from potential impacts, it is important to understand whether feasible contingency measures adequate to respond to unexpected problems exist. This question is addressed, in part, by an outline of anticipated monitoring and contingency measures provided to the County by the applicant prior to its action on the CDP application (Questa 2002d). However, given the requirement of Condition 58 that a contingency plan be developed to ensure satisfaction of all design and ambient condition critera, a more complete evaluation of contingency measures will be required to satisfy Condition 58. The Commission's Water Quality Unit has discussed the contingency plan requirement of Condition 58 with County and RWQCB staff and has determined that feasible measures are available to adequately respond to unexpected wastewater impacts whether

due to system design or operational flaws or unanticipated or changed environmental conditions. Such contingency measures include for example:

- installation of pretreatment devices, and
- effluent diversion to designated reserve leach field sites.

In addition to imposing rigorous monitoring, inspection, and maintenance requirements and requiring identification of contingency measures to address unanticipated problems, Condition 58 provides an additional level of certainty that these requirements will be fully implemented by requiring the applicant to identify the responsible party for the system and how approved plan actions would be funded and implemented. Taken together, the provisions of Condition 58, along with the other County conditions of approval, provide a high degree of certainty that the approved development will be undertaken in conformity with the water quality and habitat protection policies of the Marin County LCP.

As shown above and as further discussed in Appendix C, the information reviewed by the Commission's Water Quality Unit supports the County's findings concerning wastewater impacts of the approved development. In addition, the County's final action on the CDP application is conditioned to resolve all outstanding issues related to potential water quality impacts to the satisfaction of the staff of the RWQCB and the Commission's Water Quality Unit. Therefore, the Commission finds that the degree of factual and legal support for the County's decision that the development is consistent with the certified LCP supports the determination that the appeal raises no substantial issue of conformity of the approved development with respect to the above-cited grounds concerning wastewater impacts.

4.2 Polluted Runoff

4.2.1 Summary of Appellants' Contention

The appellants contend that the County's action on the CDP fails to adequately resolve issues related to the impacts of polluted runoff to water quality and sensitive habitats. These contentions are based on two issues, which the appellants summarize as follows:

1. The findings and conditions purportedly supporting and allowing approval of the Project do not demonstrate that there is sufficient "storage capacity" in the unsaturated soils (vadose zone) to accept additional wastewater and storm water applied to the property ...

4. The findings and conditions purportedly supporting and allowing approval of the Project do not demonstrate cumulative impacts to surface water from potential impacts from plan storm water runoff and erosion have been adequately addressed.

4.2.2 Summary of Local Government Action

On February 2, 2000, the applicant submitted to Marin County applications for (1) a Countywide Plan amendment, (2) Community Plan amendment, (3) LCP amendment, (4) rezoning, (5) master plan, (6) precise development plan, (7) coastal development permit, and (8) subdivision for the approved development. The County determined these applications to be complete in May 2000, and circulated a Notice of Preparation of an environmental impact report (EIR) for the project on May 8, 2000. On August 14, 2000, the County held a public scoping session to help identify potential project impacts to be addressed in the project EIR. The County circulated a Draft EIR on May 9, 2001. The County responded to written and verbal comments received on the Draft EIR in the Final EIR published on November 29, 2001.

On January 14, 2002, the County Planning Commission unanimously recommended that the County Board of Supervisors determine that Mitigated Alternative Option 2 described in the EIR is the environmentally superior project alternative and certify the Final EIR. On January 29, 2002, the Board of Supervisors determined Mitigated Alternative Option 2 to be the environmentally superior project alternative and certified the EIR. Subsequent to the January 29, 2002, certification of the EIR, the applicant modified its application to conform to Mitigated Alternative Option 2.

At the January 29, 2002 Board of Supervisors hearing, John Sharp, representing the appellants, submitted an engineering report prepared by Fall Creek Engineering, Inc. dated January 28, 2002, contending that the County's action on the project does not adequately address potential significant water quality impacts including, the potential for surfacing of wastewater, contamination of North Marin Water District wells, impacts to Lagunitas Creek, cumulative impacts to ground and surface water from nitrates, and cumulative impacts related to storm water runoff and erosion. This is the same report attached as Exhibit A and incorporated as a part of the April 11, 2002 appeal of the CDP by Belsky, Warner and Tomales Bay Association (FCE 2002a).

The applicant's engineering consultant, Questa Engineering Corp., responded to the January 28, 2002 FCE report in a letter dated February 4, 2002 (Questa 2002a). This response was followed by another letter from FCE dated February 10, 2002, another response from Questa dated March 5, 2002, and a final letter from FCE dated March 18, 2002 (FCE 2002b; Questa 2002b; FCE 2002c). These letters/reports document disagreement between the two engineering consultants over the methodologies used to assess project impacts related to wastewater and polluted runoff. A technical review by the Commission's Water Quality Unit of the issues presented in these documents is contained in Appendix C.

In response to the issues raised by FCE, the County hired a third engineering consultant to conduct a peer review of the project engineering studies related to wastewater and polluted runoff impacts. The peer review confirmed the validity of the engineering analysis conducted by Questa, stating in conclusion:

> 3. While storm flow events in excess of the design event (100 year, 24 hour) will influence the ground water and wastewater systems... Storm flows greater than these standards will produce some offsite runoff. This runoff, however, would not include the agricultural constituents contained in the current runoff. In addition, runoff from the earlier stages (i.e., first flush) of events larger than the design event would be treated, and the project would result in no increase in post-development runoff volumes from the design event.
>
> 4. Specifically, we find that our peer review of these documents do substantiate the findings and responses of Questa. Their responses are backed up with appropriate and substantiated data and are based on current State and County design parameters and standard of care engineering practices (PSOMAS 2002).

In a March 18, 2002 letter to the County Community Development Agency, the staff of the RWQCB stated:

> Based on our review of the proposed storm water and wastewater systems, we find that there are unresolved uncertainties including potential inadequate protection of beneficial uses of waters of the State. By modifying the project's proposed Conditions of Approval as indicated, we feel that

> beneficial uses of waters of the State will be protected, such that it will not be necessary for the Regional Board to request of [*sic*] Report of Waste Discharge for the project (Wolfe 2002a).

Accordingly, the County modified the conditions of approval as recommended by the RWQCB staff. On March 19, 2002, the Board of Supervisors adopted an addendum to the Final EIR incorporating all of the above-cited letters/engineering reports submitted by FCE, the responses from Questa and the peer review. At the same March 19, 2002, hearing, the County took final action approving the CDP for the approved development. The County conditions for approval of the CDP incorporated the RWQCB staff's recommended modifications.

The County's action on the CDP for the approved development included the imposition of eleven conditions addressing both construction-related and post-construction polluted runoff control. These include Conditions 23, 25, 41, 46, 47, 51, 52, 56, 65, 74, and 75 (see below). The County's findings for approval of the CDP conclude that, as conditioned to prevent significant adverse impacts to water quality and sensitive habitat areas from polluted runoff, the approved development is consistent with the policies of the Marin County LCP, as follows:

> Mitigation Measure 4.5-4 [Condition 75] requires the project to utilize stormwater best management practices recommended by the San Francisco Bay Area Stormwater Management Agencies Association, or similar practices intended to minimize the effects of stormwater runoff (Marin County 2001, 4.2-18).
>
> Mitigation Measures 4.4-5, 4.4-6, and 4.5-5 [Conditions 73 and 56] would ensure proper treatment of wastewater and captured surface runoff to protect the water quality of water produced by NMWD wells (ibid, 4.2-22).
>
> Mitigation Measure 4.5-2 [Conditions 46 and 74] requires the project to include devices to capture and treat all projected runoff up to the 100-year, 24-hour storm event. Mitigation Measure 4.5-4 requires the use of construction best management practices to minimize erosion and sedimentation to protect offsite areas, including Lagunitas Creek (ibid, 4.4-23).
>
> The proposed project may be under construction through the 2002/2003 fall and winter season. As discussed in Section 4.5 (Hydrology and Water Quality) of this EIR, however, erosion and sediment control mitigation measures would reduce any potentially significant construction-related water quality impacts to a less-than-significant level. Specifically, Mitigation Measure 4.5-4 [Condition 75] requires the project to install erosion control and sedimentation control measures and slope stability measures before the beginning of the rainy season. This mitigation measure also requires sediment basins to be maintained through the development process to remove sediment from runoff waters. All sediment will be retained on site unless removed to an appropriate dumping location. Mitigation Measure 4.5-4 [Condition 75] also requires revegetation and topsoil stabilization consistent with this policy. Because Mitigation Measure 4.5-4 [Condition 75] would reduce construction-related water quality impacts to a less-than-significant level, the project would be consistent with this [LUP watershed and water quality protection/grading] policy. Because Mitigation Measure 4.5-4 [Condition 75] would reduce construction-related water quality impacts to a less-than-significant level, the project would be consistent with this [LUP watershed and water quality protection/grading] policy (ibid, 4.2-47).
>
> Impervious surfaces have been minimized to the maximum extent possible. As discussed in Section 4.5 (Hydrology and Water Quality) of this EIR, the proposed project includes an onsite stormwater collection and treatment system. Consistent with this [LUP watershed and water quality protection/grading] policy, the proposed system includes grassy swales rather than concrete storm drains, and infiltration trenches that facilitate groundwater recharge. The project,

therefore, would be consistent with this [LUP watershed and water quality protection/grading] policy (ibid).

No portion of the project would be located within Lagunitas Creek or its Stream Conservation Area. As discussed in Section 4.5 (Hydrology and Water Quality), Mitigation Measures 4.5-4, 4.5-8, and 4.5-9 [Conditions 75, 46, 74, and 73] would reduce all project-related water quality impacts to less-than-significant levels. As discussed in Section 4.13 (Biological Resources), these mitigation measures would reduce all project-related impacts to fish and wildlife supported by Lagunitas Creek to less-than-significant levels (ibid, 4.2-49).

As discussed in Section 4.5 (Hydrology and Water Quality) of this EIR, Mitigation Measure 4.5-2 [Conditions 46 and 74] would reduce offsite flood-related impacts to the maximum extent practicable by increasing the capacity of the proposed retention facilities to maintain or reduce peak off-site runoff rates from a 100-year, 24-hour storm event. This represents the largest design event (by volume) commonly used as an industry standard (ibid, 4.2-50).

As discussed in Section 4.5 (Hydrology and Water Quality), the project includes devices to capture and treat all projected runoff up to the 100-year, 24-hour storm event. Mitigation Measure 4.5-4 [Condition 75] requires the use of construction best management practices to minimize erosion and sedimentation to protect offsite areas, including Lagunitas Creek (ibid, 4.2-51).

4.2.3 Applicable Policies

The Marin County Unit II LUP New Development and Land Use Policy 6 provides:

6. Watershed and water quality protection/grading. In order to ensure the long-term preservation of water quality, protection of visual resources, and the prevention of hazards to life and prosperity, the following policies shall apply to all construction and development, including grading and major vegetation removal, which involve the movement of earth in excess of 150 cubic yards.

    a. Development shall be designed to fit a site's topography, soils, geology, hydrology, and any other existing condition and be oriented so that grading, cut and fill operations, and other site preparation are kept to an absolute minimum. Natural features, landforms, and native vegetation shall be preserved to the maximum extent feasible. Areas of a site which are not suited to development because of known soil, geologic, flood, erosion or other hazards shall be kept in open space.

    b. For necessary grading operations, the smallest practicable area of land shall be exposed at any one time during development and the length of exposure shall be kept to the shortest practicable time. The clearing of land shall be avoided during the winter rainy season and all measures for removing sediments and stabilizing slopes shall be in place before the beginning of the rainy season.

    c. Sediment basins (including debris basins, desilting basins, or silt traps) shall be installed on the project site in conjunction with national grading operations and maintained through the development process to remove sediment from runoff waters. All sediment shall be retained on site unless removed to an appropriate dumping location.

    d. Temporary vegetation, seeding, mulching, or other suitable stabilization methods shall be used to protect soils which have been exposed during grading or development. Cut and

fill slopes shall be stabilized immediately with plantings of native species, appropriate non-native plants, or with accepted landscaping practices.

e. Where topsoil is removed by grading operation, it shall be stockpiled for reuse and shall be protected from compacting and wind erosion during stockpiling.

f. The extent of impervious surfaces shall be minimized to the greatest degree possible. Provisions shall be made to conduct surface water to storm drains or suitable watercourses to prevent erosion. Drainage devices shall be designed to accommodate increased runoff resulting from modified soil and surface conditions as a result of development. Grassed waterways are preferred to concrete storm drains, where feasible for runoff conveyance. Water runoff beyond natural levels shall be retained on site whenever possible to facilitate groundwater recharge.

Marin County Zoning Code Section 22.56.130(C) requires the following:

Grading and excavation: The following standards shall apply to coastal projects which involve the grading and excavation of 150 cubic yards or more of material.

1) Development shall be designed to fit a site's topography and existing soil, geological, and hydrological conditions so that grading, cut and fill operations, and other site preparation are kept to an absolute minimum and natural landform are preserved. Development shall not be allowed on site, or areas of a site, which are not suited to development because of known soil, geology, flood, erosion or other hazards that exist to such a degree that corrective work, consistent with these polices (included but not limited to the protection of natural landform) is unable to eliminate hazards to the property endangered thereby.

2) For necessary grading operations, the smallest practicable area of land shall be exposed at any one time during development and the length of exposure shall be kept to the shortest practicable time. The clearing of land shall be avoided during the winter rainy season and all measures for removing sediments and stabilizing slopes shall be in place before the beginning of the rainy season.

3) In addition to such standards as may be imposed under MCC Chapter 23.08.090, the following standards shall be required:

   a) Sediment basins (including debris basins, desilting basins, or silt traps) shall be installed at the beginning of grading operations and maintained throughout the development process to remove sediment from runoff waters. Temporary vegetation, seeding, mulching, or other suitable stabilization methods shall be used to protect soils which have been exposed during grading or development. Cut and fill slopes shall be permanently stabilized as soon as possible with native plants or other suitable landscaping techniques.

   b) The extent of impervious surfaces shall be minimized to the greatest degree possible. Water runoff beyond natural levels shall be retained on-site whenever possible to facilitate maximum groundwater recharge. In order to prevent gullying the velocity of runoff on an off the site shall be dissipated through the application of appropriate drainage controls so that the runoff rate does not exceed the storm water runoff. Grassed or natural waterways are preferred to concrete storm drains for runoff conveyance.

c) Pollutants such as chemicals, fuels, and other harmful materials shall be collected and disposed of in an approved manner.

d) Where topsoil is removed by grading operations, it shall be stockpiled for subsequent re-use, where appropriate.

e) All debris shall be removed from the site upon the completion of the project.

f) Permit application for grading which involve cut slopes in excess of 8 feet or fill in excess of 5 feet shall include a reported from a registered soils or civil engineer.

The Unit II LUP Natural Resources Policies provide:

3. Streams and riparian habitats. The policies contained in this section shall apply to all streams in the Unit II coastal zone, perennial or intermittent, which are mapped by the United States Geological survey (U.S.G.S) on the 7.5 minute quadrangle series.

...

c. Stream Buffers. Buffers to protect streams from the impacts of adjacent uses shall be established for each stream in Unit II. The stream buffer shall be established for each stream in Unit II. The stream buffer shall include the area covered by riparian vegetation on both side of the stream and the area 50 feet landward from the edge of the riparian vegetation. In no case shall the stream buffer be less than 100 feet in width, on either side of the stream, as measured from the top of the stream banks. (no specific condition that addresses setback- however, the project is over 400 feet away)

d. Development in Stream Buffers. No Construction, alternation of land forms or vegetation removal shall be permitted within such riparian protection area. Additionally such project applications shall identify a stream buffer area which shall extend a minimum of 50 feet from the outer edge of riparian vegetation, but in no case less than 100 feet from the banks of a stream. Development shall not be located within this stream buffer areas. When a parcel is located within a stream buffer area; design review shall be required to identify and implement the mitigation measures necessary to protect water quality, riparian vegetation and the rate and volume of stream flows. The design process shall also address the impacts of erosion and runoff, and provide for restoration of disturbed areas by replacement landscaping with plant species naturally found on the site. Where a finding based upon factual evidence is made that development outside a riparian protection or stream buffer area would be more environmentally damaging to the riparian habitat than development within the riparian protection or stream buffer area, development of principal permitted uses may occur within such area subject to design review and appropriate mitigation measures. (no development proposed within 100 feet)

5. Other Environmentally Sensitive Habitats

...

(b) Other sensitive habitats include habits of rare or endangered species and unique plant communities. Development in such areas may only be permitted when it depends upon the resources of the habitat area. Development adjacent to such areas shall be set back a sufficient distance to minimize impacts on the habitat area. Public access to sensitive habitat areas, including the timing, intensity, and location of such access, shall be

controlled to minimize disturbance to wildlife. Fences, roads, and structures, which significantly inhibit wildlife movement, especially access to water shall be avoided.

Zoning Code Section 22.56.130 states in relevant part:

...

G. Stream and Wetland Resource Protection. The following standards shall apply to all development within or adjacent streams identified as blue-line streams on the most recent USGS 7 ½ minute quadrangle ma(s) for the project area.

...

3) For proposed projects located adjacent to streams, application submittals shall include the identification of existing riparian vegetation as a riparian protection area. No construction, alteration of land forms or vegetation removal shall be permitted within such riparian protection area. Additionally, such projects applications shall identify a stream buffer area which shall extend a minimum of 50 feet from the outer edge of the riparian vegetation, but in no case less than 100 feet from the banks of a stream. Development shall not be located within this stream buffer area. When a parcels is located within a stream buffer area; design review shall be required to identify and implement the mitigation measures necessary to protect water quality, riparian vegetation and the rate and volume of stream flows. The design process shall also address the impacts of erosion and runoff, and provide for restoration of disturbed areas by replacement landscaping with plant species naturally found on the site. Where a finding based upon factual evidence is made that development outside a riparian protection or stream buffer area would be more environmentally damaging to the riparian habitat than development within the riparian protection or stream buffer area, development of principal permitted uses may occur within such area subject to design review and appropriate mitigation measures.

...

I. Wildlife Habitat Protection

...

2) Siting of New Development. Coastal project permit applications shall be accompanied by detailed site plans indicating existing and proposed construction major vegetation, watercourses, natural features and other probable wildlife habitat areas. Development shall be sited to avoid such wildlife habitat areas and to provide buffers for such habitat areas. Construction activities shall be phased to reduce impacts during breeding and nesting periods. Development that significantly interferes with wildlife movement; particularly access to water, shall not be permitted.

In addition to the above-cited LUP and Zoning policies, Marin County LCP Amendment 1-MAJ-02 incorporates the County's conditions of approval as site-specific LCP implementation standards for the project site. Once certified by the Commission, these implementation measures, along with the existing provisions of the LCP, form the standard of review for any CDP for development of the site. Thus, the CDP for the approved development is conditioned to and must conform to the following provisions:

23. PRIOR TO RECORDATION OF THE FINAL MAPS FOR THE RESIDENTIAL OR VISITOR-SERVING USES, APPROVAL OF THE SUBDIVISION IMPROVEMENT

AGREEMENT, OR ISSUANCE OF A GRADING PERMIT, whichever occurs first, the following items shall be submitted to the Planning Division:

...

D. A letter from the Environmental Health Services Division which confirms that sufficient information has been provided by the project engineer to support the methodology and assumptions that form the bases for the design of the wastewater and stormwater systems and which confirms that the design would adequately address the following concerns: (1) adequacy of the design to adequately handle wastewater and stormwater runoff; (2) the adequacy of the hydrogeologic investigation to address concerns relating to viral contamination of Lagunitas Creek; (3) the potential for nitrate contamination of Lagunitas Creek; and (4) the adequacy of the site to accept post-development stormwater run-off. This letter should include written documentation of compliance with County regulations by the Environmental Health Services Division for on-site wastewater systems for all components and aspects of the designs. The compliance letter shall be submitted to the Regional Water Quality Control Board for review and approval by the Regional Board Executive Officer.

25. PRIOR TO APPROVAL OF THE SUBDIVISION IMPROVEMENT AGREEMENT OR ISSUANCE OF A GRADING PERMIT, whichever occurs first, the applicant shall submit plans for installation of all stormwater treatment and disposal improvements that are shown on Sheet C-1A of "Exhibit A." The applicant shall also demonstrate that an Operation, Maintenance, and Monitoring Plan for the stormwater systems, has been submitted and found acceptable by the Regional Board Executive Officer for the Regional Water Quality Control Board. This Plan should include identification of which entity will be responsible for maintaining the stormwater systems, and the means to assure that necessary funding to conduct operation, maintenance, and monitoring activities are in place.

41. PRIOR TO OCCUPANCY for the Williams Street Apartments, Papermill Creek Apartments, and Papermill Creek Homes, the applicant shall install all proposed and required landscaping. All soils disturbed by development of the project shall be reseeded with native grasses or wildflowers to control erosion. The applicant shall call for a Community Development Agency staff inspection of the landscaping and irrigation at least five working days before the anticipated completion of the project. Failure to pass inspection will result in withholding of the final inspections and imposition of hourly fees for subsequent reinspections.

46. PRIOR TO APPROVAL OF A SUBDIVISION IMPROVEMENT AGREEMENT OR ISSUANCE OF A GRADING PERMIT, whichever occurs first, the applicant shall comply with the following condition. To reduce offsite flood-related impacts to the maximum extent practicable, the capacity of the proposed retention facilities shall be sized such that the project results in no increase in post-development runoff volumes beyond existing runoff volumes from a 100-year, 24-hour storm event. This event represents the largest design event (by volume) commonly used as an industry standard. The following requirements shall be satisfied:

A. Installation and operation of the drainage system shall be such that the site drainage during construction shall result in no increase in post-development runoff volumes beyond existing runoff volumes from a 100-year, 24-hour storm event.

B. The drainage and infrastructure design capacity of the proposed retention and infiltration facilities shall accommodate any existing runoff from the West Marin School property.

C. The drainage and infrastructure design shall be sized to accommodate runoff from paved roads, and future development on the commercial parcel and the public parking parcel.

D. The applicant shall provide supporting hydrology and hydraulic calculations, references, model studies, reports, or other information necessary to confirm the project's drainage design.

47. PRIOR TO APPROVAL OF A SUBDIVISION IMPROVEMENT AGREEMENT OR ISSUANCE OF A GRADING PERMIT, whichever occurs first, the applicant shall comply with the following condition. The project shall have an erosion and sediment control plan which addresses both interim (during construction) and final (post construction) control measures. The specific control measures to be utilized shall be subject to the review and approval of the Department of Public Works and shall be in general accordance with the current "Manual of Standards for Erosion and Sediment Control Measures" published by the Association of Bay Area Governments. The plan shall be implemented by October 15t^{h} or earlier if so required by the Department of Public Works. The applicant shall demonstrate that a Notice of Intent to Comply with the statewide NPDES General Permit for Storm Water Discharges Associated with Construction Activity has been filed. The following requirements shall be met.

A. All disturbed surfaces including but not limited to cut and fill slopes, building pads, driveways and areas cleared of vegetation shall be protected against erosion by measures approved by the Department of Public Works that are appropriate to the site, phase of construction and time of year.

B. Grading operations shall not be conducted during the rainy season (October 15th through April 15th) without prior approval from the Department of Public Works. Such approval shall only be given upon clear demonstration, to the satisfaction of the Department of Public Works, that at no stage of the work will there be any substantial risk of increased sediment discharge from the site. When grading operations are permitted during the rainy season, a phasing plan and work schedule shall be required to insure that the smallest practicable area of erodible land is exposed at any one time and the time of exposure is minimized. The phasing plan and work schedule must be approved by the Department of Public Works prior to the start of grading or prior to October 1st at the discretion of the Department of Public Works. A cash bond in an amount approved by Department of Public Works may be required to insure that control measures are implemented and maintained.

51. PRIOR TO RECORDATION OF ANY FINAL MAP OR ISSUANCE OF A GRADING PERMIT, whichever occurs first, the applicant shall submit a conforming tentative map for review by the Department of Public Works and the Community Development Agency which indicates conformance with all conditions of project approval. The tentative map shall include the following:

A. Drainage facilities, including but not limited to, infiltration trenches, sedimentation basins, and conduits, serving multiple parcels shall have drainage and drainage access easements. Sufficient easements shall be required for underground conduits, infiltration trenches, for disposal of surface and storm waters, together with sufficient easements for overflow and ponding, and vehicle access necessary to provide for proper operation and maintenance of drainage facilities. All such easements shall comply with Marin County Title 24 and shall be of sufficient width for the purposes intended, as approved by the Public Works.

...

52. PRIOR TO RECORDATION OF EACH FINAL MAP, the applicant shall submit a maintenance agreement(s) which provides for the ability of the drainage and roadway improvements to be maintained by the associated parcels. The agreement shall be submitted to the Department of Public Works for review and approval and shall be recorded concurrently with the Final Map.

56. PRIOR TO FINAL INSPECTION OF THE SUBDIVISION IMPROVEMENTS OR GRADING PERMIT, whichever occurs first, the applicant shall conduct a flow verification test of the infiltration trenches, and the engineer shall certify to the Department of Public Works that the infiltration trenches were installed in substantial conformance to the plans and are operational.

65. The project shall comply with North Marin Water District's water conservation Regulation 17. This regulation includes requirements for low flow plumbing fixtures, installation of laundry facility washing machines that are Energy Star Rated and <u>restrictions on turf irrigation</u> [*emphasis added*].

74. PRIOR TO APPROVAL OF THE SUBDIVISION IMPROVEMENT AGREEMENT OR ISSUANCE OF A GRADING PERMIT, whichever occurs first, the applicant shall comply with the following condition. To reduce offsite flood-related impacts and to maintain the design capacity of the infiltration trenches to the maximum extent practicable, the following mitigation measures shall be implemented. (Hydrology, #4.5-2 and #4.5-14)

    A. To accommodate surface runoff from the West Marin School, the capacity of the proposed retention facilities shall be increased to accommodate any school runoff.

    B. To promote a long design life of the infiltration trenches, surface runoff shall be filtered prior to reaching the infiltration trenches to reduce contaminants and sediment that could clog the trench media. Filtering devices may include, but not be limited to, biofilter strips and vegetated channels. These features shall be subject to review and approval by Marin County prior to implementation.

    C. During construction, the following measures shall be taken to provide additional protection against the failure of the infiltration trenches:

        1. Adequate protection from siltation of the trench drains shall be provided during construction through the use of best management practices (BMP).

        2. Exposed soils shall be revegetated as soon as possible to prevent erosion.

        3. Excavated surfaces shall be scarified to promote percolation upslope of the trenches.

        4. The drain rock shall be washed prior to installation into the excavations.

        5. To prevent surrounding soils from migrating into the trenches, the excavation shall be lined with a permeable filter fabric or a similar filtering device.

        6. Inspection wells shall be constructed to allow monitoring of the performance of the trenches.

75. PRIOR TO APPROVAL OF THE SUBDIVISION IMPROVEMENT AGREMENT OR ISSUANCE OF A GRADING PERMIT, whichever occurs first, the applicant shall comply with the following condition. In accordance with Marin County Code Chapters 23.08 and 24.04, the project sponsor shall implement erosion and sedimentation Best Management Practices to protect the water quality of Lagunitas Creek and local groundwater. Best Management Practices (BMPs), designed to protect stormwater quality, are summarized in the California Storm Water Best Management Practice Handbooks (Stormwater Quality Task Force 1993) and can be recommended by the Association of Bay Area Governments Manual of Standards for Erosion and Sediment Control Measures. BMPs are subject to review and approval by Marin County Department of Public Works shall be implemented during project construction. According to Marin County Code Section 24.04.625, grading shall not be conducted during the rainy season (October 15 through April 15) without prior approval by Marin County Department of Public Works. (Hydrology, #4.5-4, #4.5-12, and #4.5-14)

    The following measures shall be implemented in accordance with the LCP:

    A. Sediment basins (including debris basins, desilting basins, or silt traps) shall be installed on the project site in conjunction with initial grading operations and maintained through the development process to remove sediment from runoff waters. All sediment shall be retained on site unless removed to an appropriate dumping location.

    B. Temporary vegetation, seeding, mulching, or other suitable stabilization methods shall be used to protect soils exposed during grading. Cut and fill slopes shall be stabilized immediately with approved landscape vegetation.

    C. All topsoil removed by grading operations shall be stockpiled for reuse onsite and shall be protected from compaction, wind, and erosion during stockpiling.

4.2.4 Substantial Issue Analysis

In consideration of whether the appellants' contentions concerning the impacts of polluted runoff resulting from the approved development raise a substantial issue of conformity with the Marin County LCP, the Commission is guided by the five factors described in Section 3.4 above. In this instance, the Commission finds that Factor 1, the degree of factual and legal support for the local government's decision that the development is consistent with the certified LCP, especially supports the determination that the appeal raises no substantial issue.

Through its review and final action on the approved development, the County considered the potentially significant adverse impacts to water quality and sensitive habitats related to polluted runoff. The County's approval of the CDP included eleven conditions to prevent significant adverse individual and cumulative impacts due to polluted runoff (Conditions 5, 23, 57, 58, 59, 60, 65, 70, 71, 72, and 73). In addition to imposing these conditions through its approval of the CDP, the County also adopted these conditions as site-specific LCP implementation measures. Once certified by the Commission, these implementation measures, along with the existing provisions of the LCP, form the standard of review for any CDP for development of the site. The County found that by imposing these conditions, which require construction and post-construction best management practices (BMPs), storm water system inspection, maintenance, and monitoring requirements, and modifications to the proposed storm water retention facilities sufficient to capture and treat 100% of the runoff of up to the 100-year, 24-hour storm event, the approved development would fully conform to the above-cited policies of the Marin County LCP.

The County's action is supported by a letter from the staff of the RWQCB (Wolfe 2002a). In this letter, the RWQCB staff recommended certain modifications to the County's conditions of approval to address potential water quality impacts to groundwater, wetlands, Lagunitas Creek, and Tomales Bay. The letter concludes:

> Based on our review of the proposed storm water and wastewater systems, we find that there are unresolved uncertainties including potential inadequate protection of beneficial uses of waters of the State. By modifying the project's proposed Conditions of Approval as indicated, we feel that beneficial uses of waters of the State will be protected, such that it will not be necessary for the Regional Board to request of [*sic*] Report of Waste Discharge for the project.

The County modified Conditions 25 and 47 in response to the RWQCB staff recommendations. Accordingly, Condition 25 requires the development to be undertaken in accordance with a Storm Water System Operation, Maintenance, and Monitoring Plan subject to the review and approval of the RWQCB Executive Officer. Condition 47 requires the applicant to file a Notice of Intent to Comply with the Statewide NPDES General Permit for Storm Water Discharge Associated with Construction Activity.

The County's action is also supported by the third engineering consultant that conducted a peer review of the appellants' and the applicant's engineering studies related to wastewater and polluted runoff impacts. The peer review confirmed the validity of the engineering analysis conducted by the applicant's consultant, Questa, stating in conclusion:

> Specifically, we find that our peer review of these documents do substantiate the findings and responses of Questa. Their responses are backed up with appropriate and substantiated data and are based on current State and County design parameters and standard of care engineering practices (PSOMAS 2002).

The Commission's Water Quality Unit has reviewed the technical studies concerning water quality impacts of the project and the engineering and design criteria for the project storm water treatment system, the conditions of approval as modified pursuant to the RWQCB recommendations, and the engineering reports submitted in support of the appeal. A detailed technical review of the relevant data along with the full text of the conditions of approval related to the design, inspection, maintenance and monitoring of the storm water treatment system is contained in Appendix C. A summary of this analysis is provided below.

Soil Storage Capacity

As discussed in Section 4.1.4 above, Questa has conducted a groundwater mounding analysis based on observed predevelopment seasonal high groundwater levels and a derived hydraulic conductivity. The study takes into account both rainwater and expected wastewater contributions to the subsurface environment. The result shows that adequate separations to groundwater will be provided with the approved leach field design. In addition, because the post-development rainwater loading to the subsurface is expected to remain similar to that prior to development, the mounding study also provides useful insights to the post-development hydraulic conditions and points to the site's subsurface capacity to absorb the combined loading of wastewater and storm water. The information in the local record, including the information provided by the applicant's consultant and confirmed by the County's third party peer review, support the County's findings concerning the site's subsurface water storage capacity. Furthermore, the post-development monitoring requirements imposed by the County through Condition 58 will further ensure compliance with the County's regulations and design criteria.

In accordance with this condition, contingency measures will be implemented in the event of noncompliance.

Cumulative Impacts of Storm Water Runoff and Erosion

The approved development as conditioned by the County is required to meet stringent erosion and polluted runoff control standards. The Conditions of approval meet or exceed the requirements of the LCP. For example, Condition 47 requires an erosion and sediment control plan addressing both construction and post-construction control measures consistent with the requirements of Unit II LUP Policy 6b and 6d. Pursuant to Condition 75, sediment basins (including debris basins, desilting basins, or silt traps) are required to be installed on the site in conjunction with initial grading operations and maintained throughout the construction period. All sediments must be retained on the site unless removed to an appropriate dumping location. These condition requirements parallel the requirements of the LCP related to polluted runoff and erosion control. In addition, Condition 46 exceeds the LCP requirements by requiring the storm water treatment system to be designed with sufficient capacity to capture and treat on site the 100-year, 24-hour design storm. This requirement ensures that runoff leaving the site will most likely not increase upon project completion. Any impacts downslope, including to Lagunitas Creek, associated with runoff will therefore be minimized and insignificant. In addition, to promote a long design life of the storm water infiltration trenches and prevent clogging, the County has required that surface runoff be filtered prior to reaching the trenches.

4.3 Conclusion – Polluted Runoff

The information reviewed by the Commission's Water Quality Unit supports the County's findings concerning polluted runoff. Consistent with the determination of the staff of the RWQCB and the County's third party peer review, the County's conditions of approval as modified are adequate to fully address any outstanding issues related to polluted runoff control and treatment.

In addition to requiring a full suite of construction and post-construction BMPs, Condition 46 requires capture and treatment on site of 100% of the runoff from a 100-year, 24-hour storm event. This standard substantially exceeds the storm water capture and treatment standard typically required for development projects in the Coastal Zone. The Commission finds that by requiring the project to meet this high standard for runoff capture and treatment, the County's action provides a high degree of certainty that the approved development will be undertaken in conformity with the water quality and habitat protection policies of the certified LCP.

The County's final action on the CDP application is conditioned to resolve all outstanding issues related to potential water quality impacts to the satisfaction of the staff of the RWQCB and the County's third party peer review. Therefore, the Commission finds that the degree of factual and legal support for the County's decision that the development is consistent with the certified LCP supports the determination that the appeal raises no substantial issue of conformity of the approved project with respect to the above-cited grounds concerning polluted runoff impacts.

5.0 APPEAL OF COMMISSIONERS DESSER AND REILLY

The local government action on the approved development included both the submittal of an amendment to the LCP to the Commission and approval of a CDP. The LCP amendment is a necessary precedent to the CDP because the approved development does not conform to the

site's pre-LCP amendment zoning. The zoning change is required because the approved development's clustered design does not conform to the minimum lot-size and setback standards of the pre-amendment zoning. Because the County's final action approving the CDP for the project precedes Commission certification of the related LCP amendment, the approved development was at the time of the final local action inconsistent with the certified LCP. It is on this basis that Commissioners Desser and Reilly appealed the CDP, contending:

> The approved development does not conform to the policies of the certified County of Marin Local Coastal Program (LCP) concerning allowable uses, minimum lot sizes, and setbacks.
>
> **Zoning**
>
> The action taken by the County of Marin approving Coastal Development Permit 2-MAR-00-134 for the subdivision of an 18.6-acre property into 13 parcels and the construction a 36-unit mixed-residential project is inconsistent with the existing zoning of the project site. The project site is partially zoned Coastal, Suburban Agricultural (C-RA: B-3) zoning which does not allow two-family dwelling units, requires a minimum lot size of 20,000 square feet per unit, and requires front, side, and rear setbacks of 30, 15, 10 feet respectively. The approved project includes two-family dwelling units that are not consistent with the setback and minimum 20,000 square-foot/unit parcel size requirements of the C-RA: B-3 zoning district.

Prior to its consideration of this appeal, the Commission certified Marin County LCP Amendment 1-MAJ-02 as submitted. As such, the above-cited zoning inconsistency is resolved and the approved development conforms to the currently effective certified LCP zoning designation for the project site. Therefore, the Commission finds that no substantial issue exists with respect to the grounds on which the appeal of Commissioners Desser and Reilly is filed.

Appendix A
References

FCE 2002a. Technical Review – Final Environmental Impact Report Point Reyes Affordable Housing Project. Fall Creek Engineering. January 28, 2002.

FCE 2002b. Rebuttal to Comments on Technical Review of Final EIR Point Reyes Affordable Housing Project. Fall Creek Engineering. February 10, 2002.

FCE 2002c. Supplemental Project Review – Point Reyes Affordable Housing Project. Fall Creek Engineering. March 18, 2002.

Marin County 2001. Final Environmental Impact Report for the Point Reyes Affordable Housing Project. EDAW, Inc. November 21, 2001.

Marin County 2002a. Findings for Project Approval and for Determination of Project Consistency with the Marin Countywide Plan, Point Reyes Station Community Plan, and Local Coastal Program Unit II. Marin County Board of Supervisors. March 19, 2002.

Marin County 2002b. Conditions of Approval, Point Reyes Affordable Homes, Inc. Countywide Plan Amendment, Community Plan Amendment, Local Coastal Plan Amendment, Local Coastal Permit, Master Plan, Precise Development Plan, and Subdivision. Marin County Board of Supervisors. March 19, 2002.

Marin County 2002c. Addendum to the Final Environmental Impact Report for the Point Reyes Affordable Housing Project. Marin County. March 18, 2002.

PSOMAS 2002. Peer Review of Fall Creek Engineering Comments and Questa Response. PSOMAS. March 14, 2002.

Questa 2002a. Point Reyes Affordable Housing Project – Response to Comment Letter from Fall Creek Engineering. Questa. February 4, 2002.

Questa 2002b. Point Reyes Affordable Housing Project – Response to Comment Letter from Fall Creek Engineering of February 10, 2002. Questa. March 5, 2002.

Questa 2002c. Point Reyes Affordable Housing Project – Response to Third Comment Letter from Fall Creek Engineering dated March 18, 2002. Questa. April 8, 2002.

Questa 2002d. DRAFT Monitoring and Contingency Plan for Point Reyes Affordable Housing Project Wastewater Facilities. Questa. April 8, 2002.

Wolfe 2002a. Request to Modify Conditions of Approval for the Point Reyes Affordable Homes Project, Point Reyes Station, Marin County. Bruce Wolfe, Watershed Management Division Chief, San Francisco Bay Regional Water Quality Control Board. March 18, 2002.

Wolfe 2002b. Point Reyes Affordable Homes Project, Point Reyes Station, Marin County – Regional Water Quality Control Board Recommendation for Marin County's Conditions of Approval. Bruce Wolfe, Watershed Management Division Chief, San Francisco Bay Regional Water Quality Control Board. April 24, 2002.

Appendix B
Marin County Sewage Disposal Regulations

County of Marin: Community Development Agency - EHS: Septic Systems Program - Section 800
Printed: April 25, 2002 05:01 PM

Section 800 - Alternative Systems

801 General Provisions

A. Alternative sewage disposal systems may be permitted by the Health Officer on individual lots where: (a) it is determined that sewage cannot be disposed of in a sanitary manner by a standard septic tank - drainfield system; or, (b) the health officer finds that an alternative system will protect the public health in a manner at least equal to that of the utilization of a standard system. Such alternative systems must comply with the specific requirements set forth in this section.

B. Alternative systems may be used to serve individual single family residences, multi-family residential structures, commercial establishments, and institutional and industrial facilities.

C. Alternative systems may be approved for use in County-established moratorium areas, Regional Water Quality Control Board (Regional Board) individual system prohibition areas, or areas affected by cease and desist orders which include prohibitions or limitations on new connections to a community sewer system. Such use may only be permitted with the approval of the Regional Board.

D. Types of alternative systems shall be categorized and their application shall be governed by the following:

1. **Category 1 - Repairs** This category includes all viable alternative systems that have technical merit, but not necessarily documented performance history. Alternative systems in this category may be used for system repair only.
2. **Category 2 - New Construction** This category includes alternative systems that have substantial documented performance history under conditions representative of the proposed application, and for which the County has adopted specific technical standards that are incorporated in this section. Alternative systems in this category may be used for new construction on any parcel legally created prior to the adoption of these Regulations as well as for repair of existing systems.
3. **Category 3 - Subdivisions** This category is restricted to alternative systems that have sufficient successful documented performance history and operating experience to allow them to be used for creation of new lots, and are so designated in this section. Category 3 alternative systems may also be used for repair of existing systems and for new construction on existing lots.

E. All alternative systems shall be installed by a licensed contractor.

F. Notwithstanding any other provisions of these Regulations, final approval of alternative system proposals shall be at the discretion of the Health Officer.

802 Construction Permit and Review Requirements

A. Engineering plans and site data for alternative systems shall be submitted in accordance with standard sewage disposal application procedures outlined in Section 100 of these Regulations.

B. Site evaluations, including soil profile inspection and percolation testing, shall be conducted in accordance with standard procedures outlined in Section 500 of these Regulations.

C. Engineering plans for alternative systems shall be signed by a Registered Civil Engineer or Registered Environmental Health Specialist who is knowledgeable and experienced in the field of on-site sewage disposal. The designer shall also be responsible for inspection of system installation to assure conformance with approved plans, and shall provide an "As-Built" drawing of the installation to the County and property owner. The construction inspection by the designer shall be in addition to standard County inspection work carried out in accordance with provisions of Section 703 of these Regulations.

D. In addition to site data and supporting engineering calculations, alternative system applications shall include:

1. Contingency plan which outlines specific actions to be taken to repair, expand or replace the system, should the need arise.

2. Construction inspection schedule which identifies critical points during construction at which time inspections will be made by the system designer.

3. Operation, maintenance and monitoring instruction which provide brief and simple guidelines to the system owner(s) regarding the operation of the system, his/her responsibilities and system monitoring needs.

4. Grant easement authorizing access by the Health Officer, Regional Water Quality Control Board personnel and agents for periodic inspection of system operation.

E. Engineering plans will be reviewed by the Health Officer and, as appropriate, Regional Board and external civil engineering consultant (s) selected by the Health Officer. At a minimum, the Regional Board will be notified of all proposals for the use of alternative systems for: (a) large systems (flows of 1,500 gpd, or more); (b) subdivisions; and, (c) cases where cumulative impacts are of special concern.

F. Permits issued for alternative systems will expire if building construction is not started within a period of one year. Applicants may submit a written request for an extension of this limit. Such a request may be granted in writing based on the judgment of the Health Officer that delay in construction is a result of weather conditions or other unavoidable circumstances.

G. Applications for an alternative systems shall be accompanied by application fees. The amount of the fees shall be established by the Board of Supervisors by ordinance and shall reflect the cost to the county of reviewing, approving and enforcing alternative system permits under these regulations. These regulations shall not be operative until fees are established.

803 Operating Permits

A. In addition to a construction permit, an operating permit is required for all alternative systems, with the exception of those installed solely for the repair of existing systems for single family residences. The Health Officer reserves the right to require an operating permit for repair systems where, in his/her judgement, such a permit is necessary to assure protection of water quality and public health. Also, an operating permit will be required for any repair utilizing a new alternative system which is not classified as a Category 2 or 3 system; these cases will require Regional Board review. The operating permit provisions outlined in this section also apply to any standard systems requiring operating permits, as determined by the Health Officer.

B. Operating permits shall be issued by the Health Officer at the time of initial construction of the system; and they are required to be renewed at least every two years or as otherwise specified by the Health Officer on a case-by-case basis. The Health Officer may reduce the renewal frequency to once every three or four years after successful performance is demonstrated; also, annual renewal may be required for certain types of systems or situations as deemed necessary by the Health Officer. Operating permits must also be renewed at the time of sale or, in the case of commercial properties, upon change of occupants.

C. Operating permits are intended to serve as the basis for verifying the adequacy of alternative system performance and maintenance. Permit conditions shall include monitoring and inspection requirements, permit duration, and other provisions deemed appropriate by the Health Officer.

D. Renewal of an operating permit requires the submission of an application, a fee, and the results of required system inspection and monitoring (per Section 804 below).

E. Failure to submit a renewal application, the required fee or specified monitoring and inspection data, or failure to undertake any required corrective work specified by the Health Officer may be cause for non-renewal or revocation of the operating permit by the Health Officer

F. Certified copies of operating permits and notices of withdrawal of operating permits, when issued, will be recorded in the office of the County Recorder of Marin County.

804 Performance Monitoring and Reporting

A. A monitoring program will be established individually for each alternative system at the time of issuance of the operating permit; it may be amended at the time of permit renewal. Said monitoring shall be performed to ensure that the alternative system is functioning satisfactorily to protect public health and safety. The specific requirements will incorporate recommendations of the system designer along with general monitoring criteria developed by the Health Officer.

B. Monitoring requirements will vary depending upon the specific type of alternative system; but, in general, they will include the following:

1. Recording of wastewater flow based on water meter readings, pump event counters, elapsed time meters or other approved methods;

2. Inspection and recording of water levels in monitoring wells in the disposal field;
3. Water quality testing of selected water samples taken from points in the treatment process, from monitoring wells, or from surface streams or drainage; typical water quality parameters to be analyzed for may include total and fecal coliform, nitrate, biochemical oxygen demand (BOD), and suspended solids;
4. Inspection and observation of pump operation or other mechanical equipment; and,
5. General inspection of treatment and disposal area for evidence of seepage, effluent surfacing, erosion or other indicators of system malfunction.

C. The required frequency of monitoring for each installation will generally be in accordance with the following schedule, assuming a record of suitable performance is established:

- Years 1 and 2 of operation - quarterly monitoring
- Years 3 and 4 of operation - semiannual monitoring
- Years 5 and beyond - annual monitoring

Monitoring frequency may be increased if system problems are experienced. Monitoring frequency for each system or type of system will be established be the Health Officer

D. Monitoring of alternative systems shall be conducted by or under the supervision of one of the following:

1. Registered Civil Engineer.

2. Registered Environmental Health Specialist.

The County shall conduct spot-check inspections of alternative systems on their own and may also be present to observe the performance of monitoring activities by others. The County will ordinarily inspect about 20 percent of the alternative systems in a given year. County inspections will be made as a quality control check and to assure County staff maintain personal familiarity with the operation of various types of alternative systems approved for use in the County. Additionally, the Health Officer reserves the right to require, on a case-by-case basis, "third party" or County inspection and monitoring of any alternative system where deemed necessary because of the complexity of the system or the sensitive nature of the site.

E. Monitoring results shall be submitted to the Health Officer annually, by July 1st, for the preceding 12-month period ending on May 31st. Monitoring results shall be reported on a standard form supplied by the Health Officer. The monitoring report shall be signed by the Registered Civil Engineer or Registered Environmental Health Specialist responsible for the monitoring. Notwithstanding the annual report, the County shall be notified immediately of any significant system problems observed during the inspection and monitoring or at any other time.

F. The Health Officer will compile all monitoring and inspection results annually and submit them to the San Francisco Regional Water Quality Control Board, along with appropriate summaries and discussion of special problems or issues. This report shall be prepared and submitted by October 1st of each year for the preceding June 1st - May 31st monitoring year results.

G. In evaluating the performance of alternative systems, the Health

Officer shall take into account such factors as

- effluent quality from treatment units;
- wastewater acceptance rates within treatment units (e.g., sand filter beds) and disposal fields (e.g., sand trenches and mound beds);
- effluent surfacing or near-surface soil saturation;
- groundwater mounding;
- groundwater quality effects beneath and downgrade of the disposal system (e.g., bacteriological, nitrate, other); and
- equipment malfunctions.

805 System Evaluation and Adoption of Standards

A. An annual performance review of alternative systems shall be made by the Health Officer. Technical evaluation of system performance shall be based primarily on monitoring results and shall consider the following:

1. Actual system usage in relation to design sewage flow;
2. Effluent level fluctuations in monitoring wells and evidence of seepage
3. Groundwater and surface water quality impacts
4. Influence of climatic conditions;
5. Operation of mechanical and electrical equipment; and,
6. Other pertinent findings.

B. The results of the Health Officer's annual evaluation of alternative systems may serve as the basis for adopting or modifying siting and design criteria for specific types of alternative systems. Recommendations may also be made by the Health Officer concerning permitting, review or monitoring requirements, or other issues as appropriate. Any changes in criteria or procedures shall be submitted to the Regional Board for their review and concurrence.

C. As sufficient experience and data are obtained, Category 2 systems will be reviewed to determine the appropriateness of elevating the particular system to Category 3. A minimum of two to four years of successful operation would normally be expected to be demonstrated prior to elevating alternative systems from Category 2 to Category 3. Determination and recommendations regarding reclassifying alternative systems will be made by the Health Officer based on direct field experience and considering input from:

1. San Francisco Bay Regional Water Quality Control Board.
2. Local engineering community.

3. Local contractors.
4. Users and other affected parties.
5. External technical consultants and manufacturers, as appropriate.
6. Experience from other jurisdictions.

Written approval from the Regional Board Executive Officer is needed for elevation of any given type of alternative system from Category 2 to Category 3.

D. Proposals to add new alternative systems to Category 2 will be received and reviewed annually by the Health Officer. The required procedures are as follows:

1. Proposals must be received by December 31st for consideration in the following calendar year.
2. Proposals shall be accompanied by a fee established by the County to cover County review and administrative costs.
3. Proposals shall set forth siting and design criteria in a format suitable for direct incorporation in these Regulations and consistent with that for existing alternative systems covered by these Regulations.
4. Proposals shall include supporting data and discussion of the rationale for the proposed alternative, and for all recommended siting and design standards.
5. Following internal review, the Health Officer will circulate the proposal for review by the local engineering community and will organize at least one workshop-meeting for discussion of the proposal
6. If, in the judgement of the Health Officer, and based on input from the local engineering community, the proposal merits further consideration, the Health Officer will submit the proposal to the San Francisco Bay Regional Water Quality Control Board (Regional Board) for review. The Health Officer will submit pending proposals to the Regional Board by July 1st of each year.
7. Siting and design standards for the alternative system will be incorporated into these Regulations following acceptance by the Health Officer and written approval from the Executive Officer of the Regional Water Quality Control Board.

806 Types of Alternative Systems Permitted

A. **Category 1 - Repairs.** Alternative systems permitted to be used for the repair of existing systems include systems listed in Categories 2 and 3 below and all other reasonably viable alternatives that have technical merit, but not necessarily documented performance history. For systems other than Category 2 and 3 alternatives, the system designer shall furnish engineering rationale, including appropriate references, to substantiate the design source and applicability of the proposed system. Proposals that include designs that cannot be substantiated by suitable reference materials or field performance results will be classified as experimental research proposals and, as such, will not be permitted under these Regulations. The Health

Officer reserves the right to establish special operating permit requirements for Category 1 systems as deemed necessary for protection of public health.

B. **Category 2 - New Construction.** Alternative systems permitted to be used for new construction on any existing lot of record include the following, plus systems listed under Category 3 below.

- Pressure-Dosed Sand Trenches
- Intermittent Sand Filters
- Steep Slope Mounds

Limits on the number of each type of Category 2 alternative system that may be permitted shall be established in a Memorandum of Understanding (M.O.U.) between the Health Officer and the Executive Officer of the San Francisco Bay Regional Water Quality Control Board. These limits may be adjusted from time-to-time upon mutual agreement between the Health Officer and the Executive Officer.

C. **Category 3 - Subdivisions** Alternative systems permitted to be used for the creation of new lots include the following:

- Standard Mounds

807 Cumulative Impact Assessment

A. **General Provisions** In addition to meeting established siting and design criteria, proposals to use alternative systems must, in accordance with Paragraph D of this Section, also provide an assessment of potential cumulative impacts that could result from the installation of the alternative system(s). Such cumulative impact assessment shall be conducted in accordance with the requirements outlined in this section. The results of the assessment shall be submitted for review by the Health Officer and may be grounds for denial or revision of the alternative system proposal, regardless of compliance with other siting and design criteria.

B. **Cumulative Impact Issues.** Where required, the primary issues to be addressed in cumulative impact assessments include the following:

1. **Groundwater Mounding** A rise in the water table, referred to as "groundwater mounding", may occur beneath or downgrade of sewage disposal systems as a result of the concentrated hydraulic loading from one or more systems in a given area.
2. **Groundwater Nitrate Loading** Discharges from on-site sewage disposal systems contain high concentrations of nitrogen that may contribute to rises in the nitrate level of local and regional aquifers.

For individual cases, the Health Officer may identify and require analysis of cumulative impact issues other than those listed above which, in his/her judgment could pose potential public health or safety risks.

C. **Qualifications** Cumulative impact assessments required for alternative system proposals shall be performed by or under the supervision of one of the following licensed professionals:

1. Registered Civil Engineer
2. Registered Geologist
3. Certified Engineering Geologist

4. Registered Environmental Health Specialist

Additionally, the licensed professional assuming responsibility for the cumulative impact assessment shall have training and experience in the fields of water quality and hydrology

D. **Cases Requiring Cumulative Impact Assessment** Cases where cumulative impact assessments shall be required are listed in Table 8-1, according to the type of installation, the type of alternative system and the type of cumulative impact issue of concern. Additionally, the Health Officer reserves the right to require the completion of a cumulative impact analysis in any case where, in his/her opinion, special circumstances related to the size, type, or location of the alternative system (or systems) warrant such analysis.

E. **Methods**

1. **Groundwater Mounding Analysis**

a. Analysis of groundwater mounding effects shall be conducted using accepted principals of groundwater hydraulics. The specific methodology shall be described and supported with accompanying literature references, as appropriate

b. Assumptions and data used for the groundwater mounding analysis shall be stated, along with supporting information. A map of the project siting showing the location and dimensions of the proposed system(s) and the location of other nearby septic systems, wells and relevant hydrogeologic features (e.g., site topography, streams, drainage channels, subsurface drains, etc.) shall be provided.

c. The wastewater flow used for groundwater mounding analyses shall be as follows:

1. For individual residential systems: 100 gpd/bedroom

2. For multifamily and other nonresidential systems: design sewage flow

d. Groundwater mounding analyses shall be used to predict the highest rise of the water table and shall account for background groundwater conditions during the wet weather season.

e. All relevant calculations necessary for reviewing the groundwater mounding analysis shall accompany the submittal.

f. Any measures proposed to mitigate or reduce the groundwater mounding effects shall be presented and described as to their documented effectiveness elsewhere, special maintenance or monitoring requirements or other relevant factors.

2. **Nitrate Loading**

a. Analysis of nitrate loading effects shall, at a minimum be based upon construction of an annual chemical-water mass balance. The specific methodology shall be described and

supported with accompany literature references as appropriate.

b. Assumptions and data for the mass balance analysis shall be stated, along with supporting information. Such supporting information should include, at a minimum:

(1)climatic data;
(2)groundwater occurrence, depth and flow direction(s);
(3)background groundwater quality data, if available;
(4)soils and runoff conditions;
(5)wastewater characteristics (i.e., flow and sewage strength); and,
(6)other significant nitrogen sources.

c. A map of the project siting showing the location and dimensions of the proposed system(s) and the location of other nearby septic systems, wells and relevant hydrogeologic features (e.g., site topography, streams, drainage channels, subsurface drains, etc.) shall be provided.

d. The wastewater flow used for nitrate loading analyses shall be as follows:

(1) For individual residential systems: 100 gpd/bedroom.

(2) For multifamily residential systems and other nonresidential systems: Average wastewater flow for the system; supporting data or other basis for the average flow determinations shall be provided.

e. Minimum values used for the total nitrogen concentration of septic tank effluent shall be as follows:

(1) Residential wastewater: 40 mg/l (for average flow conditions)

(2) Nonresidential wastewater: as determined from sampling of comparable system (s) or from literature values.

The Health Officer may require the use of more conservative values than cited above if, in his/her opinion, the values are not likely to be representative of the proposed systems(s).

f. All relevant calculations necessary for reviewing the nitrate loading analysis shall accompany the submittal.

g. Any measures proposed to mitigate or reduce the nitrate loading effects shall be presented and described as to their documented effectiveness elsewhere, special maintenance or monitoring requirements or other relevant factors.

F. **Evaluation Criteria**

1. **Groundwater Mounding.** The maximum acceptable rise of the water table for short periods of time during the wet weather season, as estimated from groundwater mounding analyses, shall be as follows:

a. **Mound Systems.**

1 **For Level Sites (0 - 2% Slope).** The seasonal water table shall not rise closer than 12 inches from the bottom of the sand fill for mounds having a sand fill depth of 12 inches. If the sand fill depth is 24 inches or the mound is preceded by an intermittent sand filter, the seasonal water table shall not rise closer than 6 inches from the bottom of the sand fill. Also, the Health Officer reserves the right to require, in individual cases, up to 24 inches of groundwater clearance where deemed necessary for protection of public health.

2 **For Sloping Sites (> 2% Slope).** The seasonal water table shall not rise closer than 12 inches to ground surface at the downslope toe of the mound.

b. **Pressure-Dosed Sand Trenches and Intermittent Sand Filters. Groundwater** mounding beneath the draining field shall not result in more than a 50-percent reduction in the minimum depth to seasonally high groundwater as specified in Tables PDST-1 and SF-1.

c. **Large Systems.** Notwithstanding **a** and **b** above, for all alternative systems with design flows of 1,500 gpd or more (i.e., "large systems"), the groundwater mounding analysis shall demonstrate that a minimum groundwater clearance of 24 inches will be maintained beneath the system.

1. **Nitrate Loading.** Criteria for evaluating the cumulative nitrate loading of alternative systems shall be as follows:

a. **For Areas Served by Water Wells.**

1 Alternative systems, on existing lots or subdivisions, shall not cause the groundwater nitrate-nitrogen concentration to exceed 7.5 mg/l (as N) at the nearest existing or potential point of groundwater withdrawal.

and

2 The total loading of nitrate from new subdivisions shall not result in an average groundwater nitrate-nitrogen concentration, over the geographical extent of the subdivision, that exceeds 7.5 mg/l (as N).

b. **For Areas Not Served By Water Wells**

1 Alternative systems, on existing lots or subdivisions, shall not cause the groundwater nitrate-nitrogen concentration to exceed 10.0 mg/l (as N) at the nearest existing or potential point of groundwater withdrawal.

and

2 The total loading of nitrate from new subdivisions shall not result in an average groundwater nitrate-nitrogen concentration, over the geographical extent of the subdivision, that exceeds 10 mg/l (as

N).

808 Siting and Design Criteria

Siting and design criteria for Category 2 and Category 3 alternative systems are set forth in Appendix A.

County of Marin: Community Development Agency - EHS: Design, Construction & Repair
Printed: April 25, 2002 05:01 PM

Regulations for Design, Construction and Repair of Individual Sewage Disposal System

100	Permit Application and Procedures
200	Definitions
300	General Provisions
400	Site Suitability Criteria
500	Site Evaluation Requirements
600	Design Criteria
700	Installation and Inspection
800	Alternative Systems
900	Waiver of Regulations
Fig. 1	Typical Septic Tank Details
Fig. 2	Wastewater Loading Criteria
Fig. 3	Typical Drainfield Trench Details
Fig. 4	Serial Distribution Details
Fig. 5	Elevated Cover Fill Details
Fig. 6	Effluent Pump and Sump Details
Fig. 7	Typical Intercept Trench Details
Fig. 8	Typical Mound System Details (end view)
Fig. 9	Typical Inspection Well

Pursuant to Marin County Code Chapter 18.06

100 **Permit Application and Procedures**

101 Application for an Individual Sewage Disposal Permit shall be made on a form supplied by the Health Officer accompanied by the appropriate fee.

102 All information required on the form must be supplied or the application will be deemed incomplete and returned to the applicant

103 Three copies of a detailed Plot Plan shall accompany each application for a permit, drawn to scale of not less than 1 inch equals 20 feet. Plans shall be a minimum of 8 1/2" x 11" in size and not greater than 24" x 36" in size. Plans shall contain the following:

A. Location map indicating location of parcel with respect to community and nearest public road.

B. Parcel boundary and dimensions.

C. Owner's name and address of dwelling or structure, Assessor's Parcel Number, north arrow and plan scale.

D. Location of all wells (both on site and in general vicinity), springs, watercourses and water bodies, marsh areas, drainage ditches, channels, cuts, embankments, natural bluffs or unstable land forms on the property or within 100 feet of any portion of the proposed system or reserve area.

E. Location of existing and/or proposed structures, swimming pools, retaining walls, driveways, paved areas, water lines, underground utilities and easements on the site and within 25 feet of the proposed system off site.

F. Contours, and/or spot elevations, except that parcels where the average slope is 5% or less may indicate only the direction and percentage of slope. The direction and percentage of slope of the drainfield area shall be shown for all plans.

G. Location of any existing sewage disposal system(s) on the property.

H. Layout (including dimensions) of proposed system.

I. Typical trench section and any other essential construction details, such as pumps, intercept drains, etc.

J. Location of individual soil percolation test holes and soil profile holes.

K. Name and signature of Registered Civil Engineer or Registered Sanitarian responsible for design.

104 Soil percolation test results, soil profile logs and/or results of soil textural analysis shall accompany each application, on forms supplied or approved by the Health Officer.

105 Each application shall be accompanied by the calculations used to determine sizing of the septic tank and absorption area and any other special design features.

106 Acceptance of an application for a permit as complete does not guarantee that a permit will be issued. Issuance of a permit does not ensure that a system will operate satisfactorily.

107 Upon issuance of a septic system permit and building permit (if requested) work may commence on construction of the approved system. The septic tank and drainfield/absorption area may not be covered until a final inspection is performed by the Health Officer. A minimum of 24 hour advance notice is required to arrange for final inspections by the Health Officer.

108 A copy of the building plans, including the approved sewage disposal system, shall be available at the job site during the system installation and until the system is approved by the Health Officer

200 DEFINITIONS

201 Absorption Area: The effective absorption area shall include only the two sidewall areas below the bottom of the drainfield pipe.

202 Alternative System: Any individual system that does not include a standard septic tank for treatment, or does not include standard leaching trenches for effluent disposal, which has been demonstrated to function in such a manner as to protect water quality and preclude health hazards and nuisance conditions.

203 Bedrock: Solid rock, which may have fractures, that lies beneath soils and other unconsolidated material. Bedrock may be exposed at the surface or have an overburden up to several hundred feet thick.

204 Bedroom: Any room designated by applicant as a "bedroom"; other rooms, such as sewing rooms, dens, offices, studios, lofts, game rooms, etc., may also be considered as bedrooms. Rooms having one or more of the following features may not be considered by the Health Officer to constitute a bedroom:

A. A large, arched doorway without a door which opens onto the entryway or a main activity area.

B. Use of a half wall or railing along at least one side of the room.

C. A conversation pit which interrupts the floor area.

Notwithstanding the above provisions, the minimum number of bedrooms for any dwelling shall be no less than the following:

Gross Floor Area	No. of Bedrooms
0-1400 S.F.	1
1401-1900 S.F.	2
1901-2800 S.F.	3
over 2800 S.F.	4

205 Building: A structure including decks and steps, whether covered or uncovered, breezeways, covered patios, carports and similar structures.

206 Clay: As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

207 Cut or Embankment: Any altered area of land surface having a distinctly greater slope than the adjacent natural ground surface, over 24 inches in vertical height, and any part of which is lower in elevation than the ground surface at the nearest point of the individual sewage disposal system. Cuts supported by retaining walls or similar structures shall be included within this definition.

208 Dosing Tanks: Tanks which collect treated sewage for a period of time and then, periodically, discharge it into an absorption area by means of an automatic siphon so that the effluent distribution is equal throughout the entire leaching area.

209 Downslope Property Line: A property line of the subject property where the ground on the adjacent property slopes downward from that property line.

210 Drainfield: System of rock-filled trenches or bed(s) that distribute treated sewage effluent for absorption into the soil (also "Leachfield", "Soil Absorption System").

211 Dual Drainfield: An effluent disposal system consisting of two complete standard drainfields connected by an accessible diversion valve and intended for alternating use on an annual or semiannual basis.

212 Effective Drainfield Depth: The depth of drain rock below the bottom of the drainfield pipe.

213 Ephemeral Watercourse: A seasonal stream that flows for an extended period during and following a rainfall period. Ephemeral streams are dry for a significant portion of the year.

214 Groundwater: Any subsurface body of water which is beneficially used or is usable. It includes perched water if such water is used or usable, or is hydraulically continuous with used or usable water.

215 Hardpan: A hardened or cemented soil horizon or layer. The soil material may be sandy or clayey and may be cemented by iron oxide, silica, calcium carbonate, or other substances.

216 Health Officer: The Marin county Health Officer or his/her authorized representatives.

217 Impermeable layer: A soil or geologic formation which may contain water but is incapable of transmitting significant quantities. For example, clay, hardpan and solid bedrock belong in this category.

218 Intermittent Watercourse: Any observable watercourse that flows only in direct response to precipitation. It receives no water from springs and no long-continued supply from melting snow or other surface source.

219 Leachfield: See Drainfield

220 Mottling, Soil: Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage.

221 Mound: An individual sewage disposal system that utilizes a permeable fill material and by dispersion or uniform application of wastewater makes more effective use of absorption capabilities in areas containing high groundwater levels or soils of limited permeability or depth. A mound contains the following parts; (1) the mound body fill material; (2) the distribution bed; (3) the distribution manifold and laterals; and (4) the topsoil cover.

222 Perched Water: A subsurface body of water separated from the main groundwater body by a relatively impermeable stratum above the main groundwater body.

223 Percolation Test: The percolation test procedure authorized by these regulations.

224 Perennial Watercourse: Any stretch of a stream that can be expected to flow continuously or seasonally. Perennial watercourses are generally fed in part by springs.

225 Public Entity: Shall mean a local agency, as defined in the State of California Government Code, Section 53090, et seq., which is empowered to plan, design, finance, construct, operate, maintain, and to abandon, if necessary, any sewage system or the expansion of any sewage system and sewage treatment facilities serving a land development. In addition, the entity shall be empowered to provide permits and to have supervision over the location, design, financing, construction, operation, and maintenance of any facilities necessary for the disposal of waste pumped from individual sewage disposal systems and to conduct any monitoring or surveillance programs required for water quality control purposes (unless there is an existing public entity performing these tasks).

226 Sand: Individual rock or mineral fragments in soils having diameters ranging from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

227 Saturated Soil: The condition of soil when all available pore space is occupied by water and soil is unable to accept additional moisture. In very fine textured soils a free water surface may not be apparent.

228 Seepage Bed: A type of absorption system which uses a very wide trench partially filled with gravel or crushed stone. Piping distributes the treated sewage evenly throughout the entire bed so that it may seep into the earth. The seepage bed is covered with soil to prevent sewage from reaching the ground surface. (Also Absorption Bed.)

229 Septic Tank: A watertight, covered receptacle designed and constructed to receive the discharge of sewage from a building sewer, separate solids from the liquid, digest organic matter and store digested solids through a period of detention, and allow the clarified liquids to discharge for final disposal.

230 Serial Distribution: An arrangement of an absorption area in which the lines are connected consecutively to receive the flow of sewage one after another. It is most useful for hill-side locations.

231 Setback: The minimum horizontal distance from any point along the outside edge of a septic tank or the edge of a drainfield trench, mound, etc., to any point on the described site feature.

232 Silt: Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

233 Soil: The unconsolidated material on the surface of the earth that exhibits properties and characteristics that are a product of the combined factors of parent material, climate, living organisms, topography, and time.

234 Soil Absorption System: See Drainfield.

235 Soil Depth: The combined thickness of adjacent soil layers that are suitable

for effluent filtration. Soil depth is measured vertically to bedrock, hardpan, or an impermeable soil layer.

236 Spoil Horizon or Layer: A layer of soil differing from adjacent (underlying or overlying) layers in some property or characteristic. Differences include, but are not limited to, color, texture, pH, structure, and porosity.

237 Soil Texture: The relative proportions of sand, silt, and clay as defined by the classes of the soil textural triangle (U.S. Department of Agriculture). The basic textural classes in order of increasing proportion of fine particles are sand, loamy sand, sandy loam, loam, silt loan, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay and clay. Textural classes may be modified when coarse fragments are present in sufficient number, i.e., gravelly sandy loam, cobbly clay, etc.

238 Unstable Landform: An area which shows evidence of mass downslope movement such as debris flow, landslides, rockfills, and hummocky hillslopes with undrained depressions upslope. Unstable landforms may exhibit slip surfaces roughly parallel to the hillside; landslide scars and curving debris ridges; fences, trees, and telephone poles which appear tilted; or three trunks which bend uniformly as they enter the ground. Active pond dunes are unstable land forms.

239 Watercourse: A definite open channel with bed and banks within which water flows either perennially, ephemerally or intermittently including overflow channels contiguous to the main channel. A watercourse shall include both natural and man-made channels.

300 GENERAL PROVISIONS

301 New Systems on Newly Created Lots: Individual sewage disposal systems serving new improvements on lots created subsequent to the approval of these regulations, revisions or amendments thereto.

302 New Systems on Existing Lots: Individual sewage disposal systems serving new improvements on lots created prior to approval of these regulations, revisions or amendments thereto shall comply in all respects to the current regulations. The Health Officer may consider variances from these regulations as provided herein.

303 Modification to Existing Systems: Where an existing sewage disposal system is proposed to be expanded, replace or relocated because of proposed major changes to an existing structure served by an individual sewage disposal system, such as addition of bedrooms for a residence or changes in use or expansion of a nonresidential structure, the following criteria shall apply:

A. If the property currently is within 400 feet of a public sewer main and it is physically and legally possible to connect to such main as determined by the Health Officer, no expansion of the existing sewage disposal system will be allowed and connection to a public sewer will be required.

B. If the property does not meet the above criteria requiring connection to a public sewer, the sewage disposal system may be enlarged or relocated in accordance with these regulations to accommodate the increase in sewage effluent. If it is determined by the Health Officer that the existing drainfield is not functioning properly, it shall also be repaired or replaced as required by the Health Officer. In the event said system does not utilize a septic tank which satisfies current regulations, a new septic tank complying with these regulations, shall be installed.

C. If the existing system's design included a specified reserve area, then this reserve area shall to be used in any way that would, preclude its intended use unless a substitute area is provided or it can be clearly demonstrated that the system was built or can be modified so as to not require a reserve area.

304 Repair of Existing Systems: Where it is necessary to repair or make modifications to an existing system, every effort shall be made to comply with the current regulations. If repair of the system is required by the Health Officer and the property currently is within 400 feet of a public sewer main and it is physically and legally possible to connect to such main as

determined by the Health Officer, then connection to a public sewer main shall be required. If it is found to be impractical or impossible as determined by the Health Officer to repair the system using a standard drainfield as described in these regulations and connection to a sewer main is not possible, the Health Officer may consider an alternative design.

305 Land Divisions and Subdivisions: Every tentative map for which individual sewage disposal systems are proposed shall include sufficient information to demonstrate conformance with these regulation and compliance with Marin County Code Section 20.24.060 (c). This shall include:

A. Soil profiles and percolation tests as specified in Section 501 and 502.

B. Schematic layouts including drainfield location and building envelop to verify that a drainfield of sufficient size can be installed to accommodate the potential sewage loading from the proposed lot without need of a variance from these regulations. For proposed residential lots, the design shall be based on a 3 bedroom residence.

306 Location of Systems: An individual sewage disposal system serving a building or buildings shall be located on the same building site, lot or parcel as the building(s). Where an existing parcel is found to be unsuitable to accommodate an individual sewage disposal system, the system may be located on another lot or parcel within a norevocable easement specifically designated for such sewage disposal system.

307 Common Systems: Common individual systems serving more than one lot or parcel, regardless of ownership, shall be prohibited unless operated and maintained under the authority of a public entity.

400 SITE SUITABILITY CRITERIA

401 Setbacks

Minimum horizontal distances between the septic tank and drainfield system and various physical site features shall be as follows:

Site Feature	Setback to Septic Tank	Setback to Edge of Drainfield
Building	5 feet	10 feet
Adjoining Property Line (1)	5 feet	5 feet
Downslope Property Line (1)	10 feet	25 (5)
Wells (domestic or non-domestic)	100 feet	100 feet
Perennial Watercourse (2)	50 feet	100 feet
Ephemeral Watercourse (2) or Seasonal Wetland	50 feet	75 feet
Intermittent Watercourse (2)	50 feet	50 feet
Natural Lake or Water Supply Reservoir (3)	100 feet	200 feet
Ocean, Bay or Tidal Estuary (4)	50 feet	100 feet
Edge of Drainfield Pipe	5 feet	
Cut, Embankment or Natural Bluff	10 feet	4h (6)
Unstable Land Form	50 feet	50 feet
Swimming Pool	10 feet	25 feet
Domestic Water Line	10 feet	10 feet

Driveway or Paved Surface	5 feet	5 feet

(1) Where the property line extends into a public roadway easement the setback shall be measured from the near edge of the easement

(2) Distances shall be measured from the top edge of the bank.

(3) Distances shall be measured from the high-water line.

(4) Distances shall be measured from the mean higher-high-water line.

(5) Setback distance shall be 50 feet if the property line is one where there is a reasonable chance that a cut bank could be excavated for house or road construction.

(6) Distance in feet equals four times the vertical height of the cut, embankment or bluff or 50 feet, whichever is less, but in no case less than 25 feet or more than 100 feet. Distances shall be measured from the top edge of the cut, embankment or bluff. Where an impermeable layer intersects a cut, and natural seepage is evident, the setback shall be 100 feet from the cut, unless it can be demonstrated that other site factors (e.g., soil depth) adequately protects against lateral seepage of untreated effluent.

402 Depth to Groundwater

Minimum depth to the anticipated highest seasonal level of groundwater below the bottom of the drainfield trench shall be as follows:

Percolation Rate (Min/inch)		Soil Texture (% Silt + Clay) [1]	Minimum Depth to Seasonally High Groundwater (ft.)
Slower than 5	or	More than 15	2
1 to 5	and	10 to 15	10
1 to 5	and	less than 10	20
Faster than 1			system prohibited

1. Soil of this texture or finer must exist for a minimum of three (3) continuous feet between the bottom of the drainfield trench and the water table.

2. A minimum of 2 feet may be granted only as a variance of for certain alternative systems.

403 Ground Slope

A. The ground slope in the drainfield area shall not exceed 20% without special engineering design.

B. Where the proposed drainfield site exceeds 20%, a geological engineering report shall be required. The report, prepared by a registered civil engineer or certified engineering geologist, shall demonstrate that the use of a soil absorption system will not create a public health hazard or otherwise jeopardize the proposed building site or contiguous properties.

C. For slope greater than 40%, special design techniques (e.g., pressure distribution) shall be r equipped; conventional leaching trench designs shall not be permitted.

404 Soil Depth

A. Minimum depth of soil below the bottom of the drainfield trench shall be three (3) feet.

B. Soil depth is measured vertically to the point where bedrock, fractured or solid, hardpan or an impermeable soil layer is encountered.

C. Soil depth and suitability shall be determined in accordance with inspection procedures outlined in section 500.

405 Percolation Rate

A. The percolation rate of soils in the disposal area, including reserve area, shall not be slower than 1 inch per 120 minutes (120 MPI).

B. Where percolation rates are faster than 1 inch per 5 minutes (5 MPI), then additional groundwater separation distances may be required as outlined in Subsection 402.

C. Percolation rates shall be determined in accordance with testing procedures outlined in Section 503.

500 SITE EVALUATION REQUIREMENTS

501 General

A. Site evaluations shall be performed on all lots for which sewage disposal improvements are proposed in order to determine compliance with the site suitability criteria specified in Section 400, and as a basis for system design.

B. Site Evaluations shall be performed by or under the supervision of one of the following:

1. Registered Civil Engineer
2. Registered Geologist
3. Certified Engineering Geologist
4. Registered Sanitarian
5. Certified Professional Soil Scientist

C. Site inspections shall also be conducted by the Health Officer to verify compliance with any or all of the provisions of these regulations.

502 Soil Profile Inspection

A. Soil conditions shall be evaluated by direct inspection of the soil profile, using backhoe excavations, hand-augering or core sampling.

B. If a backhoe is used, a minimum of one (1) excavation in each of the primary and reserve areas shall be required. If an auger or coring device is used, a minimum of two (2) borings in each of the primary and reserve area shall be required.

C. For land divisions and subdivisions, a minimum of one (1) backhoe excavation or two (2) augured test borings (or corings) shall be required for each of the first four (4) lots. For projects having over four (4) lots, and where the Health Officer finds the lots are generally uniform in configuration, terrain and soil characteristics, a fewer number of soil profiles may be allowed. In all cases, a sufficient number of soil profile excavations shall be made to identify suitable drainfield locations and reserve areas on each proposed parcel.

D. The soil profile shall be inspected to a depth of at least three (3) feet below the bottom of the proposed disposal system. The following observations shall be made and recorded:

1. Thickness, depth and texture of soil layers encountered.
2. Depth to bedrock, hardpan or other impermeable layer.
3. Depth to groundwater.
4. Evidence of soil mottling.
5. Other conditions affecting the potential use of the soil for sewage disposal, including, but not limited to, evidence of roots, fissures, dampness, structure and stoniness.

503 Percolation Testing

A. Percolation tests are to be carried out (in soils in their native state) at the proposed depth of the soil absorption field and at lesser depths as may be required by soil changes. Percolation tests may be conducted at the bottom of backhoe or other excavation holes where deeper testing is required by the Health Officer. Additional percolation testing or textural analysis of deeper soil zones may be required by the Health Officer to determine if underlying soils have adequate permeability.

B. Individual tests are to be run in 6" to 12" diameter holes dug or bored using hand tools. If power based tools are used remove any smeared soil surfaces from the sides of the hole.

C. Remove loose material from the bottom of the hole and add 2 inches of coarse sand or fine gravel to protect the bottom from scouring.

D. If soils tend to collapse, place a perforated pipe in the hole and carefully pack gravel around it between the pipe and the hole wall. Where gravel pack is needed, the percolation rate shall be adjusted for the water displacement attributable to the gravel and perforated pipe. The adjustment factor shall be computed based upon determination of the actual percentage of void space in the gravel pack of the test hole.

E. Presoaking is required in all tests. The water shall be carefully placed within the hole. Water must be added to at least 12" depth over the gravel and maintained at this level for at least 4 hours and preferably overnight. If the soil is known to have a low shrink-swell potential (clay content 15% or less) testing may proceed (Section F) after the 4 hour presoak.
Soils with higher shrink-swell potential are to be tested the following day but within 24 hours of presoaking as follows.

F. Fill the hole with clean water (no chemical additives) approximately 6" above the gravel (or 8" above the bottom of the hole). with a float gauge or secure fixed reference and time piece determine the time for the water to recede one inch or determine the drop of water after an interval of 30 to 60 minutes. Refill and repeat the process, over a 2-hour to 4-hour period, until subsequent tests indicate a stabilized rate has been obtained (i.e., two consecutive rates are within about 10% of each other). The last water level drop is used to calculate the percolation rate. Time lapse between test intervals should be minimal (5-10 minutes). Test results should be reported in units of minutes per inch.

G. At least six percolation tests shall be made in separate test holes spaced over the proposed drain field area. At least three of the test holes shall be at the bottom depth of the proposed drainfield. The others may be placed at intermediate depths. The average of the six tests shall be used for determining the appropriate loading rate from the table in Section 603B.

H. For land divisions a minimum of three (3) percolation test holes shall be required for each of the first four (4) lots. For projects having over four (4) lots, and where the Health Officer finds the lots are generally uniform in soil characteristics, a fewer number of percolation tests may be allowed. In all cases, a sufficient number of tests shall be made to identify suitable drainfield locations on each proposed parcel.

504 Wet Weather Testing

A. Wet weather determination of groundwater levels shall be required except in areas determined by the Health Officer to have adequate documentation of groundwater conditions.

B. Wet weather percolation testing may be required in areas determined by the Health Officer to have (1) clayey soils (greater than 30% clay) with high shrink-swell potential or (2) potential soil saturation problems. Textural analysis of soils may be required by the Health Officer to make case-by-case determinations of needs for wet weather testing.

C. The wet weather testing period shall be determined annually by the Health Officer on the basis of rainfall occurrence in different areas of the County as follows:

Beginning: On January 1st or after one-half (1/2) of the seasonal normal precipitation has fallen, which ever occurs sooner.

Ending: On April 15th, or later in the event of unusually heavy spring rainfall

600 DESIGN CRITERIA

601 Sewage Flows

A. Single and Multiple Family Dwellings. For design purposes, minimum sewage flows from residential buildings shall be calculated based on 150 gallons per day per bedroom.

B. Other Buildings: Sewage flows for commercial establishments and other non-residential buildings shall be estimated in accordance with the quantities listed in table 1. Other sewage flow estimates may be considered by the Health Officer if supported by adequate technical documentation.

C. Water Saving Devises: Reductions in design sewage flows may be granted where certain water saving devices are incorporated permanently into the buildings being served.

1. Reductions of up to 30% may be granted where either 2-quart air drive or 3-liter pressure flush toilets are installed in all bathrooms.
2. Flow reductions for other water saving devices may be considered by the Health Officer on a case-by-case basis or in general as water conservation technology develops.
3. All installations incorporating water saving devices shall require design and final inspection by a registered civil engineer, and recordation of water use restrictions on the property deed.

TABLE 1
Quantities of Sewage Flow

Type of Establishment	Gallons per Person per day SIZE="-2" (unless otherwise noted)
Small dwelling and cottage with seasonal occupancy	100+
Hotels without private baths	50
Hotels with private baths (2 persons per room)	60
Restaurants (toilet and kitchen waste per patron)	10
Restaurants (kitchen wastes per meal served)	5
Additional for bars and cocktail lounges	2
Tourist camps or trailer parks with central bathhouse	75
Tourist courts or mobile home parks with individual bath units	100
Resort camps (night and day) with limited plumbing	50
Work or construction camps (semi-permanent)	50
Day camps (no meals served)	15
Day schools without cafeterias, gymnasiums or showers	15
Day schools with cafeterias, but no gymnasiums or showers	20
Day schools with cafeterias, gyms, and showers	25

Boarding schools	100
Day workers at schools and offices (per shift)	15
Hospitals (per bed space)	250+
Institutions other than hospitals (per bed space)	125
Factories (gallons per person per shift, exclusive of industrial wastes)	35
Picnic parks (toilet wastes only), (gallons per picnicker)	5
Picnic parks with bathhouses, showers, and flush toilets	10
Swimming pools and bathhouses	10
Country clubs (per resident member)	100
Country clubs (per non-resident member present)	25
Motels (per bed space)	40
Motels with bath, toilet, and kitchen wastes	75
Drive-in theaters (per car space)	5
Movie theaters (per auditorium seat)	5
Airports (per passenger)	5
Self-service laundries (gallons per wash, i.e., per customer)	50
Stores (per toilet room)	400
Service Stations (per vehicle served)	10

602 Septic Tank Design

A. Size. The required minimum septic tank size shall be as follows:.

1. For single family dwellings:

Number of Bedrooms	Minimum Tank Capacity, Gallons
4 or less	1200
5 or more	1500 plus 250 for each bedroom over 5

2. For other building, the capacity shall be at least two times the daily sewage flow and, in no case, less than 1200 gallons.

B. Compartments: The septic tanks shall be of two compartment construction. The first compartment shall be twice the capacity of the second and separated by a baffle. The arrangement of tank features shall be as shown in Figure 1 , unless otherwise approved by the Health Officer.

C. Placement. Septic tanks should be installed so that manhole opening (s) are within twelve (12) inches of ground surface.

D. Construction Materials. The tank shall be watertight and shall be constructed of reinforced concrete, standard weight reinforced concrete block, fiberglass or other durable, non-corrodible synthetic materials approved by the Health Officer. Metal or wooden tanks shall not be permitted.

E. Structural Strength. The tank shall be capable of withstanding anticipated structural loads. The tank top must be capable of

supporting and earth load of not less than 300 pounds per square foot when maximum coverage does not exceed three (3) feet. The minimum compressive strength of any concrete tank wall, top and covers, or floor shall be twenty-five hundred (2500) pounds per square inch.

F. Bedding. The tank shall be installed level on a solid bed. Soil around the tank shall be hard-compacted or jetted.

G. Access Risers. A riser shall extend from each manhole cover to the surface of the ground to allow access for inspection and maintenance of the tank. The riser shall be of a size sufficient for removal of the manhole cover and shall be constructed of durable materials. Septic tanks in areas to be surfaced by concrete, asphalt or similar paving shall have access riser(s) brought to grade.

H. Building Connections. All connections from buildings to septic tank shall be made in accordance with the most recent edition of the Uniform Plumbing Code which is incorporated by reference into the County's Building Ordinances.

I. Variances. Septic tanks which deviate from the above design criteria may be approved by the Health Officer if such deviation is found to be reasonably necessary in a particular case and will not result in a less effective tank. In any such case the Health Officer may require the applicant to submit plans and specifications of such tank prepared by a licensed civil engineer.

603 Standard Drainfield Design

A. Dual Drainfields: Dual drainfields, each containing 100% of the required absorption area, shall be required. The dual drainfields shall be connected to the septic tank by an approved diversion valve which allows alternating use of each drainfield. The top of the diversion valve shall be at or above ground surface or placed in an access box with its cover at or above ground surface to allow easy access.

B. Sizing/Absorption Area: Drainfields shall be sized according to the minimum absorption area calculated from the following table and Figure 2 on the basis of observed percolation rates.

Percolation Rate (min/in)	.Maximum Sewage Loading Rate (gal/ft.2/day)*
Less than 1	System prohibited
3	1.2
10	0.8
24	0.6
30	0.56
45	0.45
60	0.35
90 - 120	0.2
Greater than 120	System Prohibited

*effective infiltrative surface is the trench sidewall area below the invert of the drainpipe

C. Trench Dimensions. See Figure 3 for (typical Cross-section)

1. Depth. Minimum effective trench depth shall be 12 inches. maximum trench depth shall be 8 feet.
2. Width. Minimum trench width shall be 8 inches; maximum trench width shall be 36 inches.

3. Spacing. Minimum spacing between trench walls shall be calculated as twice the effective trench depth plus an additional foot for each 5% drainfield area slope over 20%. In no case shall the trench spacing (center-to-center) be less than 6 feet.
4. Length. The required length of drainfield trench shall be determined in accordance with the loading - absorption area requirement cited in Sub-section 603 B. No single trench shall be more than 100 feet in length.
5. Pipe Slope. The drainfield pipe shall be laid level, with a maximum gradient of 3 inches in 100 feet.
6. Cover. Minimum dimension from ground surface to the top of the drain rock shall be as follows:

Drainfield Slope	Cover Required
0-10%	12 inches
10-15%	24 inches
Over 20%	30 inches

D. Configuration. Drainfield trenches shall be arranged to achieve serial distribution as indicated in Figure 4.

E. Materials.

1. Solid and perforated drainfield pipe shall be 3-inch or 4-inch (inside diameter) rigid plastic (PVC, ABS, or equivalent) with a minimum crushing strength of 1,500 psi, clearly marked on the pipe. corrugated pipe is not permitted.
2. Drain rock shall be clean, durable 3/4 inch to 1 1/2 inch crushed rock or gravel.
3. Silt barriers shall consist of untreated building paper, three inches of straw, filter fabric, or other material approved by the Health Officer.

F. Reserve Area.

1. A reserve area may be required as a condition of a variance from other elements of these regulations.
2. Reserve areas shall meet all site suitability requirements outlined in these regulations and shall not be used for construction of buildings or roadways or for other incompatible or soil-damaging activities.

604 Standard Drainfield Design

A. Fill System. Where soil and/or groundwater conditions require shallow trench placement, soil fill may be used to satisfy drainfield cover requirements. Typical cross-section details are shown in Figure 5. Such fill systems shall comply with all site suitability and design criteria for standard systems as well as the following requirements

1. Ground Slope. Maximum allowable groundslope shall be 12 1/2%.
2. Percolation Rate. Percolation rate shall not be slower than 60 min./inch.
3. Drainfield Trenches. The drain rock and perforated pipe sections shall be installed entirely within native soil. Systems in which effluent is proposed to be discharge into fill shall be considered under the Alternative Design Category - See Section 800.

4. Site Preparation. Prior to placement of fill material, all vegetation shall be removed and the ground surface disced or plowed to permit good mixing of native soil and fill material
5. Fill Material. The soil used for fill shall be similar in texture to the native soil. Sand, gravel or rock do not qualify as acceptable material for cover fill. The fill shall be placed prior to excavation of drainfield trenches.
6. Compaction. Fill shall be placed in layers of not more than eight (8) inches, and compacted to approximately the same dry density as the native soil. Results of soil density tests may be required to be submitted to the Health Officer. Alternative compaction procedures may be allowed in accordance with recommendations and supporting technical data supplied by a registered civil engineer.
7. Coverage. The fill shall be continuous and constructed to a uniform depth of at least 12 inches over all drainfield trenches. The fill shall extend a minimum distance of 15 feet in any direction from the center of any trench. The toe of the fill should be tapered at not less than 5:1 ratio, beginning 15 feet from any drainfield trench.
8. Land and Subdivisions. Land divisions for which fill systems are necessary for approval of sewage disposal suitability shall be required to record a declaration of restrictions approved as to form by the County Counsel.

B. Effluent Pump. Where topography will not allow gravity to flow from the septic tank to the drainfield, the individual sewage disposal system shall include an effluent pump and sump. Typical pump and sump details are shown in Figure 6.

1. Pump: The pump shall be of the size and type to accommodate the intended use and shall include the following:
   a. A "Hand-off-auto" (HOA) switch.
   b. An audio and visible alarm and necessary sump water sensing device to indicate a "high water" condition.
   c. Either a "pill" or mercury float switches for starting and stopping.
   d. A minimum pumping volume of 100 gallons between the pump's start and stop levels.
   e. The pump to be set a minimum of 4 inches above the sump bottom.
2. Sump:
   a. The sump shall have an overall working capacity (below the inlet from the septic tank) of about 1 1/2 times the design daily sewage flow. This capacity shall include the the normal operating does volume plus 24 hour emergency storage capacity for periods of pump failure or power outage.
   b. In lieu of 24 hour emergency storage capacity, an automatic bypass to a separate storage tank or emergency leaching area may be provided.
   c. The sump shall be either concrete, concrete block or fiberglass.
   d. Access shall be provided by a minimum 20-inch manhole.
   e. All pipes and/or electrical conduits through the sump shall be either precast into the sump or sealed with gas-tight compression connectors.
3. Electrical Features: The following electrical features shall be

provided:

a. An outdoor-type control box containing fused disconnect and motor protection switch.

b. The control box shall be mounted on the building served if located within 20 feet of the sump, otherwise the control box shall be mounted on a pipe stand or wooden post.

c. Electrical conduit shall be PVC. Separate conduits shall be provided for control wire and power supply.

d. A high water audio and visible alarm shall be located within the building served by the sewage disposal system.

4. Pressure Piping:

a. The pipe from the sump to the drainfield shall be solid plastic, schedule 40, and sized to meet pumping and effluent flow requirements while minimizing frictional losses.

b. A union, swing check valve and double wedge gate valve mounted in this order (away from the pump) is required either in the sump or adjacent to the sump in a concrete box.

c. Concrete thrust blocks shall be required at sharp changes in piping direction.

5. Permits: Aside from an individual sewage disposal system permit, additional permit(s) will be required by the Building Inspection Department for pump installations.

C. Drainage Improvements. Surface and sub-surface drainage waters shall be diverted from the drainfield area.

1. Surface Flows. Any concentrated drainage flow from buildings, yards, drives, etc., shall be diverted away from the drainfield area. This may require site grading and installation of a diversion ditch or berm on the upslope side of the drainfield area.

2. Sub-surface Flows. The use of intercept drains to lower the level of perched groundwater in the immediate drainfield area shall be acceptable under the following conditions:

1. Natural ground slope is greater than 5%.

2. Site investigations show groundwater to be perched on a clearly definable layer of bedrock, hardpan or impermeable soil.

3. The intercept drain shall be installed on the upslope side of the drainfield area as follows: (see Figure 7for typical construction details).

a. The intercept drain shall be a minimum of 12 inches wide and shall extend from ground surface into bedrock, hardpan or the impermeable soil layer a minimum of six (6) inches.

b. Pervious sections of the intercept drain shall be separated from the drainfield and septic tank as follows:

upslope:	minimum of 15 feet
laterally:	minimum of 25 feet
downslope:	minimum 50 feet

c. The bottom and downslope side of the drain shall be lined with plastic film having a minimum thickness of 12 mils.

d. The drainage trench shall be filled with 3/4 to 1 1/2 inch drain rock, with perforated 4" drainpipe along and 2" above the bottom of the trench

e. Filter fabric, straw, graded aggregate or other suitable filter material shall be placed immediately above the drain rock.

f. The trench shall be backfilled to the surface with 6 to 12 inches of soil.

g. A constant, minimum fall of at least 1% and gravity flow shall be maintained throughout the drain toward the outlet point.

h. The downslope outlet shall be protected against blockage or damage through the use of screening, rock cover, junction box or other suitable means.

i. A surface drainage diversion ditch shall be installed upslope of the intercept drain.

4. Engineering plans shall be provided to demonstrate compliance with the above provisions. Where the potential effectiveness of the intercept drain is not clear, the Health Officer may require such drain to be installed and demonstrated effective prior to issuance of an individual Sewage Disposal System.

700 INSTALLATION AND INSPECTION

701 General:

1. Sewage disposal systems shall be installed in accordance with plans approved by the Health Officer except for minor deviations. Changes in sewage disposal plans must be approved by the Health Officer prior to installation.
2. All systems shall be constructed by licensed contractors except that systems for single-family residences may be installed by the property owner.

702 Septic Tanks:

1. Septic tanks shall be installed level on a firm bedding of compacted soil, sand or rock.
2. In areas of high groundwater, septic tanks shall be demonstrated to be water-tight, including field testing, if necessary.

703 Drainfields:

1. Trenches should be constructed when the soil is dry to minimize unnecessary soil compaction and smearing of trench sidewalls.
2. Smearing of the infiltrative surfaces (trench bottom and sidewalls) during construction shall be corrected by scarifying the infiltrative surfaces after excavation is complete.
3. Surface runoff shall be prevented from entering open trenches during construction to minimize siltation of the trench bottom area.
4. Backfill shall be placed so as to maximize surface runoff and not crush drain lines.

5. Erosion protection in the drainfield area shall be required upon completion of installation.

704 Inspections:

1. All installations shall be inspected by the Health Officer before they may be considered complete.
2. The Health Officer shall be notified at least twenty-four (24) hours prior to installation of the system to allow inspection of trenches, septic tank and related features.
3. Sewage disposal systems requiring pump installations or other electrical features shall be inspected by the County Building Inspector.
4. In addition to items 1, 2 and 3 above, alternative systems shall require inspection, testing and certification by the engineer of record. Such inspection work shall be conducted in accordance with recommended procedures proposed by the engineer and approved by the Health Officer. (see Section 800 Alternative Systems.)

800 ALTERNATIVE SYSTEMS (see separate package)

900 WAIVER OF REGULATIONS

901 General:

Waiver of any of the regulations contained herein may be granted by the Health Officer when, because of special circumstances applicable to the location, soil characteristics, or surroundings, the strict application of these regulations would derive such property of privileges enjoyed by other property in the vicinity, provided, however, that no waiver shall be granted if reduction of requirements would present a threat to water quality or public health.

902 Application:

Applications for waiver(s) shall be made in writing on a form prescribed by the Health Officer, and shall be accompanied by appropriate technical information or report(s) supporting the waiver request.

903 Review and Determination:

Upon receipt of the application and supporting information, the Health Officer shall review the request and conduct an investigation to determine whether a waiver should be granted under the provisions of Section 901 above. The Regional Water Quality Control Board shall be notified of the waiver application and the Health Officer's investigation. After conclusion of the investigation, the Health Officer shall prepare a written order granting or denying the waiver, and shall include in such written order specific findings of fact and reasons for its granting or denial.

904 Nonconforming Lots

This section shall not be construed to allow the creation of new substandard or nonconforming lots or parcels, except with the explicit approval of the Board of Supervisors, and upon a showing of good cause and finding that such variance will not be injurious to the public health.

905 Geographical Area Waivers:

From time to time, the Health Officer may consider the issuance of waivers to specific provisions of these regulations for general geographical areas of the county. Such geographical area wavers may be considered in response to applications(s) by individuals or solely upon the initiative of the Health Officer. Adequate technical justification must be presented in support of such waivers, and will be subject to review and concurrence by the San Francisco Bay Regional Water Quality Control Board. Geographical area waivers adopted as proved here will be incorporated into these regulations.

906 Stinson Beach Area:

Stinson Beach is formally established as an on-site wastewater management area. Standards for sewage disposal at Stinson Beach are set forth in the "Wastewater management Program; Rules and Regulations", adopted by the Stinson Beach Waste Quality District, which are incorporated here by reference.

Figure 1 Typical Septic Tank Details
Figure 2 - Wastewater Loading Criteria
Figure 3 - Typical Drainfield Trench Details
Figure 4 - Serial Distribution Details
Figure 5 - Elevated Cover Fill Details
Figure 6 - Effluent Pump and Sump Details
Figure 7 - Typical Intercept Trench Details
Percolation Test Data Sheet

Appendix C
Water Quality Unit Analysis

This is a summary of comments, sorted by the four main issue areas, raised by the project appellants in letters from their consultant, Fall Creek Engineering, Inc. (FCE), and the corresponding responses from the project applicant's consultant, Questa Civil, Environmental & Water Resources (Questa). PSOMAS is the third party peer reviewer of the exchanged documents. Coastal Commission staff's analyses follow the comments and responses, at the end of each issue. The dates shown indicate the dates of the letters.

Issue #1: Onsite Disposal of Wastewater and Stormwater Runoff

Appellants' Consultant, FCE (1/28/2002)

- The FEIR and supplemental information do not provide a thorough hydrologic analysis of existing and future conditions at the site to determine if the additional wastewater and stormwater will be contained on-site. The drainage calculations should account for seasonal hydrologic changes, not just the short-duration design storm of 100-year, 24-hour design storm. A groundwater mounding analysis should be conducted.

Applicant's Consultant, Questa (2/4/2002)

- The wastewater disposal systems and stormwater infiltration facilities will be located in areas on-site with the lowest seasonal groundwater levels. FCE's assertion that they are located at areas with the highest seasonal groundwater levels is incorrect. The highest seasonal groundwater conditions occur in the upper portions of the property, including areas identified as seasonal wetlands.
- A groundwater mounding analysis has already been done with results showing adequate separation to groundwater will be provided by the proposed leachfield designs.
- A minimum 50-foot setback is proposed between leaching trenches and stormwater infiltration trenches to avoid potential soil saturation impacts.
- No stormwater trenches are located downslope of any of the three larger wastewater disposal systems. These are the systems with the greatest potential to cause localized groundwater mounding.
- FCE estimated the total amount of wastewater plus stormwater infiltration that will be generated by the project over the course of an entire year, and compared this to the available water holding capacity of the unsaturated zone at a single instant during the wet weather season. This is unrealistic because wastewater and stormwater generation is spread out over a period of time and the groundwater system is always in a state of flux with water entering and leaving the system at all times.

Appellants' Consultant, FCE (2/10/2002)

- The groundwater mounding study presented in the feasibility study deals only with the wastewater but not the stormwater.
- There may be interaction between the wastewater and stormwater despite the 50 feet separation between the two kinds of infiltration trenches.

- FCE used the specific percolation test results from the various areas in the lower east side to arrive at a hydraulic conductivity of 7.2 ft/day, not 20 ft/day as claimed by Questa. (FCE used percolation rates from a variety of depths.)

Applicant's Consultant, Questa (3/5/2002)

- Percolation test values from deeper than 48 inches provide the most representative values for the groundwater mounding analysis because the purpose is to evaluate the potential rise in the water table in the soil zones below the leaching trenches. The percolations test data show increasing permeability in the deeper soils in the proposed leachfield areas. FCE used percolation rates from shallower soil zones.
- USDA's Marin County soil survey indicates that the prevalent soil onsite, the Cortina, increases its permeability with depth. The estimated permeability at the 44 to 60 inch depth ranges from 12 to 40 ft/day. Also, these are vertical permeability figures; horizontal permeability is commonly faster by a factor of two or more.
- Rainwater infiltration into the soils in the areas upslope of the leachfields will decline because of construction of access road, driveways and walkways. The runoff from these areas will be collected and dispersed into the ground on the lower side of the site, 50 feet downslope of the leachfields.
- Infiltrated stormwater will not raise the groundwater levels under the leachfields because (a) the leachfields will be located 50 feet upslope of the infiltration trenches, (b) the leaching trenches will be 2 to 4 feet higher than the infiltration trenches, and (c) there will be no net increase in the amount of rain water/stormwater added to the subsurface environment in the leachfield area.
- Groundwater mounding analysis for the larger systems is required as part of the normal design review process when permit applications are submitted to Marin County Environmental Health Services.

Appellants' Consultant, FCE (3/18/2002)

- Data used to determine the depth to groundwater at the proposed leachfield locations were gathered from wells drilled into the bedrock with bentonite and cement seal from the groundwater surface to at least 11 feet deep. The groundwater level thus measured cannot truly represent the water table above the confining layer.
- It is technically invalid for Questa to directly convert percolation rates into hydraulic conductivities. Instead, FCE provides two regression equations for the two parameters. Results using these two equations show that at least four septic systems will become flooded and the lower leachfield for the Papermill Creek Apartments would fail during periods of high groundwater.

Applicant's Consultant, Questa (4/8/2002)

- Wet weather groundwater levels were observed not only from the permanent wells but also from numerous backhoe test pits. These test pits were dug in April 1998 and March 2000. April 1998 was at the end of the El Nino winter. March 2000 followed a very wet February when 140% of normal precipitation fell. The more conservative of these data were used in calculating groundwater mounding to provide the necessary safety cushion. Leachfield widths and/or trench depths were modified to

accommodate some of the shallower groundwater depths observed in March 2000. (See the 4/5/2000 Addendum)

- The two hydraulic conductivity/percolation rate equations provided by FCE are invalid because (1) they contradict one another (K increases with P in one while decrease with P in the other), (2) the results yielded by the two equations are an order of magnitude different (the equations obviously are site-specific and cannot be applied to the subject site), (3) there is no universal percolation test procedure and that the ones employed in arriving at the equations weren't specified (Questa followed the Marin County's percolation test procedure), and (4) it's not clear whether the hydraulic conductivity provided by the two equations represents vertical or horizontal K. Depending on the soil structure, horizontal K, which is used in the groundwater mounding analysis, is generally greater than the vertical rate by a factor of 2 to 20 times.

Third Party Peer Reviewer, PSOMAS

- PSOMAS concluded, after having reviewed all correspondence up to March 5, 2002, that "our peer review of these documents do substantiate the findings and responses of Questa. Their responses are backed up with appropriate and substantiated data and are based on current State and County design parameters and standard of care engineering practices."

CCC

- The information in the local record provided by Questa supports the County's determination that the highest seasonal groundwater conditions do not occur underneath the proposed leachfields. The higher groundwater levels tend to occur in the upper portions of the project site. In regard to the alleged inappropriateness of relying on groundwater levels observed in the monitoring wells because these wells were potentially measuring levels of the confined aquifer, the information provided in the local record by Questa and confirmed by the County's third party peer review demonstrates that the observed levels in the wells had been confirmed with additional water levels obtained from numerous backhoe test pits. In addition, inappropriate numbers had already been removed from the analyses. Therefore, the observed levels are deemed representative of seasonal high groundwater levels.
- It was reasonable for the County to rely on Questa's drainage calculations using the 100-year, 24-hour storm because such calculations represent a conservative (safe) approach to evaluate the ground's ability to absorb a sudden increase in water input during and immediately after larger-than-normal storms. The 100-year, 24-hour design storm already represents rain events much higher in volume than past stormwater best management practice (BMP) design requirements imposed by the Commission and others, and certainly higher in volume than the average rainfall events as well. Compliance with this requirement would entail compliance with the more widely accepted 85th percentile, 24-hour design storm requirement. In comparison, FCE's water budget (infiltrated rainwater plus wastewater) analysis comparing the estimated annual flow input with the unsaturated zone's water holding capacity at a single instant does not take into account the fact that real life groundwater regime is a dynamic system that allows flows into and out of the system

continuously. It is neither necessary nor appropriate to expect a water holding capacity large enough to hold the system's one entire year's worth of inflow, with the assumption of zero outflow.

- The information supports the County's decision to reject FCE's contention that Questa's groundwater mounding study takes into account only the wastewater but not the stormwater contribution to the groundwater system. Rainwater contribution in the groundwater mounding analysis had already been incorporated into the numbers used for the parameter, Available Unsaturated Soil Depth Below Trench. This parameter represents the space between the trench bottom and the groundwater level. The numbers were derived by observing the seasonal high groundwater levels, which, under predevelopment conditions, were largely due to rainwater infiltration. High seasonal groundwater levels were observed at the end of the last El Nino winter in April 1998 and then in March 2000, following a February with 140% of normal precipitation. The predicted groundwater rise, based on wastewater flow, in the mounding analysis is subtracted from the available unsaturated soil depth to arrive at a predicted net separation to groundwater. This figure is then compared with the required separation to determine if a system complies with the County's septic code. It should be noted that the total post-development rainwater/stormwater contribution to the site's subsurface is not expected to vary significantly from the pre-development conditions due to the 100-year, 24-hour design storm used for stormwater BMPs.
- Staff agrees with the applicant's consultant's determination that percolation test values from deeper than 48 inches would provide the most representative values for groundwater mounding analysis because mounding in this case is expected to occur from bottom up. Nevertheless, it would have been more appropriate for Questa to derive location-specific hydraulic conductivities for the leachfields. Instead, Questa chose 20 ft/day as the hydraulic conductivity, a general number corroborated by USDA's data. Even if one only examines percolation rates from tests performed at 48 inches and deeper, one would still be able to find quite a range of percolation rates. For example, at 48 inches, percolation rates from test pits 80 and 81 are 23.4 and 20.7 MPI, respectively. These translate into 5.1 and 5.8 ft/day, respectively. These figures are much lower than the assumed K of 20 ft/day. This illustrates the fallacy in assuming one single K for the entire site. Different and more location-specific Ks would have been more appropriate.

  Notwithstanding the use of one single K, in general, there does seem to be a pattern of higher permeability with soil depth. Accordingly, the 20 ft/day used by the County in approving the project is reasonable. And, the groundwater mounding study conducted by the applicant's consultant does indicate adequate separations to groundwater for the leachfields. An added level of confidence is provided because the post-development monitoring program to be implemented will assess and verify compliance with the County's required separation to groundwater as well as the validity of the mounding analysis conducted. This monitoring program will include monitoring wells installed both upgradient and downgradient of the leachfields, and <u>within</u> the leachfields as well.

  The project proponent has also agreed, as part of the required contingency plan, to reanalyze potential groundwater mounding for the leachfields in the event that some of the wastewater flows are to be redirected to fields with predicted excess capacities.

It would then be appropriate to perform these analyses using location-specific hydraulic conductivities from the appropriate depth.

- Questa's assumption that runoff upslope of leachfields is collected and infiltrated 50 feet below the leachfields is only true for certain areas. Particularly, on the west side of the site, a significant portion of the runoff is to be infiltrated using grass swales and infiltration trenches upslope of the proposed areas for the public restroom and Williams Apartments' leachfields. Nevertheless, stormwater infiltration upslope does not change the groundwater mounding conditions underneath the leachfields because the overall rainwater available in the subsurface of the leachfield areas will likely remain similar under both pre- and post-development scenarios. Questa's groundwater mounding analysis accounting for both existing rainwater and projected wastewater contributions thus supports the County's determination that mounding is not an issue, assuming the hydraulic conductivity used mimics real life conditions.

Issue #2: Hydrogeologic Investigation

Appellants' Consultant, FCE (1/28/2002)

- In determining the Zone of Contribution to the NMWD wells, Questa only considered pre-project conditions.
- The estimated pre-project groundwater travel time to Lagunitas Creek and the NMWD wells are 1 and 2.5 years, respectively. These times are too fast and may pose a significant threat (nitrate and virus) to groundwater quality at those locations.

Applicant's Consultant, Questa (2/4/2002)

- The study to determine the Zone of Contribution for the NMWD wells was based on: (a) the areal geology as determined from lithology revealed through the drilling of the eight monitoring wells plus the NMWD wells; (b) groundwater levels, contours, and gradients as determined from nine different monitoring points and multiple observations over a 10-month period; (c) water quality sampling data; and (d) groundwater travel times determined from aquifer hydraulic properties and groundwater contours.
- The Zone of Contribution is not likely to alter too much or extend far into the project area in the future because: (1) the bedrock surface on-site affecting flow directions will still be there; and (2) the current cone of depression for the NMWD wells is oriented along the axis of Lagunitas Creek. Any future expansion of the cone due to increased pumping will likely extend along the creek alluvium, rather than laterally in the direction of the project site.
- The California Department of Health Services defines a Microbial/Direct Chemical Contamination Zone as "the surface area overlying the portion of the aquifer that contributes to the well within a two-year time-of-travel." The two-year time-of-travel criterion is used because existing research indicates that bacteria and viruses survive less than two years in soil and groundwater.

Appellants' Consultant, FCE (2/10/2002)

- The estimated groundwater travel time between the site and Lagunitas Creek is one year, which is short enough for some viruses to survive the trip. This is especially

worrisome if the viruses surface in the wetlands short of the creek and get swept in by surface water.

- Dr. Armstrong of FCE concedes that "[c]onsidering the topography and geology of the area" the water from the project site will not be captured by the NMWD wells under any circumstance.

Applicant's Consultant, Questa (3/5/2002)

- It's highly unlikely to expect viruses to arrive at Lagunitas Creek. Viral contamination consideration has been built into the existing stream/water well setback criterion for leachfields. Marin County and most of the US require a 100 feet horizontal setback from streams to protect against, among other things, lateral migration of pathogens into the water bodies. The proposed leachfield systems are located approximately 500 feet from Lagunitas Creek.

Applicant's Consultant, Questa (4/8/2002)

- The Chief Hydrogeologist with the California Department of Water Resources, Carl Hauge, has concurred with the design and execution of the hydrogeologic investigation to study travel time of groundwater to NMWD wells.

Third Party Peer Reviewer, PSOMAS

- PSOMAS concluded, after having reviewed all correspondence up to March 5, 2002, that "our peer review of these documents do substantiate the findings and responses of Questa. Their responses are backed up with appropriate and substantiated data and are based on current State and County design parameters and standard of care engineering practices."

CCC

- The information in the local record supports the County's determination that except for the far eastern corner (area around Leachfield 7), the project site essentially lies outside the Zone of Contribution to the NMWD wells. In addition, due to the estimated travel time of 2.5 years, viral or bacterial concentration of any groundwater reaching the wells will most likely have attenuated to one of insignificance. The site complies with the Department of Health Services' Microbial/Direct Chemical Contamination Zone criterion of two-year time-of-travel. The estimated travel time and the wells' Zone of Contribution are not expected to change significantly due to the development.
- It was reasonable for the County to find that viral contamination to Lagunitas Creek is unlikely. The project site is set back horizontally more than 400 feet from the creek, compared to Marin County's stream setback requirement of 100 feet. It would not be appropriate to apply the DHS' Microbial/Direct Chemical Contamination Zone criterion to Lagunitas Creek because it is meant for the protection of drinking water supplies.

Issue #3: <u>Cumulative Impacts to Groundwater and Surface Water Quality</u>

Appellants' Consultant, FCE (1/28/2002)

- The FEIR and supplemental information do not provide any assessment of the potential impacts to water quality in Lagunitas Creek.
- A nitrate loading analysis, in accordance with guidelines established by the Marin County Environmental Health Service and based on an annual chemical-water mass balance, should be performed.

Applicant's Consultant, Questa (2/4/2002)

- The project actually will eliminate the existing agricultural non-point pollution sources and include provisions for control and treatment of 100% of storm runoff.
- Cumulative nutrient loading effects from properly sited/functioning septic systems, via shallow groundwater flow, are mitigated by the high rainfall conditions in Marin County combined with the vegetation uptake and soil denitrification provided by the wetland/riparian zone before reaching the Creek.
- There's 450 feet between the leach fields and the Creek.

Appellants' Consultant, FCE (2/10/2002)

- The nitrate loading analysis presented in the feasibility report considers whether the groundwater concentration of nitrate-nitrogen in certain target zones would exceed 10 mg/l of various scenarios of wastewater discharge. Lagunitas Creek was not one of the target zones considered. There needs to be an analysis of whether any nitrate would enter the creek because of the project and if it did what would be the impact.

Applicant's Consultant, Questa (3/5/2002)

- The project poses no potential nitrate impact on Lagunitas Creek because (1) it will only result in a net increase in nitrogen loading over existing conditions (with horses) of approximately 247 lb-N per year (507 lb-N overall), and (2) the 10+ acres of riparian area between the site and Lagunitas Creek can uptake and denitrify at least 1,310 lb-N per year (690 for vegetative uptake and 620 for soil denitrification).
- Comparing groundwater data from existing onsite and offsite wells shows that nitrate-nitrogen concentration decreases towards Lagunitas Creek.

Appellants' Consultant, FCE (3/18/2002)

- Questa failed to estimate nitrate loading using the most current and a higher estimated wastewater loading from the site. If the most up-to-date number were used, the computed nitrate-nitrogen concentration at the downgradient edge of the property would exceed 10 mg/L in an average year with 10% runoff.
- It was unrealistic to assume a complete mixing of a year's wastewater with all the groundwater recharged on the entire site within one average year in performing the nitrate loading analysis. Questa failed to provide any explanation on how this mixing can be achieved.
- A more thorough analysis of potential impacts to the NMWD wells should be conducted.

Applicant's Consultant, Questa (4/8/2002)

- There are several safety factors already built into the nitrate loading analysis:

1. The rainfall used in the water balance calculations was 33 in/year. Had 40 inches been used, as desired by some project opponents, the resultant nitrate-nitrogen concentration in the calculation would be lower by 15 to 20%.
2. The design storm for stormwater infiltration is the 100-yr, 24-hr storm event. This means that the annual site runoff post-development will be equal to or less than current conditions. Hence, the future runoff rate will likely be lower than the assumed rates of 5, 10, and 15% used in the nitrate loading analysis. This is corroborated by the HELP3 model suggested by FCE, which estimates the current runoff rate to be around 2.2%. The additional infiltrated rainwater entails more dilution and lower nitrate-nitrogen concentration.
3. Several of the affordable homes are designed to be only 2-bedroom units. However, they were all assumed to be 3-bedroom units in the nitrate loading analysis.
4. There's a very low likelihood of water supply well installation at the evaluation points in the nitrate analysis.

- The nitrate loading analysis performed uses an annual chemical-water mass balance approach in accordance with established guidelines contained in Marin County Sewage Disposal Regulations.
- The Chief Hydrogeologist with the California Department of Water Resources, Carl Hauge, has concurred with the design and execution of the hydrogeologic investigation to study travel time of groundwater to NMWD wells.

Third Party Peer Reviewer, PSOMAS

- PSOMAS concluded, after having reviewed all correspondence up to March 5, 2002, that "our peer review of these documents do substantiate the findings and responses of Questa. Their responses are backed up with appropriate and substantiated data and are based on current State and County design parameters and standard of care engineering practices."

CCC

- Staff disagrees with Questa that an additional safety factor had been incorporated in the nitrate loading calculations because all the affordable homes were assumed to have three bedrooms, instead of some having only two. According to the On-Site Sewage Disposal Feasibility Report, estimated wastewater flows for single family residences used in the nitrate loading analysis are set at 100 gpd/bedroom. There was no mention of basing each unit's overall flow on three bedrooms instead of two bedrooms even for those units with only two bedrooms. However, the County's approach is not reliant on this additional safety factor.
- The nitrate loading analysis contained in the feasibility report, as revised in the 4/5/2000 addendum, was performed using an annual chemical-water balance analysis. The methodology utilized was in accordance with criteria contained in Marin County Sewage Disposal Regulations. The requirements are to (1) ensure that groundwater at the nearest existing or potential location of water supply well not exceed 10 mg/L in nitrate-nitrogen, and (2) that the average groundwater nitrate-nitrogen concentration over the geographical extent of the subdivision should not exceed 10 mg/L. The results show that, using the standard septic systems as proposed, the average nitrate-

nitrogen concentration on-site would exceed 10 mg/L only when the estimated annual rainfall runoff rate is 10% or higher. The concentration at 15% runoff rate is estimated at 10.9 mg/L. At 5% runoff rate, however, the concentration is estimated at 9.64 mg/L. The derived concentration represents nitrate generated on-site and offsite contribution from the West Marin School. Because no water supply wells will be allowed on the project site, the information supports the County's determination that the estimated nitrate-nitrogen concentration does not present a problem. Furthermore, the actual rainfall runoff rate upon project completion is expected to be lower than 10% due to the stormwater BMPs' 100-year, 24-hour design storm. Conversely, this means the volume of rainwater infiltrated into the subsurface will increase to provide additional nitrate dilution. Therefore, the average concentration onsite will likely be lower than 10 mg/L and meeting the County's requirement.

- The County's determination is supported by the fact that the potential offsite water supply well location in the riparian/wetland area between the project site and Lagunitas Creek is 100 feet from the downgradient edge of the eastern part of the site. There, the estimated nitrate-nitrogen concentrations are all below 10 mg/L for the three projected runoff rates (5%, 10%, & 15%). Additional attenuation due to vegetation uptake and soil denitrification will most likely occur between this location and Lagunitas Creek as the creek is still more than 300 feet away.
- The information in the record, including information provided by the applicant's consultant and confirmed by the County's third party peer review, supports the County's determination that the cumulative nitrate impact on Lagunitas Creek will be insignificant for the following reasons:
  1. The 100-year, 24-hour design storm used for stormwater infiltration will ensure that the overall rainwater contribution to the subsurface will not decrease after development. The infiltrated rainwater will provide dilution for nitrate concentration.
  2. Cumulative nitrogen contribution from the post-development wastewater flow on the site's eastern portion represents roughly a 54% increase from the current nitrogen loading resulting from onsite horse grazing and the West Marin School. Previous monitoring using onsite and offsite wells showed the average onsite concentration to be 2.4 mg-N/L, compared to the average concentration of 0.3 mg-N/L for the four off-site wells. The decrease in concentration from onsite to offsite locations confirmed the natural nitrate attenuation capacity available in the subsurface.
  3. There are 10+ acres of wetland meadow and riparian woodland between the project site and Lagunitas Creek, representing an approximately 450-foot horizontal setback from the creek. This area will provide soil denitrification and vegetative uptake of nitrate. Questa is estimating a minimum of 1,310 lb per year nitrogen removal capacity for this area, more than enough to handle the predicted combined loading of 705 pounds from the site's eastern portion and the West Marin School.
  4. The post-development monitoring program to be implemented will ensure the minimization of offsite nitrate migration. Either the existing offsite monitoring wells on the Coast Guard property will be used or monitoring at the downgradient edge of the site will be performed with nitrate action levels to be established for

these property edge locations. Exceedance of these action levels would trigger implementation of the contingency plan. Contingency measures potentially include diversion of problematic wastewater flows to the reserve fields and/or the construction of pretreatment systems to improve the denitrification capacity and efficiency of the septic systems.

5. Prior to recordation of the final maps for the residential or visitor-serving uses, approval of the subdivision improvement agreement, or issuance of a grading permit, whichever occurs first, the County's Environmental Health Services Division will issue a letter confirming that the wastewater and stormwater systems' design would adequately address, among others, the potential for nitrate contamination of Lagunitas Creek. This letter has to include written documentation of compliance with County regulations and receive approval by the Executive Officer of the RWQCB.

Issue #4: Stormwater Management

Appellants' Consultant, FCE (1/28/2002)

- The proposed stormwater infiltration system, especially the western part, will be hydraulically overloaded due to high groundwater conditions at the site.
- FCE recommends that the drainage analysis be expanded to assess the condition of the downstream drainage and to recommend mitigation measures to prevent impacts (most notably erosion) from occurring if the onsite drainage systems are inadequate to contain runoff, as proposed.
- The FEIR does not assess pre- and post-project site-specific and cumulative impacts to the hydrology of Lagunitas Creek.

Applicant's Consultant, Questa (2/4/2002)

- The Williams Street area, where grass swales are included as an integral part of the drainage system, is designed to contain and percolate the stormwater very near the source of runoff, in order to most closely mimic the existing hydrology.
- The existing on-site runoff facilities are designed to handle runoff from the 100-yr, 24-hr storms. This is way above any normal stormwater control capacity required by the County. By controlling this amount of runoff, downslope offsite impacts due to runoff will be minimized. This ensures that there will be no increased runoff reaching the town or Lagunitas Creek.
- Because of this almost total containment of runoff from the site, this project actually will be beneficial to the creek and town in terms of NPS pollution.

Appellants' Consultant, FCE (3/18/2002)

- The hydraulic analysis performed by Questa only evaluated short-term drainage capacity of the specific infiltration trenches for the 24-hour design storm events. The analysis did not take into consideration the ability of the site to accommodate the runoff over the course of the year and what potential impacts these changes will have on the proposed wastewater systems.
- Stormwater from the West Marin School and Williams Apartments will be directed to the existing wetlands. FCE was unable to locate any drainage analysis that

demonstrates that the existing wetlands have sufficient capacity to detain or retain this runoff.

Applicant's Consultant, Questa (4/8/2002)

- It was reasonable for the County to reject the Appellants' conclusions regarding hydraulic conductivity calculation. The USACE HELP3 model used by FCE actually supports Questa's hydraulic conductivity calculations. Using the lower K selected by FCE, the model would predict a depth to groundwater of approximately 2.5 feet at the end of April in a year receiving 46.5 inches of rain. However, Questa's test pits in April 1998 (the year with 60 inches of rain) yielded depths greater than 7 feet in the lower part of the site. This shows that the K used by FCE is much too low.
- The proposed drainage plan calls for runoff from the access road, parking areas, building downspouts, and other paved areas to be directed to grassed swales and infiltration trenches located in immediately adjacent areas, in order to retain as closely as possible the existing hydrologic regime. None of the swales or infiltration trenches will extend within 100 feet of any existing wetland.

Third Party Peer Reviewer, PSOMAS

- While storm flows greater than those generated in the 100-year, 24-hour storm events will produce some offsite runoff, this runoff, however, would not include the agricultural constituents contained in the current runoff. "In addition, runoff from the earlier stages (i.e., first flush) of events larger than the design event would be treated, and the project would result in no increase in post-development runoff volumes from the design event."
- PSOMAS concluded, after having reviewed all correspondence up to March 5, 2002, that "our peer review of these documents do substantiate the findings and responses of Questa. Their responses are backed up with appropriate and substantiated data and are based on current State and County design parameters and standard of care engineering practices."

CCC

- The information in the record, including the information provided by the applicant's consultant and confirmed by the County's third party peer review, supports the County's determination that the site has the capacity to absorb the combined loading of rainwater and wastewater. As stated above, the overall volume of rainwater infiltration to the subsurface is not expected to change significantly upon project completion due to the big design storm for the stormwater BMPs. As such, the groundwater mounding analysis performed by Questa using predevelopment groundwater data (data taken in April 1998 and March 2000, after higher-than-normal precipitations) does provide useful and realistic insights to the potential mounding conditions as a result of adding the wastewater flow, notwithstanding the lingering dispute over the validity of the hydraulic conductivity used in the calculations. Based on these results, the site's subsurface environment does seem to possess the capacity to handle the combined loading from rainwater and wastewater. Hydraulic overloading on the western portion is therefore not expected.

Correspondence

Ms. Loretta K. Barsamian
Executive Officer
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

April 11, 2002

Dear Ms. Barsamian,

We are writing with regard to the Ecumenical Housing Association's affordable housing project in Point Reyes Station. The Environmental Action Committee of West Marin supports affordable housing in West Marin and we have worked hard with EAH and the County to ensure that this project will benefit our community, both socially and environmentally.
As you may know, this is an unusual project in several respects.

- It is technically quite complex and of a design and density unprecedented in West Marin. As currently proposed, it will have three large-flow conventional septic systems with pressure-dosed distribution, one system for a public toilet for Point Reyes Station, seven small-flow conventional systems, and one or two mound systems.
- It is designed to keep all project-generated storm water run-off on site. Most projects of this density are able to channel surface run-off and storm water infiltration off-site so that the site's absorptive capacity can be dedicated to wastewater disposal; however Point Reyes Station does not have a storm water drainage system.
- There has not been long-term groundwater monitoring at the level of the drain lines, so questions remain regarding the site's wastewater and storm water infiltration capacity. Historically, the site has very high levels of surface run-off in the winter and previous studies have found seasonally high groundwater levels there.
- The project engineer's own figures show that the project will result in nitrate-loading that is near or over the legal limit for drinking water and that exceeds the County's and the Regional Board's action limit for nitrate-loading. Some of the mitigations proposed to deal with this problem are off-site; others involve on-site wetlands. No calculations have been done to determine what the impacts of the mitigations will be.
- The project has the potential to affect drinking water wells operated by the North Marin Water district and Lagunitas Creek, which is a tributary to Tomales Bay and which itself supports 10 percent of the remaining population of the federally endangered coho salmon.

Therefore, we are pleased that the Regional Water Quality Control Board will review and approve the project's wastewater and storm water systems before the construction and operating permits for the systems are issued by the County. We are relying on you and your staff to

thoroughly review the final project design and to recommend whatever changes are necessary to ensure that public health and the environment are protected.

Like many in West Marin, we want the EAH housing project to work, but this means that it must protect public health and the environment as well as providing much-needed affordable housing. If all the environmental and health issues are not satisfactory resolved before permits are issued, the cost will be high: not only the financial cost of trying to solve the problems retroactively, but also the cost to public health, to environmental safety, and to future affordable housing proposals for Marin County.

We appreciate your support.

Sincerely,

Catherine Caufield
Executive Director
cc: Lamar Turner, Alex Hinds, Steve Kinsey, Peter Douglas

STEVE KINSEY
SUPERVISOR
4th District County of Marin

April 24, 2002

The California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219

RE: 1) Support for approval of the Local Coastal Program amendment for the Point Reyes Affordable Housing Project proposed by the Ecumenical Association for Housing and 2) Recommendation to uphold the Marin County Board of Supervisors approval of a coastal permit

Dear Commissioners,

As the County Supervisor for a district that encompasses a lengthy coastline, I am very aware of the complex role your Commission plays in balancing protection of our natural resources and visitor and community needs. The Point Reyes Affordable Housing project is a highly beneficial effort which balances all of these issues, combining desperately needed affordable rental and for-purchase units with visitor serving opportunities, while ensuring protection of the adjoining creek and wetlands.

This project has received an astonishing degree of community support, which is a tribute to the lengthy and highly collaborative process that was sponsored by the Project Applicant, the Ecumenical Association for Housing. This strong endorsement by local residents is also indicative of a dramatic need for affordable housing – an issue which is heightened as housing costs escalate and as residential housing is converted to short term accommodations. I am especially pleased that the project has identified affordable visitor-serving uses on the commercially zoned portion of the property, in addition to providing public restroom facilities.

Regarding the one issue that has been somewhat controversial, wastewater disposal, there has been a remarkable effort to bring together all concerned parties, including Coastal Commission staff. I am confident that the process that has been established to permit the waste disposal systems will prevent any negative impacts, and will satisfy the responsible agencies.

I urge you to recognize the unique balance and essential benefits provided by this undertaking. I encourage you to approve Local Coastal Program amendment and uphold the Marin County Board of Supervisors' unanimous endorsement of the project. I would also like to thank your staff for the significant time that has been spent on this project as it has moved through both the County's and the Commission's review processes.

Please contact me at any time if you have questions.

Sincerely,

Steve Kinsey
Marin County Supervisor

Marin County Civic Center
3501 Civic Center Dr., Suite 329
San Rafael, CA 94903
Phone 499-7331 Fax 499-3649
E-mail skinsey@marin.org
Officeholder ID# 970527

ed on recycled paper

2169 East Francisco Boulevard, Suite B
San Rafael, CA 94901
415-258-1800
415-453-4927 Fax

Point Reyes Affordable Homes, Inc.

April 19, 2002

Sarah L. Borchelt
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105-5400

RE: Point Reyes Affordable Housing

Dear Ms. Borchelt:

We are writing this letter to clarify timing issues related to the financing for the Point Reyes Affordable housing development.

From inception, EAH's goal in the Point Reyes housing development has been to create permanent affordable housing for local workers. The goal will be impossible to attain without over $3,000,000 in critical financing from the Low Income Housing Tax Credit program for the 27 one, two and three bedroom family rental units.

The Low Income Housing Tax Credit program is the single biggest engine driving the development of affordable housing in the nation. In California, like in many other states, the program has become so popular that the state has created highly competitive regulations to determine which projects receive awards. In most recent years, only about one in four project applications successfully received awards. This year California sponsored two application rounds – March 26, and July 16. We have already submitted an application for the Pt. Reyes project in the March round, knowing that the first round was likely to be less competitive. The state will announce successful first round applications on May 29.

Should an applicant receive an allocation of tax credits, and subsequently fail to use those credits within a scheduled time period, the applicant receives a penalty. This penalty takes the form of "negative points" scored against all applications submitted by the applicant in the following two years. The impact of this penalty is so onerous, that EAH can not take unnecessary chances with its future tax credit affordable housing developments. Accordingly, if the Point Reyes affordable housing project fails to receive approval from the California Coastal Commission in the early May hearing, EAH will have no choice but to withdraw the tax credit application from competition in the first round before any potential allocation can be

granted. This would take the project out of the lesser competitive first round, leaving only one further chance in July to compete for tax credits. Failure to receive a tax credit allocation in these two rounds greatly increases the risk that the project will never be built.

If you have questions or need additional information about the Low Income Housing Tax Credit program, or any other matter regarding the Point Reyes affordable housing application please feel free to contact Lamar Turner at (415) 258-1800 X 27.

Sincerely,

Lamar Turner

Lamar Turner
Senior Project Manager

Marin County
Community Development Agency

Alex Hinds, Director

April 24, 2002

Lamar Turner
Point Reyes Affordable Homes Inc.
c/o Ecumenical Association for Housing
2169 E. Francisco Boulevard, Suite B
San Rafael, California 94901

Re: Point Reyes Affordable Homes Local Coastal Program Amendment and Coastal Permit
857 Mesa Road, Point Reyes Station
Assessor's Parcels 119-240-45, -46, -57, -58

Dear Mr. Turner:

As you know, on March 19, 2002, the Marin County Board of Supervisors voted to approve the Coastal Permit for the Point Reyes Affordable Homes development and to recommend approval of an amendment to the Local Coastal Program by the California Coastal Commission. Over the past two years, this project has undergone a rigorous and extensive review by the County and independent consultants for all aspects of development, including the feasibility of the proposed on-site stormwater and wastewater systems, and project impacts on the coastal environment.

Recently concerns have been raised about the feasibility of the proposed on-site stormwater and wastewater disposal systems and pertaining to the depth of unsaturated soil beneath the proposed wastewater systems, nutrient loading impact to coastal waters, and hydrologic effects between on-site stormwater and waste water systems.

In their action to approve the proposed development, the Board of Supervisors imposed stringent requirements to ensure that the final design of the stormwater and wastewater systems would comply with County regulations and required final review and approval of various components of the plan by the Regional Water Quality Control Board's Executive Officer prior to the County's issuance of construction permits. Their action further incorporated all of the recommendations for conditions of approval that were requested by the Regional Water Quality Control Board's staff. These include provisions for monitoring and contingencies and requirements for a renewable operating permit for each component of this development.

A key component of our stormwater and septic regulation for the project is the requirement for preparation and approval of an Operation, Maintenance, and Monitoring Program and Contingency Plan ("Plan") prior to construction. The Plan will identify requirements for water quality monitoring, repair/replacement of malfunctioning equipment, and other remedial measures to handle unexpected problems with the sewage and stormwater systems, and will include the following components:

- A detailed description of how each system and relevant individual components are intended to function;
- Identification of the maintenance, monitoring, and financial requirements for the systems, including the entity that would be responsible for these responsibilities;
- A listing of all scheduled routine preventative maintenance activities to ensure proper system maintenance and performance;
- Procedures for monitoring of ground water quality, including installation of both upgradient and downgrading monitoring wells and observation ports;

- Provisions for a contingency component that contains detailed actions to be taken in the event of equipment or system malfunction, due to unforeseen problems related to non-compliance with design criteria or ambient condition criteria;
- Requirements to incorporate thresholds as part of the monitoring component that would trigger implementation of the remedial measures in the contingency component; and
- Requirements for the establishment of the necessary easements, infrastructure, and agreements for the use of additional backup reserve areas that could be used to enhance or replace leachfields for the individual homes within the Papermill Creek Homes.

In order to maximize long-term protection of the on-site wetlands, the Board of Supervisors also required approval by the Regional Board Executive Officer of a long-term wetland protection plan which contains measures to preclude adverse impacts to the protected wetlands onsite, monitoring the condition of these wetlands, and implementation of contingency measures in the event the wetlands are adversely impacted by future uses.

Overall, we believe these requirements, in addition to other imposed mitigations, will serve to maximize the protection of groundwater, wetlands, and other coastal resources.

Sincerely,

Alex Hinds Philip D. Smith

Alex Hinds, Director

Philip D. Smith
Chief, Environmental Health Services

Cc: Supervisor Steve Kinsey
Peter Douglas, California Coastal Commission
Blair Allen, Regional Water Quality Control Board
Point Reyes Village Association
Tomales Bay Association
Elena Belsky
EAC of West Marin

Cur/tkl/projects/prah/ccc-letter

California Regional Water Quality Control Board
San Francisco Bay Region

Winston H. Hickox
Secretary for Environmental Protection

1515 Clay Street, Suite 1400, Oakland, California 94612
Phone (510) 622-2300 ∃ Fax (510) 622-2460
Internet Address: http://www.swrcb.ca.gov

Gray Davis
Governor

April 24, 2002
File No.2158.06 (BDA)

Mr. Peter Douglas, Executive Officer
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219

SUBJECT: Point Reyes Affordable Homes Project, Point Reyes Station, Marin County - Regional Water Quality Control Board Recommendations for Marin County's Conditions of Approval

Dear Mr. Douglas:

The purpose of this letter is to confirm that recommendations regarding conditions of approval for the Point Reyes Affordable Homes Project, as stated in our March 18, 2002, letter to the County of Marin, were sufficiently incorporated into the County's Conditions of Approval for the Project, which were adopted by the Marin County Board of Supervisors on March 19, 2002.

Our letter identified seven (7) specific conditions that we requested be included in the Conditions of Approval for the Project. These conditions are necessary to ensure that the Project is protective of water quality and focus on three general topics: wastewater system design, adequacy, operation, maintenance, monitoring and permitting; protection of existing on-site wetlands; and storm water management system operation and maintenance.

In accordance with the County's Conditions of Approval, these water quality issues must be resolved to our satisfaction before the County can issue permits necessary for project construction. We are working with the project applicant, the County Environmental Health Services staff and members of your staff to address these issues. We are confident that these issues will be appropriately addressed before the Project receives final permit approvals from the County. As long as the County resolves these issues, the Regional Board does not anticipate adopting Waste Discharge Requirements for the Project.

If you have any questions about this matter, please contact me at (510) 622-2443, or Blair Allen of my staff at (510) 622-2305.

Sincerely,

Bruce Wolfe

Bruce Wolfe, Chief
Watershed Management Division

cc: Tom Lai, Marin County Planning Department
Lamar Turner, Ecumenical Association for Housing

QUESTA ENGINEERING CORP.
Civil, Environmental & Water Resources

April 24, 2002

Ms. Sarah Borchelt
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219

Subject: Appeal No. A-2-SMC-02-009; Point Reyes Affordable Housing Project, Marin County

Dear Ms. Borchelt:

This letter is provided in response to the subject appeal filed by Mark Warner, Elena Belsky and the Tomales Bay Association regarding the Coastal Permit Decision of the Marin County Board of Supervisors for the Point Reyes Affordable Housing Project in Point Reyes Station, Marin County. The Ecumenical Association for Housing is the Project Applicant.

In responding to the appeal, we have several general comments that we would like to make, followed by direct responses to the four specific issues listed by the Appellants.

General Comments

The issues raised by the Appellants are related strictly to the septic system, stormwater-drainage and water quality aspects of the project. They cite as the basis for their appeal, information provided by their consultant, Fall Creek Engineering (FCE), which is detailed in three letters, dated January 28, 2002, February 10, 2002, and March 18, 2002. The letters were submitted to Marin County on the day of, and in one case the day before, the project hearings before the Marin County Planning Commission and Board of Supervisors. Detailed technical responses, refuting the opinions and claims of Fall Creek Engineering, were provided in letters of February 4, 2002, March 5, 2002, and April 8, 2002, and in direct testimony before the Marin County Planning Commission and Board of Supervisors from the Project Environmental Engineer (Questa Engineering Corporation). Additional peer review by the EIR consultant (PSOMAS) and the Chief Hydrogeologist for the State Department of Water Resources was also provided to and considered by the Marin County Board of Supervisors prior to their decision to certify the EIR and approve the project.

1. Thoroughness of Site Investigation. In reviewing the various letters and other supporting documentation, it should be readily apparent that, contrary to the claims of the Appellants, the proposed project site has been investigated very extensively and thoroughly with respect to site conditions and requirements that affect the feasibility and associated environmental impacts of the onsite wastewater disposal and stormwater-drainage facilities for the project. This work has included:

- **Soil Profile and Wet Weather Groundwater Observations** - 88 test pits at various locations, in April 1998 (El Nino), January, March and October 2000, and April 2002 (for

system design).

- **Percolation Testing** - 143 percolation tests at various depths and locations throughout the project site, with consistently excellent results.

- **Hydrogeologic Investigation** - 10-month long hydrogeologic study, including installation, water level monitoring, and water quality sampling of four on-site and four off-site monitoring wells (16 to 40-feet deep) to define the local groundwater system vis-a-vis the North Marin Water District Wells and Lagunitas Creek.

In contrast, the Appellants' case is based on speculation about site conditions obtained from a single one-day drive/walk-by observation of the property by Fall Creek Engineering in December 2001.

2. Compliance with Standards and Best Management Practices. Contrary to the assertions of the Appellants, the proposed onsite septic systems and stormwater-drainage system for the project comply fully with Marin County regulations and practices. Additionally, as a result of mitigation measures identified in the EIR and in the Conditions of Approval, the project design is required to meet performance standards that exceed adopted regulations and requirements. Some of the inherent and additional environmental safeguards included in the project include:

- **Distance to Lagunitas Creek.** The proposed onsite septic systems for the project are all more than 500 feet laterally from Lagunitas Creek, as compared with the standard setback requirement of 100 feet. The estimated travel time for groundwater from beneath the project site to the Creek is more than one year.

- **Setback from Onsite Wetlands.** The proposed onsite septic systems for the project are all located a minimum distance of 100 feet downslope (one system is lateral) from the seasonal, hillside wetlands in the center of the project site. The Marin County leachfield setback requirement for seasonal wetlands is normally 75 feet.

- **Operating Permit Requirements.** The proposed onsite septic systems, which are all standard leachfields except for one mound system, will be monitored in accordance with conditions to be established in renewable Operating Permits issued by Marin County. Operating Permits are normally required only for Alternative Systems (such as mounds).

- **Onsite Drainage Retention Requirements.** In accordance with widely recommended stormwater Best Management Practices, the drainage design for the project includes extensive onsite retention measures (grassed swales and infiltration drainage trenches) to maintain site hydrology consistent with existing conditions. As a result of mitigation measures identified in the EIR, the drainage infiltration design is required to have capacity to retain the excess volume of runoff generated by a 100-yr, 24-hour storm event.

This far exceeds standards applied to any other project in Marin County; and the project site has sufficiently deep, well-drained soil conditions to meet this standard.

3. Lack of Project Understanding by Appellants. Although the letters from Fall Creek Engineering appear well-written and technical, the opinions expressed were formed without reviewing all of the available background material and without speaking to the project applicant or engineers, the EIR consultants, or County staff to obtain a proper understanding of the project plans. As a consequence of this self-imposed restriction, as late as their March 18th letter, Fall Creek Engineering had still apparently not reviewed available information regarding wet weather groundwater conditions included with the project application, and continued to demonstrate misunderstanding of the design concept, capacity requirements, and supporting calculations for the onsite drainage infiltration facilities plan.

Specific Issues

The Appellants identified four specific, what they term, "unresolved issues" regarding the wastewater and stormwater facilities for the project that they believe have been inadequately addressed in the planning and environmental review process. Detailed responses are provided in the above-referenced letters from Questa Engineering. Following is a brief summary of the responses to each of the specific issues raised by the Appellants.

1. Soil Storage Capacity for Stormwater and Wastewater. As described in the project plans and noted above, the stormwater-infiltration drainage system is designed to retain rainfall-runoff in a way that matches existing conditions as closely as possible. The soil conditions in areas planned for drainage infiltration facilities are very permeable and well drained with sufficient capacity to meet this objective. This is evident from the published USDA Soil Survey for the area and documented through extensive soil profile test pits, groundwater observations and percolation testing during several above-average rainfall years (including El Nino Year). The onsite septic systems and drainage infiltration facilities are sufficiently isolated from one another to avoid any interference. Additionally, consideration of the potential "groundwater mounding" effects from onsite septic systems was taken into consideration in the siting and layout of these systems across the site. Analysis of the groundwater mounding effects was completed in accordance with guidelines contained in Marin County septic system regulations to confirm the suitability of the proposed project plans and compliance with County requirements.

2. Hydrogeological Investigation of Impacts to Water Wells and Lagunitas Creek. The Appellants are not specific about their criticism of the hydrogeological study, other than indicating that they believe it wasn't done correctly. The hydrogeological investigation workplan was reviewed by North Marin Water District before the study was undertaken. Additionally, the study completed by Questa Engineering was reviewed independently by Carl Hauge, Chief Hydrogeologist with the California Department of Water Resources, who found that the study was properly designed

and executed. He concurred with the findings and conclusions of the investigation and reported this to the Marin County Environmental Health Services in advance of the March 19, 2002, Board of Supervisors' hearing on the project.

3. **Cumulative Nitrate Impacts to Groundwater and Surface Water Quality.** Assessment of cumulative "nitrate" impacts of the project were not only completed in accordance with Marin County guidelines, from the very beginning they formed the basis on which the "carrying capacity" of the site was determined, which in turn guided the overall planning of the size and layout of the project. In their initial review letter of January 28, 2002, when they identified the cumulative impact issue, FCE was unaware that this evaluation had already been completed. Later when they realized their mistake and could not argue with the results, they took issue with the County guidelines for cumulative nitrate impact analysis. Marin County is the only county in California with adopted requirements, guidelines and criteria for assessment of cumulative impacts of onsite wastewater systems. Marin County's requirements have been reviewed and approved by the San Francisco Bay Regional Water Quality Control Board and have been in effect since 1994.

4. **Stormwater Runoff-Hydrology Impacts.** By design, the project has been planned to eliminate off-site (cumulative) impacts to water quality and downstream drainage systems. The drainage design is based on incorporation of extensive infiltration drainage measures for roof drains and street runoff. The system is planned with capacity to retain the excess volume of runoff generated by a 100-yr, 24-hour storm event, which is more than adequate to assure protection of downstream storm drainage systems in the Town of Pt. Reyes and the adjacent Coast Guard property. The drainage standards adopted for the project exceed requirements applied to any other project in Marin County. Extensive site investigations over the course of several above-average rainfall years (since 1998) have confirmed the presence of sufficiently deep, well-drained soil conditions to meet this objective.

We appreciate the opportunity to provide these comments on the Appeal of the Point Reyes Affordable Housing Project and will be present at the upcoming hearing before the Coastal Commission to formally present this information and answer any questions that arise.

Sincerely,

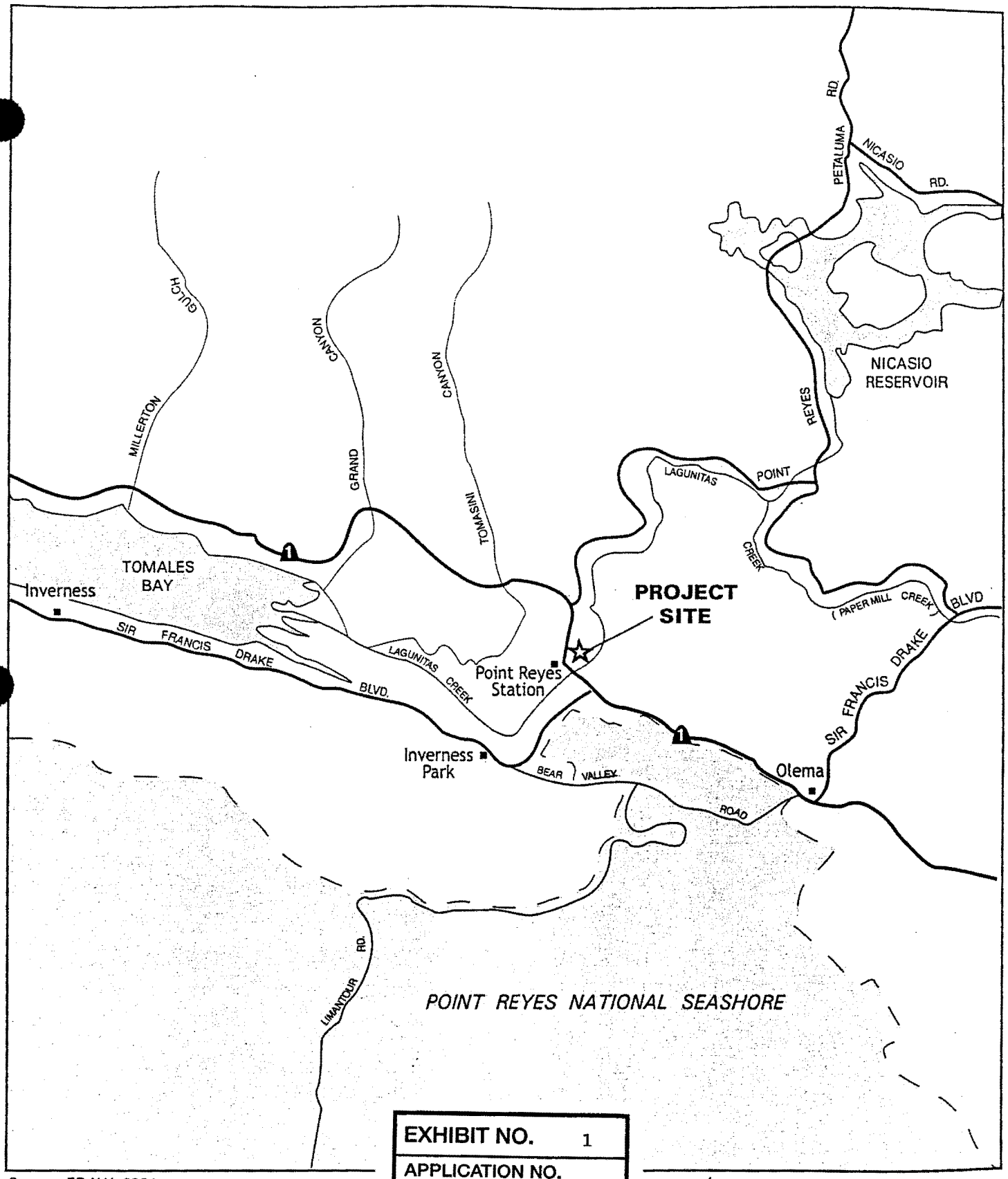
Norman N. Hantzsche, P.E.
Principal/Managing Engineer

xc: Lamar Turner, EAH
Tom Lai, Marin County Community Development Agency
Phil Smith, Marin County Environmental Health Services

ref.99299CoastalAppealResponse

Exhibits

Exhibit 1 ..... Location Map
Exhibit 2 ..... Wetland Delineation
Exhibit 3 ..... Site Plan
Exhibit 4 ..... Wastewater Treatment and Disposal Plan
Exhibit 5 ..... Storm Water Treatment and Disposal Plan
Exhibit 6 ..... Marin County Conditions of Approval
Exhibit 7 ..... Appeal of Belsky, Warner, and Tomales Bay Association
Exhibit 8 ..... Appeal of Commissioners Desser and Reilly



Source: EDAW, 2001.

EXHIBIT NO. 1
APPLICATION NO. A-2-MAR-02-009
POINT REYES AFFORDABLE HOUSING INC.

Local Setting

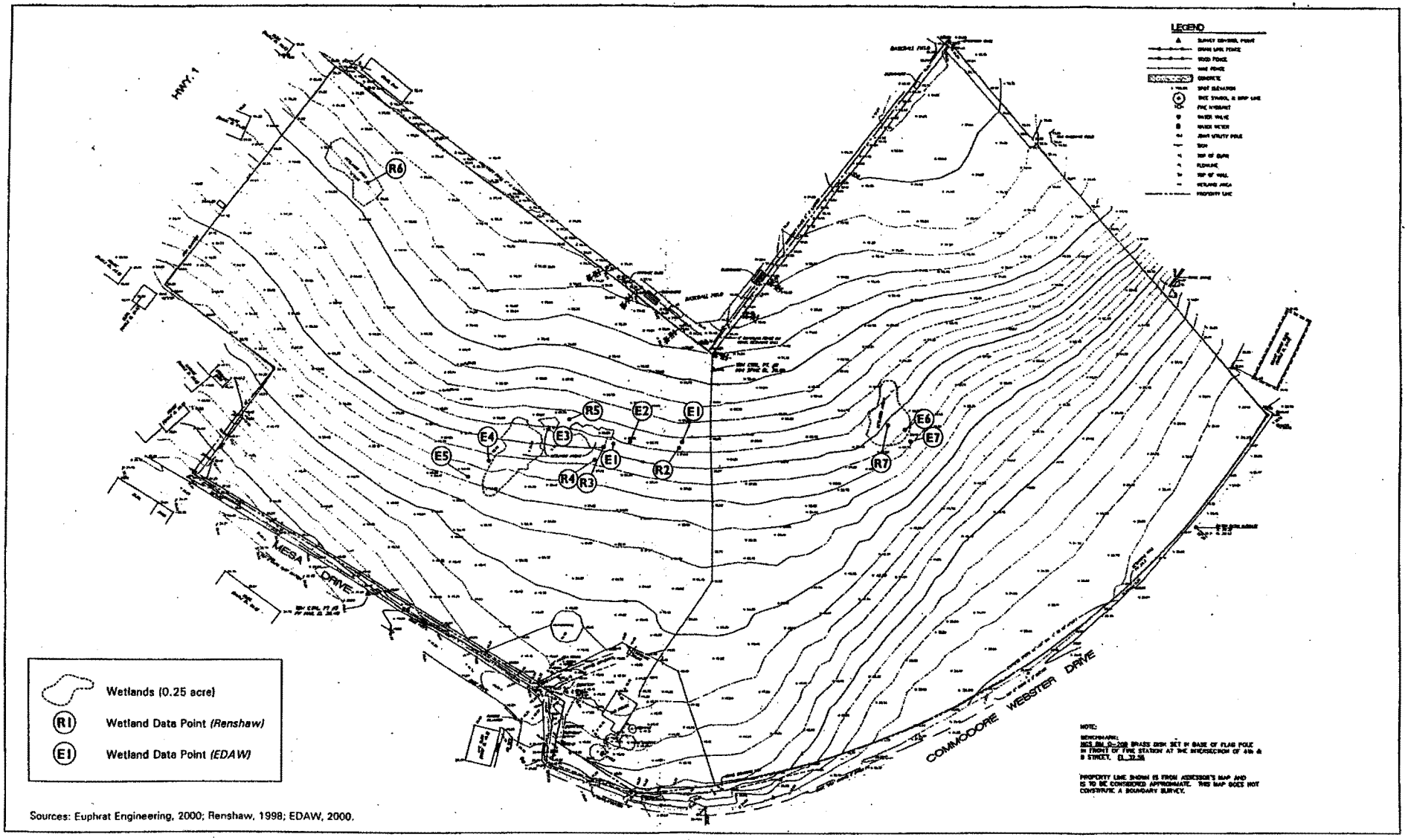
EXHIBIT 3-3

Point Reyes Affordable Housing EIR
MARIN COUNTY
JN 0T053.01 11/00

0 1/4 1/2 1 MILES

NORTH

EDAW



Sources: Euphrat Engineering, 2000; Renshaw, 1998; EDAW, 2000.

Wetland Map

Point Reyes Affordable Housing EIR
MARIN COUNTY
JN 0T053.01 4/01

EXHIBIT 4.13-1

0' 50' 100' 200' NORTH

EDAW

EXHIBIT NO. 2
APPLICATION NO. A-2-MAR-02-009
POINT REYES AFFORDABLE HOUSING INC.

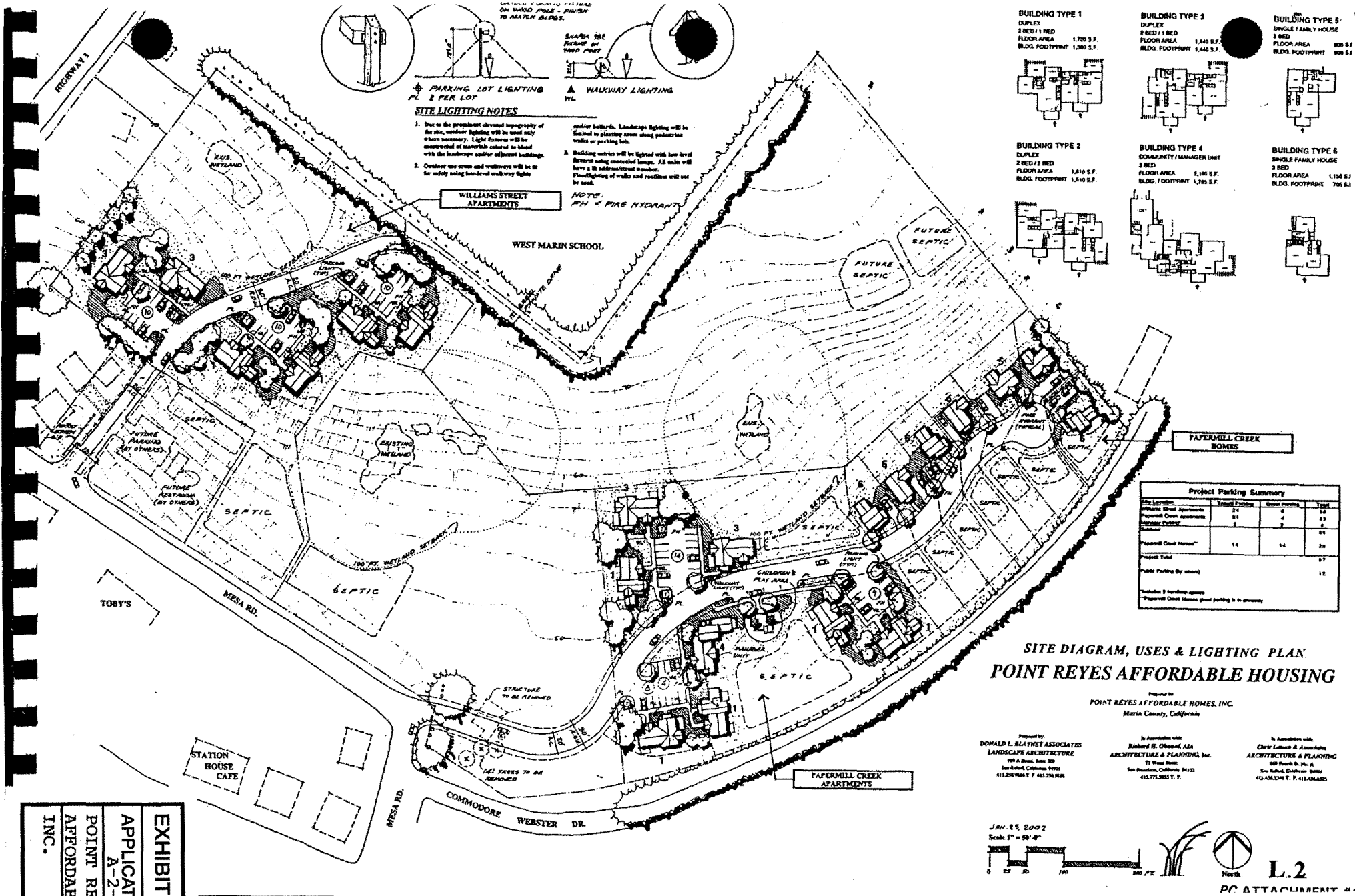


EXHIBIT NO. 3

APPLICATION NO. A-2-MAR-02-009

POINT REYES AFFORDABLE HOUSING INC.

PC ATTACHMENT #10

BENCHMARK:
NGS BM D-208 BRASS DISK SET IN BASE OF FLAG POLE IN FRONT OF FIRE STATION AT THE INTERSECTION OF 4th & B STREET. EL 32.94

PROPERTY LINE SHOWN IS FROM ASSESSOR'S MAP AND IS TO BE CONSIDERED APPROXIMATE. THIS MAP DOES NOT CONSTITUTE A BOUNDARY SURVEY.

GRAPHIC SCALE
(IN FEET)
1 inch = 20 ft.

HWY 1

WILLIAMS ST. APARTMENTS

FARM PARCEL

PROPOSED PRIMARY AND RESERVE AREA FOR MOUND SYSTEMS (4-BEDROOM CAPACITY)

INDIVIDUAL AFFORDABLE OWNERSHIP HOMES

PUBLIC RESTROOM LEACHFIELD; PRESSURE-DOSED 36" DEEP TRENCHES DUAL 450 gpd FIELDS (MIN.)

PUBLIC RESTROOM

WILLIAMS ST. APARTMENTS LEACHFIELD; PRESSURE-DOSED 36" DEEP TRENCHES DUAL 2,700 gpd FIELDS

MESA DRIVE

FUTURE COMMERCIAL LEACHFIELD; PRESSURE-DOSED 36" DEEP TRENCHES DUAL 1,520 gpd FIELDS (MIN.)

PAPERMILL CREEK AFFORDABLE APARTMENTS

FUTURE COMMERCIAL

UPPER LEACHFIELD

LOWER LEACHFIELD

WEBSTER DRIVE

COMMODORE

5' MIN. (TYP.)

25' SETBACK TO DOWNSLOPE PROPERTY LINE

5' DRAINAGE EASEMENT (PIPELINE ONLY)

15' DRAINAGE EASEMENT (PIPELINE ONLY)

50' SETBACK TO DRAINAGE - INFILTRATION EASEMENT (TYP.)

15' DRAINAGE INFILTRATION EASEMENT

LEACHFIELD AREA FOR INDIVIDUAL OWNERSHIP HOMES (TYP.); EACH SYSTEM 3-BEDROOM CAPACITY (315 gpd, DUAL FIELDS), 36" DEEP TRENCHES LOTS 1-4, 7 48" DEEP TRENCHES LOTS 5 & 6

50' MIN. TO DRAINAGE INFILTRATION AREA

25' MIN. TO DOWNSLOPE PROPERTY LINE (TYP.)

PAPERMILL CREEK APARTMENTS LEACHFIELD; PRESSURE-DOSED 36" DEEP TRENCHES, UPPER FIELD: 1,700 gpd (MIN.) LOWER FIELD: 5,100 gpd (MIN.)

5' DRAINAGE EASEMENT (PIPELINE ONLY)

DRAINAGE INFILTRATION AREA

25' MIN. (TYP.)

5' MIN. (TYP.)

10' (TYP.)

50' MIN.

NOTE:

LEACHFIELDS TO BE INSTALLED WITHIN DESIGNATED DISPOSAL AREAS. ACTUAL DUAL LEACHFIELDS MAY NOT UTILIZE ENTIRE AREA SHOWN.

TOPOGRAPHIC LEGEND

- SURVEY CONTROL POINT
- CHAIN LINK FENCE
- WOOD FENCE
- WIRE FENCE
- CONCRETE
- SPOT ELEVATION
- TREE SYMBOL & DRIP LINE
- FIRE HYDRANT
- WATER VALVE
- WATER METER
- JOINT UTILITY POLE
- SIGN
- TOP OF CURB
- FLOWLINE
- TOP OF WALL
- PROPERTY LINE

WASTEWATER LEGEND

- GROUNDWATER TEST PIT
- SOIL PROFILE TRENCH
- PERCOLATION TEST HOLE
- WETLAND AREA
- GREATER THAN 12% SLOPE
- 100-FOOT WETLAND SETBACK AREA
- PROPOSED DISPOSAL AREA (>200ft SHOWN)
- MONITORING WELL

POINT REYES AFFORDABLE HOMES, INC.

POINT REYES AFFORDABLE HOUSING PROJECT
POINT REYES STATION, CALIFORNIA

QUESTA Civil Environmental Water Resources
P.O. Box 96264 1220 Wilkins Ave Richmond, CA 94807

No.	Rev	Date	By	Description	Appr'd
PR-2	1	2-19-99	LJ	[illegible]	N.H.
PR-2	2	11-13-98	LJ	[illegible]	N.H.
PR-2	3	1-19-98	LJ	[illegible]	N.H.

Design N.H.
Drawn L.J.
Checked N.H.
Appr'd N.H.

WASTEWATER TREATMENT & DISPOSAL SITE PLAN

POINT REYES AFFORDABLE HOUSING
POINT REYES STATION, CALIFORNIA

Rev D | Dwg. No. 99299 01 | Rev 3

PC ATTACHMENT #18

EXHIBIT NO.
APPLICATION NO.
A-2-MAR-02-009
POINT REYES AFFORDABLE HOUSING INC.

BENCHMARK:
NGS DN. C-208 BRASS DISK SET IN BASE OF FLAG POLE IN FRONT OF FIRE STATION AT THE INTERSECTION OF 4th & B STREET. EL. 32.58

PROPERTY LINE SHOWN IS FROM ASSESSOR'S MAP AND IS TO BE CONSIDERED APPROXIMATE. THIS MAP DOES NOT CONSTITUTE A BOUNDARY SURVEY.

TOPOGRAPHIC LEGEND

- CITY CONTROL POINT
- CHAIN LINK FENCE
- WOOD FENCE
- WIRE FENCE
- CONCRETE
- SPOT ELEVATION
- TREE SYMBOL & DRIP LINE
- FIRE HYDRANT
- WATER VALVE
- WATER METER
- JOINT UTILITY POLE
- SIGN
- TOP OF CURB
- FLOWLINE
- TOP OF WALL
- PROPERTY LINE

GRAPHIC SCALE
(IN FEET)
1 inch = 30 ft.

HWY. 1

BASEBALL FIELD

24" DEEP INFILTRATION TRENCH FOR ROOF DRAINAGE (TYP.)

GRASS SWALE 1.5' DEEP x 7' WIDE (TYP.)

4.5' DEEP INFILTRATION DRAINAGE TRENCHES (TYP.)

MESA DRIVE

36" DEEP INFILTRATION TRENCH FOR ROOF DRAINAGE (TYP.)

GRASS LINED V-DITCH (TYP.)

ROOF DRAINAGE INFILTRATION TRENCH / 25 L.F. EACH HOUSE (TYP.)

STORMWATER INTERCEPTOR - SILT TRAP

18"Ø CULVERT

RELIEF LINE (TYP.)

(2) PARALLEL 3-FT DEEP INFILTRATOR TRENCH, 540 L.F. TOTAL

DRAINAGE SEDIMENTATION AREA

GRASS SWALE (TYP.)

3' DEEP INFILTRATION DRAINAGE TRENCHES (TYP.)

COMMODORE WEBSTER DRIVE

POINT REYES AFFORDABLE HOMES, INC.

POINT REYES AFFORDABLE HOUSING PROJECT
POINT REYES STATION, CALIFORNIA

QUESTA Civil Engineering Water Resources

Mod	Rev	Date	By	Description	Appr'd
C-1A	1	11-13-00	LJ	Revised drainage to Tomales Creek via lower backfield area	N.H.
C-1A	2	1-24-01	LJ	Revised drainage to reflect modifications during design by others	N.H.

Design N.H.
Drawn L.J.
Checked N.H.
Approv'd N.H.

STORMWATER TREATMENT & DISPOSAL
SITE PLAN
POINT REYES AFFORDABLE HOUSING
POINT REYES STATION, CA

Size D | Drwg No. 201.26.01 | Rev. 2
Scale 1" = 30'
Date 1-24-2001

PC ATTACHMENT #17

EXHIBIT NO. 5
APPLICATION NO. A-2-MAR-02-009
POINT REYES AFFORDABLE HOUSING INC.

"EXHIBIT 3"

CONDITIONS OF APPROVAL

Point Reyes Affordable Homes, Inc. Countywide Plan Amendment, Community Plan Amendment, Local Coastal Program Amendment, Rezoning, Coastal Permit, Master Plan, Precise Development Plan, and Subdivision

Marin County Community Development Agency – Planning Division

GENERAL

1. The Point Reyes Affordable Homes, Inc. Countywide Plan Amendment, Community Plan Amendment, Local Coastal Program Amendment, Rezoning, Coastal Permit, Master Plan, Precise Development Plan, and Subdivision is conditionally approved for the development of a mixed-density residential project with visitor-serving and conservation uses on property located at **857 Mesa Road, Point Reyes Station**, on **Assessor's Parcels 119-240-45, -46, -57, and –58.**

   A. The Marin Countywide Plan Community Development Policy CD-15.18 is hereby amended to incorporate a Coastal, Multiple Family (C-MF-2), one to four units per acre land use designation. Community Development Map 7.9 for Point Reyes Station is hereby amended as follows: (1) the land area encompassed by the Williams Street Apartments, Papermill Creek Apartments, and Papermill Creek Homes shall be designated with a Coastal, Multiple Family (C-MF-2), one to four units per acre land use designation; (2) the land area designated for open space conservation shall be designated with a Coastal, Open Space (C-OS) land use designation.

   B. The corresponding Point Reyes Station Community Plan's Land Use Policy Map (Map 7.9 of Appendix M) is hereby amended to incorporate a Coastal, Multiple Family (C-MF-2), one to four units per acre land use designation over the land area encompassed by the Williams Street Apartments, Papermill Creek Apartments, and Papermill Creek Homes and to incorporate a Coastal, Open Space (C-OS) land use designation over the land area designated for open space conservation. The Zoning Map contained in Appendix A is amended to incorporate the following new zoning designations: (1) a Coastal, Residential Multiple Planned (C-RMP-3.2), 3.2 units per acre maximum density zoning district shall govern the land area designated for the Williams Street Apartments; (2) a Coastal, Residential Multiple Planned (C-RMP-4.3), 4.3 units per acre maximum density zoning district shall govern the land area designated for the Papermill Creek Apartments and Homes; (3) a Coastal, Residential Multiple Planned Commercial (C-RMPC) zoning district shall govern the land area designated for future development of a public parking lot, restrooms, and visitor-serving lodge uses; and (4) a Coastal, Open Area (C-OA) zoning district shall govern the land area designated for open space conservation.

   C. The Local Coastal Program Unit II is amended to incorporate the following new policy 8(b) to New Development and Land Use Policy:

   Development of the 18.59-acre property consisting of Assessor's Parcels 119-240-45, -46, -57, and –58 and consisting of Areas A, B, C, D, E and F as depicted on Exhibit E, shall be subject to the following land use designations, as defined in the Marin Countywide Plan and further incorporated as Appendix G to the Local Coastal Program: The land use designation for Areas A and B shall be C-MF-2 (Coastal, Multiple-family, one to four units per acre maximum residential density). The land use designation for Area C shall be C-SF-4 (Coastal, Single-family Residential, one to two units per acre). The land use designation for Areas D and E shall be C-RS

(Coastal, Residential Commercial, one to 20 units per acre maximum residential density, 30% to 50% commercial floor area ratio). The land use designation for Area F shall be C-OS (Coastal, Open Space).

The site shall be subject to an overall single site development plan for the entire 18.59-acre area that consists of Areas A, B, C, D, E, and F. The site development plan shall be subject to the review and approval of the California Coastal Commission as an amendment to the LCP. Any coastal development permit or permits for development of any portion of the site shall be consistent with the approved site development plan. The site development plan shall indicate the kinds, locations, and intensities of uses allowable in accordance with the following requirements.

1. The total number of residential units on the entire 18.6-acre area shall not exceed 36.
2. Area A shall be developed with a maximum of seven detached affordable for-sale units ranging in size from approximately 900 to 1,155 square feet.
3. Area B shall be developed with a maximum of 27 rental affordable units ranging in size from approximately 1,440 to 1,720 square feet, with a manager's unit/community building of approximately 2,180 square feet.
4. No more than two residential dwelling units may be developed within Area C.
5. A minimum of 12 public parking spaces shall be provided within Area D.
6. A minimum of two acres shall be reserved for a future overnight visitor-serving facility, preferably providing lower cost services to the maximum extent feasible, <u>or an alternative commercial use deemed appropriate by the Coastal Commission</u> within Area E.
7. Future use of the approximate 18.59-acre area depicted on Exhibit E, including all wetlands shall be consistent with the Local Coastal Program, including provisions which mandate a 100-foot minimum buffer as measured landward from the edge of the wetlands.
8. No coastal development permit for a subdivision or division of the approximate 18.59-acre area depicted on Exhibit E shall be approved without the owner(s) of all such assessor parcels agreeing to grant or offer to dedicate a conservation easement over all wetland and wetland buffer areas prior to issuance of any coastal development permit for subdivision or division of the 18.59 acre area depicted on Exhibit E.

A Rezoning of the affected areas from the existing Coastal, Village Commercial Residential (C-VCR:B-2) and Coastal, Suburban Agricultural (C-RA:B-3) zoning districts to a Coastal, Residential Multiple Planned Commercial (C-RMPC) and Coastal, Residential Multiple Planned zoning districts would be considered as part of the LCP Amendment through the Zoning Implementation Plan, and further depicted as Exhibit "D."

D. The Marin County Code Title 22 (Zoning) is hereby amended by rezoning Assessor's Parcels 119-240-45, -46, -57, and –58 as follows: (1) a Coastal, Residential Multiple Planned (C-RMP-3.2), 3.2 units per acre maximum density zoning district shall govern the land area designated for the Williams Street Apartments; (2) a Coastal, Residential Multiple Planned (C-RMP-4.3), 4.3 units per acre maximum density zoning district shall govern the land area designated for the Papermill Creek Apartments and Homes ; (3) a Coastal, Residential Multiple Planned Commercial (C-RMPC) zoning district shall govern the land area designated for future development of a public parking lot, restrooms, and visitor-serving lodge uses; and (4) a Coastal, Open Area (C-OA) zoning district shall govern the land area designated for open space conservation.

E. Pursuant to Marin County Code Chapters 22.45, 22.56, and 20.32, the Point Reyes Affordable Homes Master Plan, Precise Development Plan, Coastal Permit, and Subdivision applications are approved for the following: (1) the construction of 27 affordable rental apartments and 7

affordable for-sale single-family residences; (2) the reservation of land area for future development of a three-bedroom, up to 2,800 square foot market rate single-family residence, a one-bedroom, up to 750 square foot cottage, and a barn; (3) the reservation of land area for future development of a 20-room, up to 17,000 square foot lodge or a similar visitor-serving use; (4) the reservation of land area for future development of a 12-space public parking lot and a restroom structure; and (5) the reservation of land for open space conservation purposes. A Subdivision (Vesting Tentative Map) to divide the property into 13 separate lots of record is conditionally approved. Any modifications to the project that would eliminate the affordable component shall require an amendment to the Master Plan.

2. Except as modified herein, plans submitted for approval of a Final Map, Improvement Plans, Building Permits, and Grading Permits shall be in substantial conformance with plans identified as "Exhibit A," on file in the Community Development Agency, and consisting of the following:

   A. Site and landscape plans consisting of three sheets, entitled "Point Reyes Affordable Housing," prepared by Donald L. Blayney and Associates, Landscape Architect, and dated January 25, 2002;

   B. Architectural plans consisting of three sheets, entitled "Point Reyes Affordable Housing," prepared by Chris Lamen and Associates, Architecture and Planning and Richard H. Olmsted, AIA, Architecture and Planning, Inc., and dated January 2002;

   C. Vesting Tentative Map and engineering plans consisting of three sheets, entitled "Point Reyes Affordable Housing, prepared by Euphrat Engineering, and dated January 2002; and

   D. Stormwater and wastewater treatment plans, consisting of two sheets, entitled "Point Reyes Affordable Housing Project," prepared by Questa Engineering Corp., and dated January 17, 2002 and January 25, 2002.

   In the event a conflict exists between plans, the dimensions and specifications from the Vesting Tentative Map and engineering plans shall govern. Minor modifications to the development plans may be approved administratively by the Community Development Director provided the modifications are consistent with the Master Plan and the intent and objectives of the original condition. The building heights for the Papermill Creek Apartment Type 4 and the Papermill Creek Homes Type 6 may be increased to 26 feet, at the discretion of the Community Development Director, in order to allow a variety of building heights in the development.

3. Exterior building materials for the Williams Street Apartments, Papermill Creek Apartments, and Papermill Creek Homes shall be in substantial conformance with the color and materials boards on file in the Community Development Agency, entitled "Point Reyes Affordable Housing," identified as Exhibits "C-1", "C-2", and "C-3" and dated January 23, 2002. All exterior flashing, sheet metal, or metal work shall utilize an appropriately subdued, non-reflective color.

   The use of photovoltaic (PV) or solar energy systems is permitted for the development, subject to review and approval by the Community Development Director in consultation with the Point Reyes Village Association, provided the following standards are met: (1) the system shall be flushmounted to the roof of the building; and (2) the color of the PV modules shall be dark, consistent with the approved roofing material.

4. The Master Plan shall remain valid and shall run in perpetuity with the subject property. The Precise Development Plan for the Williams Street Apartments, Papermill Creek Apartments, and Papermill

Creek Homes includes Design Review approval for the improvements. The Precise Development Plan and Coastal Permit shall be vested through securing a valid Building Permit and/or other permits related to the approval and substantially completing the improvements in accordance with the secured Building Permit and/or other permits within two (2) years from the date of approval. Upon written request by the applicant and payment of appropriate fees at least 60 days prior to expiration of the initial approval, the Precise Development Plan and Coastal Permit may be extended for a maximum period of four years pursuant to Sections 22.45.063 and 22.56.120 of the Marin County Code if the application is consistent with the Master Plan, the Marin Countywide Plan, the Point Reyes Station Community Plan, and the Local Coastal Program. CONCURRENT WITH THE RECORDATION OF EACH FINAL MAP, the applicant shall record a deed disclosure, against the title to each of the lots contained in that Final Map, which identifies the land use restrictions and conditions required herein for purposes of disclosure.

5. Future development and use of all portions of the property shall be subject to the following restrictions and conditions:

   A. A conservation easement shall apply to all delineated wetlands and a buffer area extending 100 feet from the edge of the wetlands as depicted in the Final Map. Only the water pipeline extension approved herein and uses that are allowed by the Local Coastal Program are permitted within the easement. Fences and other structures shall be prohibited within the conservation easement area. Animal grazing, filling, or other site alterations are prohibited within the easement area. Vegetation shall not be removed, unless for purposes of eradicating non-native, invasive species, to comply with local and State fire safety regulations, to prevent the spread of disease as required by the State Food and Agriculture Department, or to prevent safety hazards to people and property. It shall be the responsibility of the property owner to eradicate non-native, invasive species within the easement area.

   B. Except for the solid board fencing located within the Bostick Avenue private road easement, no fencing is proposed or approved as part of this project. Future construction of fencing should be minimized to allow movement of wildlife and access to light and views. Fencing shall utilize a wire mesh or similar open-type design. Except for solid enclosures (such as around trash storage areas and propane tanks) and privacy fencing between the side yards for the Papermill Creek Homes, solid board fencing shall not be utilized, unless a finding is made that a solid fence is necessary for safety or for community compatibility purposes. Privacy between properties shall be provided primarily by landscaping.

   C. Landscaping, low height fencing, boulders, and/or signs shall be utilized to discourage vehicular access into or parking over the septic leachfields associated with the Williams Street Apartments, Papermill Creek Apartments, and the future public restrooms and visitor-serving commercial use.

   D. Construction management offices are permitted on the project site subject to review and approval by the Community Development Director.

6. Future development and use of the seven lots that comprise the Papermill Creek Homes shall be subject to the following restrictions and conditions:

   A. Horses, donkeys, mules, and similar livestock animals are not permitted to be kept on any portion of the property.
   B. The area south of Papermill Creek Road shall be kept open and undeveloped.

C. Landscaping shall be consistent with the Point Reyes Station Landscaping Guide. Large trees that are not suitable for built-up areas shall be prohibited.

D. Use of a temporary office for the sale of the properties may be allowed for maximum period of one year from the issuance of the first building permit for the Papermill Creek Homes or the close of escrow on the last home, whichever occurs first, subject to review and approval by the Community Development Director and findings that the location of the office would not result in a detriment to the surrounding properties and roadways. The office shall be removed no later than 30 days from the expiration date above. At the discretion of the Community Development Director, an extension to the time limits established in this condition may be granted administratively for due cause.

7. Future development of the market-rate residential lot on Lot 9 of the Point Reyes Affordable Homes Subdivision shall require Design Review and Coastal Permit approval pursuant to Sections 22.82.020 and 22.56.055 of the Marin County Code. If a food preparation or kitchen facility is proposed within the one-bedroom cottage on this lot, a Second Unit Use Permit shall be required pursuant to Section 22.98.090 of the Marin County Code. The following restrictions and conditions shall apply to future development of this property.

   A. Any intensification of the residential density on this lot beyond two dwelling units shall require an amendment to the Point Reyes Affordable Homes Master Plan, pursuant to Section 22.45.050(B) of the Marin County Code, and an amendment to the Local Coastal Program, Unit II Recreation and Visitor Serving Policy 8(b) and Zoning Implementation Plan.

8. Future development of the public parking lot, restrooms, and the visitor-serving commercial use on Lots 10 and 12 of the Point Reyes Affordable Homes Subdivision shall require Precise Development Plan and Coastal Permit approval pursuant to Sections 22.45.050(B) and 22.56.055 of the Marin County Code.

9. Future development of the public parking lot and restroom structure on Lot 12 shall incorporate the following conditions and restrictions:

   A. The location, size, and access for the parking lot and restroom structure shall be in general conformance with those which were conceptually depicted on Exhibit "A."
   B. The parking lot and restroom structure shall be screened from public views with shrubs consistent with the Point Reyes Station Landscaping Guide.
   C. The width of the driveway entrance shall be minimized to the extent necessary for safety purposes.

10. Future development and use of the visitor-serving commercial use on Lot 10 shall be subject to the following conditions and restrictions:

   A. The following development criteria shall govern the design and layout of the future improvements:

      1) Vehicular access shall be provided off Papermill Creek Road, to the extent feasible;
      2) The improvements shall be designed and sited to minimize impacts to the modified historical grid in the downtown village area;
      3) Structures shall be sited toward the easterly portion of the lot, to the extent feasible, in order to create a more compact development cluster in conjunction with the Papermill Creek Apartments

4) The improvements shall be designed and sited to preserve the open character over the westerly portion of the site to the extent feasible.

B. The use shall consist of the overnight lodge use approved by the Master Plan, or a similar visitor-serving use consistent with the intent and objectives of the Countywide Plan's Coastal Recreation Corridor and the Local Coastal Program and the parameters evaluated in the Environmental Impact Report for the Point Reyes Affordable Homes project.

C. Development of the visitor-serving commercial use on this property shall not occur sooner than two years following completion of the last residential unit in the affordable housing component of this project, or January 1, 2006, whichever occurs later. As defined herein, development consists of the issuance of construction permits from the County of Marin, including, but not limited to, a Building Permit or a Grading Permit.

11. Future use of Lot 13 which comprises the wetland resources shall be subject to the following conditions and restrictions:

A. Prior to the initiation of permitted agricultural uses under the Coastal, Open Area zoning, an agricultural and natural resources management plan shall be submitted and reviewed by the Community Development Director, in consultation with the Agricultural Advisory Committee.

B. The opportunity for permanent public access on this lot shall be provided to the extent that it is consistent with the purpose of the agricultural and natural resources management plan.

C. PRIOR TO APPROVAL OF THE SUBDIVISION IMPROVEMENT AGREEMENT OR ISSUANCE OF A GRADING PERMIT, the applicant shall demonstrate that a plan for the long-term protection of the wetlands has been submitted and found acceptable by the Regional Board Executive Officer for the Regional Water Quality Control Board. This plan should include measures to preclude adverse impacts to the wetlands that may be associated with occupancy and use of the proposed development, monitoring the conditions of the wetlands, and contingency measures to be taken in the event that the wetlands are adversely impacted in the future.

SUBDIVISION

12. The Vesting Tentative Map shall expire according to the provisions of the Subdivision Map Act and any amendments thereto and applicable provisions of the Marin County Code consistent with the Subdivision Map Act. The Vesting Tentative Map can and likely will employ multiple (phased) Final Maps which shall be prepared in accordance with state and local laws. Because Lots 9, 10, and 13 are designated for development and/or uses that would occur in the near future, the County recognizes that all applicable conditions of approval, except those dictating the form of the Final Maps, have been satisfied regarding the Final Maps creating Lots 9, 10, and 13. The County shall determine which conditions must be satisfied before subsequent Final Maps (other than those Final Maps creating Lots 9, 10, and 13) are approved. Pursuant to the Subdivision Map Act, each filing of a Final Map shall extend the expiration of the remaining Vesting Tentative Map by 36 months (or such other time as may be later provided by the Subdivision Map Act, as amended) from the date of its expiration, or from the date of the previously filed Final Map, whichever is later; however, the multiple Final Maps shall not extend the Vesting Tentative Map more than 10 years. In addition to the foregoing, the applicant may seek extensions of the Vesting Tentative Map pursuant to other provisions of the Subdivision Map Act.

13. The vested rights conferred by this approval to any portion of the project shall last for the collective total of (1) the life of the Vesting Tentative Map given by the Subdivision Map Act; (2) the life given the vested rights by the Subdivision Map Act to the particular Final Map related to such portion; (3) the life of the building permits and their extension related to construction to such portion; and (4) any other extension provided by state or local law. Pursuant to Government Code section 66498.1, if during the life of the Vesting Tentative Map, applicant requests an extension of time allowed by the Subdivision Map Act, the County shall grant the extension without condition except those conditions allowed by Government Code section 66498.1(c).

14. The phasing of the project is not affected by the Lot designations on the Vesting Tentative Map. Lot numbers were assigned for convenience only, not for their sequence of development.

15. ~~12.~~ Each Final Map to record the Subdivision (Vesting Tentative Map) approved herein shall be recorded with the County Recorder. Each such Final Map must be in substantial conformance with the relevant portion of Exhibit "A" including lot lines, building envelopes, easements, and development standards **EXCEPT** for the following modifications:

A. Former Lot 13 of the Vesting Tentative Map shall be deleted..

B. A new, modified Lot 13 shall be depicted on the Vesting Tentative Map to incorporate the wetland areas delineated within the central and easterly portions of the property, generally following the lot configuration and lot lines depicted manually on an attachment to Exhibit "A" which is entitled, "Marin County Planning Commission's Recommended Plan, (February 11, 2002)." A permanent public access easement to this lot shall be provided, through a combination of floating or defined access easements through Lots 10, 11, and/or 12. To facilitate provision of potential access to West Marin School in the future, a similar floating easement shall be provided over the westerly "flagged" portion of Lot 9. The proposed access easement along the northeasterly property line of Lot 9 shall be extended to encompass Lots 6 and 7.

C. The southerly lot line for Lot 10 shall extend to the center line of Papermill Creek Road. The portion of Lot 10 south of the center line and extending to the common property line with the United States Coast Guard's Commodore Webster Drive, shall be made part of Lot 8 which encompasses the Papermill Creek Apartments.

D. The Final Map shall identify a conservation easement over the three wetlands and the buffer areas extending outward for 100 feet from the exterior edge of the wetlands.

E. The Final Map shall depict an access easement within the Papermill Creek right-of-way to connect with the 6-foot pedestrian access easement located over Lots 6 and 7.

F. The Final Map shall accurately depict the Bostick Avenue private road easement.

16. ~~13.~~ PRIOR TO RECORDATION OF THE INITIAL FINAL MAP, the applicant shall submit a copy of a conforming Vesting Tentative Map for review and approval by the Community Development Agency. The Vesting Tentative Map shall incorporate the modifications required in the preceding condition of approval.

17. ~~14.~~ Pursuant to California Government Code Section 66474.9(b), the County of Marin shall require that the subdivider defend, indemnify, and hold harmless the County or its agents, officers, and employees from any claim, action, or proceeding against the County or its agents, officers, and employees to attack, set aside, void, or annul, this approval by the County, which action is brought

within the time period provided for in California Government Code Section 66499.37. The County shall promptly notify the subdivider of any claim, action, or proceeding and the County shall cooperate fully in the defense. If the County fails to promptly notify the subdivider of any claim, action, or proceeding, or if the County fails to cooperate fully in the defense, the subdivider shall not thereafter be responsible to defend, indemnify, or hold harmless the County.

18. ~~15.~~ Improvements required by Title 20 (Subdivision), Title 24 (Development Standards), and any improvements shown on, or required as a condition of approval (including site grading, drainage, utilities, and common access roadway improvements) shall be constructed. Prior to commencement of any construction work, and prior to filing of each Final Map for the residential or visitor-serving commercial uses, the applicant or owner shall submit to the Marin County Department of Public Works, Land Use and Water Resources Division, an Improvement Plan as specified in Title 24. The required subdivision improvements must be completed before the Final Map is filed or before occupancy of any structure within the approved lots if the applicant or owner is able to enter into an Improvement Agreement with the Department of Public Works. Such Agreement would be secured by a good and sufficient improvement security in an amount adequate to cover the estimated cost of improvements.

19. ~~16.~~ Construction of the water line extension shall be restricted to the dry season (April 15 to October 15). PRIOR TO APPROVAL OF THE IMPROVEMENT PLANS OR ISSUANCE OF A GRADING PERMIT, whichever occurs first, the applicant shall submit a monitoring plan, prepared by a qualified wetland biologist, which specifies measures to be undertaken during construction to minimize construction impacts.

20. ~~17.~~ The following restrictions and conditions shall be stated or shown on an addendum page to the Final Map to be filed for record:

A. A conservation easement shall apply to all delineated wetlands and a buffer area extending 100 feet from the edge of the wetlands as depicted in the Final Map for Lot 13. Only the water pipeline extension approved herein and uses that are allowed by the Local Coastal Program are permitted within the easement. Fences and other structures shall be prohibited within the conservation easement area. Animal grazing, filling, or other site alterations are prohibited within the easement area. Vegetation shall not be removed, unless for purposes of eradicating non-native, invasive species, to comply with local and State fire safety regulations, to prevent the spread of disease as required by the State Food and Agriculture Department, or to prevent safety hazards to people and property. It shall be the responsibility of the property owner to eradicate non-native, invasive species within the easement area.

B. Except for Lot 9, further subdivision of any parcel or lot within the subdivision shall not be permitted.

21. ~~18.~~ PRIOR TO RECORDATION OF EACH FINAL MAP, the Final Map must be submitted to the County Surveyor for review and approval. The Final Map data and form must be in compliance with provisions of Chapters 20.36 and 20.40 of the Marin County Code. All building envelopes, approved as shown on the Vesting Tentative Map, shall be designated on an addendum page to the Final Map.

22. ~~19.~~ PRIOR TO RECORDATION OF THE FINAL MAP FOR LOT 13, APPROVAL OF THE SUBDIVISION IMPROVEMENT AGREEMENT, OR ISSUANCE OF A GRADING PERMIT, whichever occurs first, the applicant shall demonstrate that wetland compensation at a ratio of 3:1 shall be provided on-site to compensate for disturbance within the 100-foot wetland buffer area related to the undergrounding of the water line extension. The applicant shall submit a plan, prepared

by a qualified wetland biologist, which includes recommendations for wetland enhancement measures that provide equivalent levels of function and values as those which have been impacted by the construction within the wetland buffer area. This condition would not apply if the water line extension were relocated to avoid encroachment into the wetland buffer area. PRIOR TO FINAL INSPECTIONS OF THE SUBDIVISION IMPROVEMENTS, the applicant shall demonstrate that all measures identified in the approved wetland enhancement plan have been completed to provide adequate compensation for wetland buffer area disturbances, and that a monitoring plan has been implemented to ensure the long-term success of these measures.

23. ~~20.~~ PRIOR TO RECORDATION OF THE FINAL MAPS FOR THE RESIDENTIAL OR VISITOR-SERVING USES, APPROVAL OF THE SUBDIVISION IMPROVEMENT AGREEMENT, OR ISSUANCE OF A GRADING PERMIT, whichever occurs first, the following items shall be submitted to the Planning Division:

A. A letter of confirmation from the North Marin Water District which confirms that all required legal, financial, and construction agreements have been applied for and completed to provide water extension facilities to the approved lots;

B. A letter of confirmation from the local provider of electricity (PG&E), which confirms that all required legal, financial, easements, contracts, and construction agreements have been applied for and completed to provide service to the approved lots;

C. A letter from the North Marin Water District which acknowledges receipt of written confirmation from the agencies with regulatory oversight over the District's water supply wells that all precautionary measures have been incorporated into the design of the project's wastewater systems to minimize potential contamination of the Water District's wells; and

D. A letter from the Environmental Health Services Division which confirms that sufficient information has been provided by the project engineer to support the methodology and assumptions that form the bases for the design of the wastewater and stormwater systems and which confirms that the design would adequately address the following concerns: (1) adequacy of the design to adequately handle wastewater and stormwater runoff; (2) the adequacy of the hydrogeologic investigation to address concerns relating to viral contamination of Lagunitas Creek; (3) the potential for nitrate contamination of Lagunitas Creek; and (4) the adequacy of the site to accept post-development stormwater run-off. This letter should include written documentation of compliance with County regulations by the Environmental Health Services Division for on-site wastewater systems for all components and aspects of the designs. The compliance letter shall be submitted to the Regional Water Quality Control Board for review and approval by the Regional Board Executive Officer.

24. ~~21.~~ CONCURRENT WITH THE RECORDATION OF EACH FINAL MAP, the following shall be recorded: (1) all conditions of project approval contained herein; (2) a conservation easement which encumbers Lot 13 and all wetland buffer areas extending 100 feet from the perimeter of the delineated wetlands; and (3) the hold harmless agreement. All documents shall be in a form approved by the County Counsel, and shall comply with the Subdivision Map Act.

25. ~~22.~~ PRIOR TO APPROVAL OF THE SUBDIVISION IMPROVEMENT AGREEMENT OR ISSUANCE OF A GRADING PERMIT, whichever occurs first, the applicant shall submit plans for installation of all stormwater treatment and disposal improvements that are shown on Sheet C-1A of "Exhibit A." The applicant shall also demonstrate that an Operation, Maintenance, and Monitoring Plan for the stormwater systems, has been submitted and found acceptable by the Regional Board

Executive Officer for the Regional Water Quality Control Board. This Plan should include identification of which entity will be responsible for maintaining the stormwater systems, and the means to assure that necessary funding to conduct operation, maintenance, and monitoring activities are in place.

26. ~~23.~~ PRIOR TO APPROVAL OF THE SUBDIVISION IMPROVEMENT AGREEMENT OR ISSUANCE OF A GRADING PERMIT, whichever occurs first, the applicant shall submit construction plans depicting the installation of a solid 6-foot high privacy fence within the Bostick Avenue private road easement, as depicted on Exhibit "A" and the removal of the 20-inch Monterey pine tree located within the Mesa Road right-of-way. (Completion of the improvement required in this condition shall serve to demonstrate compliance with Mitigation 4.7-4 of the project's Environmental Impact Report, as referenced in Condition of Approval 77.)

27. ~~24.~~ PRIOR TO FINAL INSPECTIONS OF THE SUBDIVISION IMPROVEMENTS, a licensed arborist shall submit a letter report evaluating the effectiveness of all tree preservation measures and providing additional recommendations to ensure the long-term health and well-being of the Cypress trees located on either side at the commencement of Papermill Creek Road.

28. ~~25.~~ Unless a public emergency services provider recommends otherwise or unique circumstances necessitate a change, street addresses for the approved lots shall be as follows. This approval does not necessarily establish the final street names. Following consultation with the Point Reyes Station Village Association to receive input, the final street names may be submitted as part of the Final Map for this subdivision.

Lot #	Street Address
1	21 Papermill Creek Road
2	23 Papermill Creek Road
3	25 Papermill Creek Road
4	27 Papermill Creek Road
5	29 Papermill Creek Road
6	31 Papermill Creek Road
7	33 Papermill Creek Road
8	5 Papermill Creek Road
9	27 Bostick Avenue
10	1 Papermill Creek Road
11	3 Bostick Avenue
12	1 Bostick Avenue

DEVELOPMENT

29. ~~26.~~ PRIOR TO ISSUANCE OF A DEMOLITION PERMIT, the applicant shall prepare and submit a Health and Safety Plan for review and approval by the Bay Area Air Quality Management District ("BAAQMD"). This plan shall be prepared in accordance with California Occupational Safety and Health Agency requirements and shall contain the means and methods for controlling and monitoring airborne asbestos.

30. ~~27.~~ PRIOR TO ISSUANCE OF A BUILDING PERMIT, the applicant shall revise the site plan or other first sheet of the office and job site copies of the Building Permit plans to list these Conditions of Approval as notes.

31. ~~28.~~ PRIOR TO ISSUANCE OF A BUILDING PERMIT, the applicant shall revise the plans to depict the location and type of all exterior lighting for review and approval of the Community Development Director. Exterior lighting shall be permitted for safety purposes only, must consist of low wattage fixtures, and must be directed downward and hooded. A cut (specification) sheet depicting all exterior lights shall be included on the Building Permit plans.

32. ~~29.~~ PRIOR TO ISSUANCE OF A BUILDING PERMIT, the applicant shall submit details for all proposed site improvements for the review and approval by the Community Development Director in consultation with the Point Reyes Village Association. The plans shall specify the location and design, if applicable, of all trash enclosures, mailboxes, play area improvements, signage, propane tanks, and fencing.

33. ~~30.~~ PRIOR TO ISSUANCE OF A BUILDING PERMIT, the applicant shall submit a construction management and phasing plan for review and approval by the Community Development Director in consultation with the Department of Public Works. The plan shall designate the areas for construction staging activities, including the areas for parking of construction vehicles. The applicant shall be responsible for ensuring that all construction vehicles, equipment and materials are stored on site and off the street so that pedestrian and vehicles can pass safely at all times. The applicant shall be responsible for ensuring that the number of construction vehicles shall be limited to the minimum number necessary to complete the project.

34. ~~31.~~ PRIOR TO ISSUANCE OF A BUILDING PERMIT, the applicant shall submit a "Statement of Conformance" prepared by a certified or licensed landscape design professional which confirms that the approved landscaping plan conforms to the design requirements contained in Chapter 23.10 (Water Efficiency in Landscaping) of the Marin County Code. Alternatively, the applicant may satisfy this requirement by submitting a letter from the North Marin Water District confirming project compliance with the district's landscape water efficiency regulations. This requirement is not applicable if the applicant demonstrates that all project landscaping would be irrigated exclusively with reclaimed water or with private well water.

35. ~~32.~~ PRIOR TO ISSUANCE OF A BUILDING PERMIT, the applicant shall submit a revised final landscape plan for review and approval by the Community Development Director, in consultation with the Point Reyes Village Association which incorporates the following modifications to Exhibit "A":

A. The palette of broadleaf and conifer trees shall be deleted and replaced with suitable tree species from the Point Reyes Village Landscaping Guide.
B. The trees depicted in the easterly rear yards of Lots 6 and 7 of the Papermill Creek Homes shall be deleted. Smaller, native landscape specimens, consistent with the Point Reyes Station Landscaping Guide, may be planted for privacy screening purposes.

36. ~~33.~~ PRIOR TO ISSUANCE OF A GRADING PERMIT OR BUILDING PERMIT, whichever occurs first, the applicant shall submit a tree protection plan for the review and approval of the Community Development Director. The plan shall be prepared by a certified arborist and shall include the requirements contained in this condition. The plan shall specify the installation of temporary fencing around the outer dripline of all trees which are located adjacent to the approved improvements. The fencing shall remain until all construction, including utilities, are completed. No construction activity (including grading, access, materials storage, and soil stockpiling) shall occur within the dripline of all protected trees. If utility lines must be located within the dripline, the trenches must be cut by hand and all roots one inch or greater in diameter must be protected and if necessary, sawn but not torn or ripped. If construction access, storage or stockpiling must be located within the dripline, then

at least a 6-inch mulch layer must first be installed. At the end of construction, the area shall be aerated and the tree fertilized. Any tree accidentally damaged during construction shall be inspected and treated by an arborist. In the event the tree is removed or permanently damaged, it shall be replaced with similar tree species on a two to one basis, unless express approval to waive replacement is granted by the Community Development Director.

37. PRIOR TO ISSUANCE OF A BUILDING PERMIT for the Williams Street Apartments or the Papermill Creek Apartments, the applicant shall submit a Below Market Rate Agreement for review and approval by the Community Development Director. The agreement shall be consistent with Section 22.97.050 of the Marin County Code and controlling state law. The agreement shall acknowledge that the project would consist of inclusionary rental units to be occupied by, and affordable to, very low and low income residents for a specified period of at least 55 years. The agreement shall also contain initial and periodic monitoring provisions to verify compliance with the terms of the agreement.

38. PRIOR TO ISSUANCE OF A BUILDING PERMIT for the Papermill Creek Homes, the applicant shall submit a Below Market Rate Agreement for review and approval by the Community Development Director. The agreement shall be consistent with Section 22.97.070 of the Marin County Code and applicable law. The agreement shall acknowledge that the project would consist of inclusionary for-sale units to be sold to residents of very low, low, or moderate income. The agreement shall also contain initial and periodic monitoring provisions to verify compliance with the terms of the agreement.

39. ~~36.~~ The only trees approved for removal are those depicted on Exhibit "A," including the 20-inch Monterey pine tree located within the Mesa Road right-of-way within the sight distance for Bostick Avenue. No other existing trees on the subject property shall be removed except to comply with local and State fire safety regulations, to prevent the spread of disease as required by the State Food and Agriculture Department, and to reasonably prevent safety hazards to people and property.

40. ~~37.~~ PRIOR TO OCCUPANCY, the applicant shall submit a "Statement of Completion," signed by a certified or licensed landscape design professional, which confirms that the approved landscaping was installed as designed, or written proof from the North Marin Water District that the installed landscaping has been planted in conformance with the plans approved by the district. This requirement is not applicable if the applicant demonstrates that all project landscaping would be irrigated exclusively with reclaimed water or with private well water.

41. ~~38.~~ PRIOR TO OCCUPANCY for the Williams Street Apartments, Papermill Creek Apartments, and Papermill Creek Homes, the applicant shall install all proposed and required landscaping. All soils disturbed by development of the project shall be reseeded with native grasses or wildflowers to control erosion. The applicant shall call for a Community Development Agency staff inspection of the landscaping and irrigation at least five working days before the anticipated completion of the project. Failure to pass inspection will result in withholding of the final inspections and imposition of hourly fees for subsequent reinspections.

42. ~~39.~~ PRIOR TO OCCUPANCY for the Williams Street Apartments and the Papermill Creek Apartments, the applicant or owner shall submit a maintenance performance agreement to the Community Development Director for review and approval. The agreement shall be secured by a performance bond in the amount of one and one-half times the value of all landscaping to ensure the proper maintenance, care, and establishment of the landscaping for a period of two years following the grant of occupancy for the last building. Any dead landscaping or landscaping in a state of

permanent decline shall be replaced at the end of the two-year maintenance period to the satisfaction of the Community Development Director.

43. ~~40.~~ PRIOR TO OCCUPANCY OF THE LAST AFFORDABLE RESIDENTIAL UNIT, the applicant shall demonstrate that the existing corral and fencing on the property have been removed, and that the existing driveway has been restored and reseeded to reflect a natural condition.

44. ~~41.~~ Any changes or additions to the project shall be submitted to the Community Development Agency for review and approval before the contemplated modifications may be initiated.

Marin County Department of Public Works

45. ~~42.~~ PRIOR TO APPROVAL OF A SUBDIVISION IMPROVEMENT AGREEMENT OR ISSUANCE OF A GRADING PERMIT, whichever occurs first, the applicant shall comply with the following condition. The applicant shall submit improvement plans as specified in Marin County Code Title 24, which shall provide for the required roadways, drainage improvements, traffic improvements, and other relevant improvements. The applicant shall make all arrangements required by the County to ensure that these improvements are completed in conjunction with the proposed development.

46. ~~43.~~ PRIOR TO APPROVAL OF A SUBDIVISION IMPROVEMENT AGREEMENT OR ISSUANCE OF A GRADING PERMIT, whichever occurs first, the applicant shall comply with the following condition. To reduce offsite flood-related impacts to the maximum extent practicable, the capacity of the proposed retention facilities shall be sized such that the project results in no increase in post-development runoff volumes beyond existing runoff volumes from a 100-year, 24-hour storm event. This event represents the largest design event (by volume) commonly used as an industry standard. The following requirements shall be satisfied:

A. Installation and operation of the drainage system shall be such that the site drainage during construction shall result in no increase in post-development runoff volumes beyond existing runoff volumes from a 100-year, 24-hour storm event.

B. The drainage and infrastructure design capacity of the proposed retention and infiltration facilities shall accommodate any existing runoff from the West Marin School property.

C. The drainage and infrastructure design shall be sized to accommodate runoff from paved roads, and future development on the commercial parcel and the public parking parcel.

D. The applicant shall provide supporting hydrology and hydraulic calculations, references, model studies, reports, or other information necessary to confirm the project's drainage design.

~~44.~~47. PRIOR TO APPROVAL OF A SUBDIVISION IMPROVEMENT AGREEMENT OR ISSUANCE OF A GRADING PERMIT, whichever occurs first, the applicant shall comply with the following condition. The project shall have an erosion and sediment control plan which addresses both interim (during construction) and final (post construction) control measures. The specific control measures to be utilized shall be subject to the review and approval of the Department of Public Works and shall be in general accordance with the current "Manual of Standards for Erosion and Sediment Control Measures" published by the Association of Bay Area Governments. The plan shall be implemented by October 15th or earlier if so required by the Department of Public Works. The applicant shall demonstrate that a Notice of Intent to Comply with the statewide NPDES General

Permit for Storm Water Discharges Associated with Construction Activity has been filed. The following requirements shall be met.

A. All disturbed surfaces including but not limited to cut and fill slopes, building pads, driveways and areas cleared of vegetation shall be protected against erosion by measures approved by the Department of Public Works that are appropriate to the site, phase of construction and time of year.

B. Grading operations shall not be conducted during the rainy season (October 15th through April 15th) without prior approval from the Department of Public Works. Such approval shall only be given upon clear demonstration, to the satisfaction of the Department of Public Works, that at no stage of the work will there be any substantial risk of increased sediment discharge from the site. When grading operations are permitted during the rainy season, a phasing plan and work schedule shall be required to insure that the smallest practicable area of erodible land is exposed at any one time and the time of exposure is minimized. The phasing plan and work schedule must be approved by the Department of Public Works prior to the start of grading or prior to October 1st at the discretion of the Department of Public Works. A cash bond in an amount approved by Department of Public Works may be required to insure that control measures are implemented and maintained.

48. ~~45.~~ PRIOR TO APPROVAL OF A SUBDIVISION IMPROVEMENT AGREEMENT OR ISSUANCE OF A GRADING PERMIT, whichever occurs first, the applicant shall submit plans that demonstrate compliance with the following requirements:

A. The applicant shall submit for review and approval by the County a design-level geotechnical investigation. Plan review and construction observation/testing is required by the project geotechnical engineer. The final design of the proposed improvements shall incorporate the results of the geotechnical investigation approved by the County.

B. All private streets shall be improved to a 20-foot minimum width and be contained within the roadway easement.

C. All roadways and parking lots shall be paved. Permeable pavements may be allowed, subject to review and approval by the Department of Public Works.

D. The plans shall include roadway profiles and cross-sections.

E. The plans shall indicate the building pad rough grade elevations.

F. Details for both proposed intersections with Mesa Road shall be provided. These include all proposed improvements, edge of pavement for both sides of street, any driveways in the vicinity of both proposed intersections, and an analysis of sight distance. The project shall comply with all approved mitigations.

G. Parking spaces shall be dimensioned on the plans. The plans shall include the handicap parking spaces and the parallel spaces on Papermill Creek Road.

H. Handicap parking shall comply with the California State regulations for disabled access.

I. The applicant shall indicate on the plans the minimum horizontal setback distance along the property boundaries, structures and septic systems, and vertical setback from ground water, for the infiltration trenches, as approved by the Department of Public Works.

J. The plans shall include an easement connecting a future walkway from the public parking lot parcel to Mesa Road.

49. ~~46.~~ PLANS SUBMITTED FOR FUTURE CONSTRUCTION of the public parking lot and restroom lot shall provide for a future walkway from the parking lot to Mesa Road.

50. ~~47.~~ PRIOR TO APPROVAL OF A SUBDIVISION IMPROVEMENT AGREEMENT OR ISSUANCE OF A GRADING PERMIT, whichever occurs first, the applicant shall submit documentation from the Fire Marshal approving the roadway/driveway widths and turnarounds.

51. ~~48.~~ PRIOR TO RECORDATION OF ANY FINAL MAP OR ISSUANCE OF A GRADING PERMIT, whichever occurs first, the applicant shall submit a conforming tentative map for review by the Department of Public Works and the Community Development Agency which indicates conformance with all conditions of project approval. The tentative map shall include the following:

A. Drainage facilities, including but not limited to, infiltration trenches, sedimentation basins, and conduits, serving multiple parcels shall have drainage and drainage access easements. Sufficient easements shall be required for underground conduits, infiltration trenches, for disposal of surface and storm waters, together with sufficient easements for overflow and ponding, and vehicle access necessary to provide for proper operation and maintenance of drainage facilities. All such easements shall comply with Marin County Title 24 and shall be of sufficient width for the purposes intended, as approved by the Public Works.

B. Ownership and easement boundaries shall be shown for the Bostick Avenue private road easement. The applicant shall provide documentation supporting the boundary determination.

52. ~~49.~~ PRIOR TO RECORDATION OF EACH FINAL MAP, the applicant shall submit a maintenance agreement(s) which provides for the ability of the drainage and roadway improvements to be maintained by the associated parcels. The agreement shall be submitted to the Department of Public Works for review and approval and shall be recorded concurrently with the Final Map.

53. ~~50.~~ PRIOR TO RECORDATION OF EACH FINAL MAP, the applicant shall enter into an Improvement Agreement for those required improvements that are not constructed prior to recordation of the map.

54. ~~51.~~ PRIOR TO ISSUANCE OF A BUIDLING PERMIT, the Building Permit plans shall be reviewed and approved by a Registered Soils Engineer. Certification shall be either by stamp and original signature on the plans, or by a stamped and signed letter.

55. ~~52.~~ All work within the County right-of-way shall require an Encroachment Permit from the Department of Public Works.

56. ~~53.~~ PRIOR TO FINAL INSPECTION OF THE SUBDIVISION IMPROVEMENTS OR GRADING PERMIT, whichever occurs first, the applicant shall conduct a flow verification test of the infiltration trenches, and the engineer shall certify to the Department of Public Works that the infiltration trenches were installed in substantial conformance to the plans and are operational.

Marin County Community Development Agency - Environmental Health Services

57.~~54.~~ PRIOR TO ISSUANCE OF A BUILDING PERMIT, the applicant shall obtain the necessary construction permits for the septic systems and comply with all permitting conditions related to the permits. The permit approvals include either a renewable operating permit issued by Environmental Health Services, or Waste Discharge Requirements or waiver thereof issued by the Regional Water Quality Control Board.

~~55.~~58. In addition to standard requirements for routine inspection and maintenance, AN Operation, Maintenance, and Monitoring Program and Contingency Plan~~a monitoring and contingency plan~~ shall be required for the project. The plan shall include provisions for water quality monitoring, repair/replacement of malfunctioning equipment, and other remedial measures to handle unexpected problems with the septic leachfields and to prevent contamination of groundwater sources. The plan should include a complete description of all equipment and components of the system, a description of how the system and relevant individual components are intended to work, and all activities needed or recommended in order to ensure proper system performance. The plan should identify procedures for conducting monitoring of ground water quality upslope, within, and downslope of the project site, and other ambient conditions (e.g. rainfall and groundwater levels) in order to demonstrate compliance with original wastewater system design criteria. The contingency component of the plan should include actions to be taken in the event of malfunctioning equipment or system, of unexpected problems, or that the system does not comply with design criteria or ambient condition criteria. The plan should identify the responsible party for the system, how identified plan actions will be implemented, and how identified contingency actions will be funded. The plan shall be submitted for review and approval by the Community Development Director and the Regional Board Executive Officer for the Regional Water Quality Control Board, in consultation with the North Marin Water District, PRIOR TO RECORDATION OF THE FINAL MAP.

~~56.~~59. In order to enhance the operation of the septic system and minimize costs for maintenance and repair, the use of kitchen sink garbage disposal units is discouraged in the Papermill Creek Homes, Papermill Creek Apartments, and the Williams Street Apartments. The applicant shall include this restriction as part of the disclosure documents to potential buyers and renters of the homes. PRIOR TO FINAL INSPECTION OF EACH SEPTIC SYSTEM, the Environmental Health Services staff shall conduct an inspection to verify that the kitchens are not equipped with kitchen sink garbage disposal units.

60. When the septic system for the future visitor-serving commercial parcel is designed, it shall be designed to comply with Environmental Health Services regulations.

Marin County Fire Department

61.~~58.~~ PRIOR TO ISSUANCE OF A GRADING OR BUILDING PERMIT, whichever occurs first, the applicant shall submit written verification from the Fire Marshal that the project complies with all requirements for fire safety, including provision of adequate water for fire protection, road access, and vegetation management.

~~59.~~62. PRIOR TO FRAMING INSPECTIONS, the applicant shall submit written verification from the Fire Marshal that adequate fire protection arrangements have been completed for this stage of the development.

63. ~~60.~~ PRIOR TO OCCUPANCY, the applicant shall submit written verification from the Fire Marshal that all fire protection requirements have been completed.

North Marin Water District

64.~~61.~~ The applicant shall enter into a water service facilities agreement with the District, make all necessary financial arrangements (including payment of connection fees) and construct all necessary off tract and on tract facilities to serve the project.

~~62.~~65. The project shall comply with North Marin Water District's water conservation Regulation 17. This regulation includes requirements for low flow interior plumbing fixtures, installation of laundry facility washing machines that are Energy Star Rated and restrictions on turf irrigation.

California Department of Transportation

~~63.~~66. An Encroachment Permit is required for any work or traffic control measures proposed within the State right-of-way at Highway One.

Project Environmental Impact Report Mitigations

The following conditions of approval, numbers 64 through 88, have been derived from mitigations contained in the Environmental Impact Report for the project. All stages of project development shall conform with the adopted Mitigation, Monitoring and Reporting Program, and the County of Marin will verify compliance with each of the required mitigations. The detailed reporting checklist in a table format reflects the specific monitoring, implementation, and timing provision of the Environmental Impact Report mitigation measures and shall serve the purpose of verifying project compliance with the required conditions of approval. Unless otherwise provided, the applicant may implement conditions of approval for a specific geographic area only when improvements are to be constructed or developed in that area. The source of each condition is provided as a bracketed reference at the end of each condition. For example, (Geology #1.1-1) refers to geology mitigation measure 1.1-1 from the EIR.

67. ~~64.~~ PRIOR TO ISSUANCE OF A BUILDING PERMIT, the proposed landscaping plan shall be modified such that no trees or other vegetation are planted in a manner that would block views or sunlight from adjoining properties. *(Plan Policy, #4.2-2)*

68. ~~65.~~ PRIOR TO ISSUANCE OF A BUILDING PERMIT, the applicant shall submit plans demonstrating that all utility distribution lines within the project site, including the proposed road rights-of-way, shall be placed underground. *(Plan Policy #4.2-3)*

69. ~~66.~~ PRIOR TO RECORDATION OF THE FINAL MAP FOR LOT 9, ISSUANCE OF A GRADING PERMIT, OR ISSUANCE OF A BUILDING PERMIT, whichever occurs first, the project sponsor shall execute a covenant, subject to review and approval by Marin County, prohibiting further subdivision of the market rate farm parcel created by the proposed project beyond the subdivision necessary for the creation of the two lots for the market-rate housing units. *(Plan Policy #4.2-5)*

70.~~67.~~ PRIOR TO ISSUANCE OF A CONSTRUCTION PERMIT FOR THE SEWAGE DISPOSAL SYSTEM, and in order to comply with county standards for septic tank design, a two-inch vent on the baffle wall of all septic tanks shall be constructed by the applicant. *(Wastewater Treatment #4.4-2 and #4.5-14)*

71.~~68.~~ PRIOR TO ISSUANCE OF A CONSTRUCTION PERMIT FOR THE SEWAGE DISPOSAL SYSTEM, the dosing chambers and overflow tanks for the pressurized systems shall be sized to

accommodate the peak day wastewater generation volume for the corresponding land use to ensure compliance with County standards. *(Wastewater Treatment #4.4-3 and #4.5-14)*
In addition:

A. High water alarms shall be installed in all wastewater pumping systems, in accordance with County standards, to alert the operator or maintenance staff of a high level in the pump tank;

B. All pumping systems shall include provisions for extended operation during general power outages using a portable emergency generator; and

C. Scheduled and emergency maintenance of pressurized systems shall be performed by a licensed septic system, pump, or plumbing contractor, septic system pumping service, or other qualified maintenance person as identified in an Operating Permit, if issued for the system by the County.

72.~~69.~~ PRIOR TO ISSUANCE OF A CONSTRUCTION PERMIT FOR THE SEWAGE DISPOSAL SYSTEM, and to comply with county standards for septic tank design, the project shall include septic tank capacity sufficient to provide 2 days of detention volume for all parcels. *(Wastewater Treatment, #4.4-4 and #4.5-14)*

73.~~70.~~ There are two methods available to ensure compliance with MCEHS sizing standards for the public restroom septic tank and leach field. PRIOR TO ISSUANCE OF A CONSTRUCTION PERMIT FOR THE SEWAGE DISPOSAL SYSTEM, the project proponent shall design the project's wastewater treatment system for the public restrooms according to one of the following. *(Wastewater Treatment, #4.4-5, #4.5-9, and #4.5-14)*

A. Ultra low flush urinals and very low flow toilets that generate an average of 2 gpd/person or less shall be used for the public restrooms.

B. Low flow fixtures that generate an average of 3.5 gpd/person or less shall be used, a 2,500-gallon septic tank shall be installed, and a 5,040 square-foot leachfield shall be constructed for the public restrooms. The project sponsor shall provide documentation to MCEHS sufficient to demonstrate compliance with MCEHS standards for leachfield sizing.

74.~~71.~~ PRIOR TO APPROVAL OF THE SUBDIVISION IMPROVEMENT AGREEMENT OR ISSUANCE OF A GRADING PERMIT, whichever occurs first, the applicant shall comply with the following condition. To reduce offsite flood-related impacts and to maintain the design capacity of the infiltration trenches to the maximum extent practicable, the following mitigation measures shall be implemented. *(Hydrology, #4.5-2 and #4.5-14)*

A. To accommodate surface runoff from the West Marin School, the capacity of the proposed retention facilities shall be increased to accommodate any school runoff.

B. To promote a long design life of the infiltration trenches, surface runoff shall be filtered prior to reaching the infiltration trenches to reduce contaminants and sediment that could clog the trench media. Filtering devices may include, but not be limited to, biofilter strips and vegetated channels. These features shall be subject to review and approval by Marin County prior to implementation.

C. During construction, the following measures shall be taken to provide additional protection against the failure of the infiltration trenches:

1. Adequate protection from siltation of the trench drains shall be provided during construction through the use of best management practices (BMP).

2. Exposed soils shall be revegetated as soon as possible to prevent erosion.

3. Excavated surfaces shall be scarified to promote percolation upslope of the trenches.

4. The drain rock shall be washed prior to installation into the excavations.

5. To prevent surrounding soils from migrating into the trenches, the excavation shall be lined with a permeable filter fabric or a similar filtering device.

6. Inspection wells shall be constructed to allow monitoring of the performance of the trenches.

75.~~72.~~ PRIOR TO APPROVAL OF THE SUBDIVISION IMPROVEMENT AGREMENT OR ISSUANCE OF A GRADING PERMIT, whichever occurs first, the applicant shall comply with the following condition. In accordance with Marin County Code Chapters 23.08 and 24.04, the project sponsor shall implement erosion and sedimentation Best Management Practices to protect the water quality of Lagunitas Creek and local groundwater. Best Management Practices (BMPs), designed to protect stormwater quality, are summarized in the *California Storm Water Best Management Practice Handbooks* (Stormwater Quality Task Force 1993) and can be recommended by the Association of Bay Area Governments *Manual of Standards for Erosion and Sediment Control Measures.* BMPs are subject to review and approval by Marin County Department of Public Works shall be implemented during project construction. According to Marin County Code Section 24.04.625, grading shall not be conducted during the rainy season (October 15 through April 15) without prior approval by Marin County Department of Public Works. *(Hydrology, #4.5-4, #4.5-12, and #4.5-14)*

The following measures shall be implemented in accordance with the LCP:

A. Sediment basins (including debris basins, desilting basins, or silt traps) shall be installed on the project site in conjunction with initial grading operations and maintained through the development process to remove sediment from runoff waters. All sediment shall be retained on site unless removed to an appropriate dumping location.

B. Temporary vegetation, seeding, mulching, or other suitable stabilization methods shall be used to protect soils exposed during grading. Cut and fill slopes shall be stabilized immediately with approved landscape vegetation.

C. All topsoil removed by grading operations shall be stockpiled for reuse onsite and shall be protected from compaction, wind, and erosion during stockpiling.

76.~~73.~~ PRIOR TO ISSUANCE OF A BUILDING PERMIT, the applicant shall implement the following mitigation measures to reduce Impact 4.6-2 (Earthquake Ground Shaking) to a less-than-significant level. *(Geology, #4.6-2)*

A. The applicant shall secure a California-Certified Engineering Geologist and Civil Engineer to provide the Project Structural Engineer with seismic design criteria and recommendations (examples below) based on State and County regulations for development in areas exposed to moderate to severe earthquakes. The site-specific recommendations made by the California-Certified Engineering Geologist and Civil Engineer shall be approved by the County of Marin Building Inspection Division prior to implementation at the site.

As an overall performance criterion, seismic design features will be adequate to ensure that the proposed structures withstand the maximum credible earthquake for the San Andreas and Hayward faults. Examples of the seismic design criteria to be provided to the Project Structural Engineer include: (i) identification of the controlling fault for seismic engineering design; (ii) design earthquake magnitude; (iii) distance to energy source (earthquake); (iv) likely duration of strong ground shaking and qualitative discussion of its intensity and frequency (e.g., high vs. low); and (v) discussion of the potential for amplified ground shaking due to local geologic conditions. The specific structural features appropriate for the project would be determined based on the seismic engineering design process.

B. The applicant shall use appropriate grading and design, in accordance with the UBC and Marin County Code requirements, to reduce the secondary effects of ground shaking on manmade improvements.

C. Fill used during the construction of the project shall be properly designed with subsurface drainage and adequately compacted (i.e., minimum of 90% relative compaction as defined by the American Society for Testing and Materials (ASTM D1557) to significantly reduce fill settlement.

~~74.~~77. PRIOR TO ISSUANCE OF ANY GRADING OR CONSTRUCTION PERMITS, the applicant shall submit for review and approval by the County a design-level geotechnical investigation. Plan review and construction observation/testing is required by the project geotechnical engineer. Final design of the proposed improvements shall incorporate the results of the geotechnical investigation approved by Marin County. *(Geology, #4.6-2)*

78.~~75.~~ PRIOR TO ISSUANCE OF A BUILDING PERMIT, the applicant shall comply with the following condition. As a part of a design-level geotechnical report, specific recommendations for mitigation of expansive soils under pavements and structures shall be provided, if moderate or highly expansive soils are found to be present within the development area. Typical mitigation measures include special pavement and foundation design and/or subexcavation of expansive soils. Geotechnical and foundation design features to avoid the potential for expansive soil damage shall be implemented, as approved by the County of Marin Building Inspection Division. *(Geology, #4.6-8)*

79.~~76.~~ Construction shall only occur during daylight hours to eliminate the need for nighttime construction lighting. *(Visual Resources, #4.7-2)*

80.~~77.~~ PRIOR TO ISSUANCE OF A BUILDING PERMIT, the project proponent shall implement at least one of the following measures to reduce headlight glare onto adjacent residences from vehicles within the project site. *(Visual Resources, #4.7-4)*

A. The landscape plan shall include sufficient shrubbery along the western site boundary and along the western side of the Bostick Avenue private road easement to screen headlight glare from within the project site

B. Fencing shall be installed along the western site boundary and along the western side of the Bostick Avenue private road easement to screen headlight glare from within the project site. The fencing shall be between 4 and 6 feet in height. Final fencing design shall be approved by the Marin County Community Development Agency prior to construction.

81.~~78.~~ PRIOR TO APPROVAL OF A PRECISE DEVELOPMENT PLAN for the visitor serving commercial lot, the applicant shall demonstrate conformance with the following condition. Any future project proposed for the visitor serving commercial use shall include adequate parking spaces sufficient to ensure that offsite areas are not adversely affected. Implementation of this mitigation measure would reduce potentially significant impacts associated with parking for a future visitor serving commercial facility to a less-than-significant level. *(Transportation and Circulation, #4.8-4)*

82.~~79.~~ PRIOR TO ISSUANCE OF THE FIRST BUILDING PERMIT, a stop sign shall be erected at the Mesa Road/Papermill Creek Road intersection to stop northbound traffic. *(Transportation and Circulation, #4.8-8)*

83.~~80.~~ PRIOR TO APPROVAL OF A SUBDIVISION IMPROVEMENT AGREEMENT, ISSUANCE OF A GRADING PERMIT, OR ISSUANCE OF A BUILDING PERMIT, whichever occurs first, the applicant shall demonstrate conformance with the following condition. To minimize construction-related traffic impacts, a construction traffic management plan shall be prepared before the start of construction. *(Transportation and Circulation, #4.8-11)* The plan shall include the following elements:

A. The number of truck trips;

B. Time of day and location of street closures, if any;

C. Time of day arrival and departure of trucks;

D. Limitations on the size and type of trucks;

E. Provision of a truck staging area, with limitation on the number of trucks that can be waiting;

F. Provision of a truck circulation pattern;

G. Provision of driveway and side-street access plan along Shoreline Highway so that safe vehicular, pedestrian and bicycle movements are maintained (e.g., steel plates, minimum distances of open trenches, location of school bus and private vehicle pick up and drop off areas);

H. Maintenance of safe and efficient access routes for emergency vehicles;

I. Manual traffic control when necessary;

J. Proper advance warning and posted signage concerning street closures;

K. Notification of affected residences and businesses along Shoreline Highway;

L. Provisions for pedestrian safety; and

M. Maintenance of safe and accessible public transit stops.

With the construction management plan, residents and visitors would be expected to be able to cross streets safely and maneuver in and out of driveways with little or no difficulty. Implementation of the construction traffic management plan would also help facilitate safe access and egress along Shoreline Highway at all times during the construction phase.

For the West Main School, a safe "route-to-school" plan should be developed as part of the traffic management plan that includes the designated sidewalks, street crossings, location of crossing guards, location of any proposed signs, queuing areas, and times of day that the plan would be in effect. This safe "route-to-school" plan should include advanced warning signs along all approaches to the school site. An adult crossing guard should be provided at the designated crosswalks in the "route-to-school" plan.

84.~~81.~~ To reduce construction-related emissions, applicable BAAQMD Basic and Enhanced Control Measures controls shall be implemented at all construction sites. *(Air Quality, #4.9-1)* Specific controls to be implemented include the following:

A. Water all active construction areas at least twice daily;

B. Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard;

C. Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas and staging areas at construction sites;

D. Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites;

E. Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets;

F. Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more);

G. Enclose, cover, water twice daily or apply (non-toxic) soil binders to exposed stockpiles (dirt, sand, etc.);

H. Limit traffic speeds on unpaved roads to 15 mph.;

I. Install sandbags or other erosion control measures to prevent silt runoff to public roadways;

J. Replant vegetation in disturbed areas as quickly as possible;

K. Construction equipment shall be maintained in accordance with manufacturers' specifications; and.

L. To the extent feasible, construction equipment shall not be left idling for periods of more than 10 minutes.

To reduce potential farm-related increases in airborne concentrations of fugitive dust at nearby residential dwellings and the West Marin School, the following dust control measures shall be implemented:

Water at least twice a day all areas where soil disturbing activities (e.g., tilling of soil) is actively occurring: (1) enclose, cover, or water twice daily exposed stockpiles (earth, fertilizers, etc.); (2) limit vehicle speeds in unpaved areas to 15 mph; (3) plant crops or other vegetation in disturbed areas as quickly as possible; and (4) soil disturbing activities shall be suspended when wind speeds exceed 20 mph.

85.~~82.~~ Construction-generated noises shall be minimized through the following measures. *(Noise, #4.10-1)*

A. To reduce construction noise impacts, construction contractors shall be required to limit noise-generating demolition and construction activities to between the hours of 7:00 a.m. and 5:00 p.m., Monday through Friday, and between the hours of 9:00 a.m. and 4:00 p.m. on Saturday. Construction activities shall be prohibited on Sundays and holidays.

B. Equipment engine doors on motorized equipment shall be closed during equipment operation.

C. All construction equipment shall be equipped with mufflers.

D. When not in use, motorized construction equipment shall not be left idling.

E. Stationary noise-generating construction equipment (e.g., generators and compressors) shall be located at the greatest distance possible from nearby noise-sensitive land uses.

F. An acoustic barrier (e.g., lead curtains, wooden sound barriers) shall be constructed along the northwestern boundary of the project site (along the West Marin School property line) to reduce construction-generated noise levels associated with construction of the Williams Street Apartments. The barriers shall be designed to obstruct the line-of-sight between the nearest occupied buildings and onsite equipment. When installed properly, acoustic barriers can reduce construction noise levels by approximately 10 dBA (EPA 1971).

G. Prior to commencing construction, written notification containing (at a minimum) the following information shall be provided to West Marin School: (1) the location of proposed construction activities, including haul truck routes; (2) the hours and dates during which construction activities are anticipated to occur; (3) the name and telephone number of a designated onsite representative to be contacted for noise- or safety-related concerns or complaints.

86.~~83.~~ In the event that previously unknown archaeological resources are discovered during any land alterations activities, the construction crew shall immediately cease work in the discovery area (i.e., within 20 meters). A qualified archaeologist approved by Marin County Community Development Agency shall be consulted to evaluate the resource in accordance with state and federal guidelines. If prehistoric Native American remains are discovered, the State Native American Heritage Commission and affected Native American groups shall be notified in accordance with State regulations. Mitigation measures consistent with §21083.2 of CEQA shall be devised and a mitigation plan submitted for approval of the Community Development Agency. All archaeological excavation and monitoring activities shall be conducted in accordance with prevailing professional standards as outlined in § 21083.2 of CEQA. Mitigation, in accordance with a plan approved by the Marin County Community Development Agency, shall be implemented prior to commencement of work within the area of the resource find. *(Archaeological and Historic Resources, #4.12-1, #4.12-5)*

87.~~84.~~ PRIOR TO ISSUANCE OF A BUILDING PERMIT, the finish details and construction materials shall be approved by the Marin County Community Development Director in consultation with a qualified architectural historian. *(Archaeological and Historic Resources, #4.12-3)*

88.~~85.~~ PRIOR TO APPROVAL OF A PRECISE DEVELOPMENT PLAN for the future commercial use, the facility's design shall be:

A. Reviewed by a qualified architectural historian to determine whether the style, mass, scale, craftsmanship, and quality of building materials characteristic of Point Reyes Station Historic

Area would adversely affect the eligibility of the Historic Area as a National Register Historic District; and

B. Approved by the Marin County Community Development Director. *(Archaeological and Historic Resources, #4.12-4)*

89.~~86.~~ The following mitigation measures shall be implemented to ensure project impacts on raptors and other tree-nesting birds are reduced to a less-than-significant level. *(Biological Resources, #4.13-3 and #4.13-11)*

A. Tree removal shall be avoided during the nesting season (February 1 to August 31) to the extent possible. If tree removal is required during the nesting season, a focused survey shall be conducted by a qualified biologist to identify active nests in the trees to be removed.

B. If an active nest is found, the nest tree shall not be removed until after the young have fledged (as determined by a qualified biologist).

C. Prior to construction during the nesting season, a focused survey for raptor nests shall be conducted by a qualified biologist during the nesting season to identify active nests in and adjacent to the project site. The survey shall be conducted no less than 14 days and no more than 30 days prior to the beginning of construction or tree removal.

D. If nesting raptors are found during the focused survey, no construction shall occur within 400 feet of an active nest until the young have fledged (as determined by a qualified biologist).

90.~~87.~~ PRIOR TO ISSUANCE OF A GRADING PERMIT OR BUILDING PERMIT, whichever occurs first, and to avoid inadvertent impacts to seasonal wetlands during construction, temporary orange mesh fencing shall be placed around all seasonal wetlands at the site and all activities shall be restricted to the outside of these fences by appropriate signage. The fencing location shall be identified by a qualified wetland specialist. The fences shall remain in place for the entire construction period and shall be periodically checked to ensure that they remain intact. Fencing shall be removed following the completion of construction. *(Biological Resources, #4.13-9 and #4.13-11)*

~~88.~~91. PRIOR TO ISSUANCE OF A BUILDING PERMIT, the project proponent shall revise the landscaping plan, eliminating any species listed in the CalEPPC list (included in Appendix G of this report), and develop new plan in accordance with the Point Reyes Station Landscaping Guide (included in Appendix G). *(Biological Resources, #4.13-10 and #4.13-11)*

TATE OF CALIFORNIA —THE RESOURCES AGENCY GRAY DAVIS, Governor
CALIFORNIA COASTAL COMMISSION
ORTH CENTRAL COAST DISTRICT OFFICE
5 FREMONT, SUITE 2000
AN FRANCISCO, CA 94105-2219
15) 904-5260

COMMISSION NOTIFICATION OF APPEAL

DATE: April 11, 2002

TO: Tom Lai, Senior Planner
County of Marin, Community Development Agency
3501 Civic Center Drive, #308
San Rafael, CA 94903-4157

FROM: Sarah Borchelt, Coastal Program Analyst Sarah Borchelt

RE: **Commission Appeal No. A-2-MAR-02-009**

Please be advised that the coastal development permit decision described below has been appealed to the California Coastal Commission pursuant to Public Resources Code Section 30602 or 30625. Therefore, the decision has been stayed pending Commission action on the appeal pursuant to Public Resources Code Section 30623.

Local Permit #:	CP 00-28
Applicant(s):	Point Reyes Affordable Homes, Inc., Attn: Lamar Turner; Ecumenical Association For Housing
Description:	For the development of a 36-unit mixed-residential project on an 18.6 acre property and a barn.
Location:	857 Mesa Road, Point Reyes Station (Marin County) (APN(s) 119-240-45, 119-240-46, 119-240-57, 119-240-58)
Local Decision:	Approved w/ Conditions
Appellant(s):	Elena Belsky; Mark Warner; Tomales Bay Association
Date Appeal Filed:	4/11/2002

The Commission appeal number assigned to this appeal is A-2-MAR-02-009. The Commission hearing date has been tentatively set for May 7-10, 2002 in Santa Rosa. Within 5 working days of receipt of this Commission Notification of Appeal, copies of all relevant documents and materials used in the County of Marin's consideration of this coastal development permit must be delivered to the North Central Coast District office of the Coastal Commission (California Administrative Code Section 13112). Please include copies of plans, relevant photographs, staff reports and related documents, findings (if not already forwarded), all correspondence, and a list, with addresses, of all who provided verbal testimony.

A Commission staff report and notice of the hearing will be forwarded to you prior to the hearing. If you have any questions, please contact Sarah Borchelt at the North Central Coast District office.

EXHIBIT NO. 7
APPLICATION NO. A-2-MAR-02-009
POINT REYES AFFORDABLE HOUSING INC. (Page 1 of 52)

STATE OF CALIFORNIA—THE RESOURCES AGENCY

GRAY DAVIS, GOVERNOR

CALIFORNIA COASTAL COMMISSION

45 FREMONT, SUITE 2000
SAN FRANCISCO, CA 94105-2219
VOICE AND TDD (415) 904-5200
FAX (415) 904-5400

APPEAL FROM COASTAL PERMIT DECISION OF LOCAL GOVERNMENT

Please Review Attached Appeal Information Sheet Prior To Completing This Form.

SECTION I. Appellant(s)

Name, mailing address and telephone number of appellant(s):

Mark Warner/Elena Belsky/Tomales Bay Association
c/o John Sharp, Sharp & Brown, LLP
630 Las Gallinas Ave, Suite 310 (415) 507-1400
San Rafael, CA Zip 94903 Area Code Phone No.

SECTION II. Decision Being Appealed

1. Name of local/port government: Marin County Community Development Agency, Planning Commission and Board of Supervisors

2. Brief description of development being appealed: Point Reyes Affordable Homes Project
857 Mesa Road, Point Reyes Station
A.P. Nos. 119-240-45, 46, 57, 58

3. Development's location (street address, assessor's parcel no., cross street, etc.): 857 Mesa Road, Point Reyes Station
Marin County A.P. Nos. 119-240-45, 46, 57, 58

4. Description of decision being appealed:

a. Approval; no special conditions: _____

b. Approval with special conditions: X

c. Denial: _____

Note: For jurisdictions with a total LCP, denial decisions by a local government cannot be appealed unless the development is a major energy or public works project. Denial decisions by port governments are not appealable.

TO BE COMPLETED BY COMMISSION:

APPEAL NO: A-2-SMC-02-009

DATE FILED: April 11, 2002

DISTRICT: NCC

H5: 4/88

RECEIVED
APR 11 2002
CALIFORNIA COASTAL COMMISSION

5. Decision being appealed was made by (check one):

a. __Planning Director/Zoning Administrator

b. X City Council/Board of Supervisors

c. __Planning Commission

d. __Other_____

6. Date of local government's decision: March 19, 2002

7. Local government's file number (if any): NA

SECTION III. Identification of Other Interested Persons

Give the names and addresses of the following parties. (Use additional paper as necessary.)

a. Name and mailing address of permit applicant:
Ecumenical Association for Housing
2169 E. Francisco Blvd.
San Rafael, CA 94901

b. Names and mailing addresses as available of those who testified (either verbally or in writing) at the city/county/port hearing(s). Include other parties which you know to be interested and should receive notice of this appeal.

(1) Point Reyes Village Association Design Review Committee
P.O. Box 476
Point Reyes Station, CA 94956

(2) Environmental Action Committee of West Marin
11201 State Route No. 1
Point Reyes Station, CA 94956

(3) Salmon Protection Watershed Network
P.O. Box 400
Forest Knolls, CA 94933

(4) California Regional Water Quality Control Board
Attn: Blair Allen, Senior Wastewater Engineer
1515 Clay St., Suite 1400, Oakland, CA 94612

SECTION IV. Reasons Supporting This Appeal

Note: Appeals of local government coastal permit decisions are limited by a variety of factors and requirements of the Coastal Act. Please review the appeal information sheet for assistance in completing this section, which continues on the next page.

APPEAL FROM COASTAL PERMIT DECISION OF LOCAL GOVERNMENT (Page 3)

State briefly your reasons for this appeal. Include a summary description of Local Coastal Program, Land Use Plan, or Port Master Plan policies and requirements in which you believe the project is inconsistent and the reasons the decision warrants a new hearing. (Use additional paper as necessary.)

See attached.

Note: The above description need not be a complete or exhaustive statement of your reasons of appeal; however, there must be sufficient discussion for staff to determine that the appeal is allowed by law. The appellant, subsequent to filing the appeal, may submit additional information to the staff and/or Commission to support the appeal request.

SECTION V. Certification

The information and facts stated above are correct to the best of my/our knowledge.

Sharp & Brown, LLP
John E. Sharp

Signature of Appellant(s) or Authorized Agent

Date April 11, 2002

NOTE: If signed by agent, appellant(s) must also sign below.

Section VI. Agent Authorization

I/We hereby authorize _____ to act as my/our representative and to bind me/us in all matters concerning this appeal.

See attached following page.

Signature of Appellant(s)

Date _____

SECTION V. Certification

The information and facts stated above are correct to the best of my/our knowledge.

_____
Signature of Appellant(s) or Authorized Agent

Date _____

NOTE: If signed by agent, appellant(s) must also sign below.

SECTION VI. Agent Authorization

I/We hereby authorize John Sharp, Sharp & Brown, LLP to act as my/our representative and to bind me/us in all matters concerning this appeal.

Elena Belsky
_____ Date 4/11/02
Signature of Appellant(s)

_____ Date 4/11/02
Signature of Appellant(s)

Kenneth J. Fox
_____ Date 4/11/02
[*President, on behalf of Tomales Bay Association*]
Signature of Appellant(s)

Point Reyes Affordable Homes Project ("Project") - Appeal from Coastal Permit Decision of Local Government

Local Coastal Program

The Local Coastal Program applicable to this project is codified at Marin County Code Section 22.56 et seq. and states in part, "[T]he purpose of this chapter is to provide the mechanisms to implement coastal policies for Marin County. This chapter implements policies which identify the location and density of development...protect significant natural resources...and provide standards for public and private actions." Section 22.56.130 Development requirements standards and conditions, more particularly sets forth standards for A. Water Supply, B. Septic System Standards, C. Grading and Excavation, and G. Stream and Wetland Resource Protection. These sections, without limitation, apply to the Project and form the basis for this appeal.

Basis for the Appeal

Appellants' opposition to the Project, as approved, is based on the following issues: 1) the conditions related to wastewater/storm water management are not supported by substantial evidence; 2) the proposed septic system(s) for the project have not been adequately addressed. The ultimate beneficiaries of the proposed affordable housing, as well as members of the general public, will be exposed to the risks associated with waste water and storm water run-off.

During hearings at the County level, Appellants' consultants, Fall Creek Engineering ("FCE"), a professional environmental engineering firm, conducted site visits, reviewed and analyzed data prepared by the project proponent, its consultants, the various County departments and consultants to the County. FCE, as more particularly set forth in reports dated January 28, 2002, February 10, 2002 and March 18, 2002, attached hereto as **Exhibits A, B and C**, respectively, and incorporated herein by reference, identified the following unresolved issues, with particular regard to waste water/storm water management, and unmitigated impacts:

1. The findings and conditions purportedly supporting and allowing approval of the Project do not demonstrate that there is sufficient "storage capacity" in the unsaturated soils (vadose zone) to accept additional wastewater and storm water applied to the property, and to prevent untreated or partially treated sewage effluent from surfacing during average and wet water year conditions.

2. The findings and conditions purportedly supporting and allowing approval of the Project do not demonstrate that the hydrologic investigation adequately assesses the potential water quality impacts to the North Marin Water District water supply wells and Lagunitas Creek.

3. The findings and conditions purportedly supporting and allowing approval of the Project do not demonstrate that onsite and cumulative impacts to groundwater and surface water quality from additional nitrates from the proposed wastewater systems have been adequately addressed.

4. The findings and conditions purportedly supporting and allowing approval of the Project do not demonstrate cumulative impacts to surface water from potential impacts from plan storm water runoff and erosion have been adequately addressed.

The resolutions adopted by the County of Marin approving the Project incorporated Exhibits 2 and 3 (Findings and Conditions, respectively), several of which purported to address issues of wastewater/storm water management based, in turn, upon the environmental documents (draft EIR, Final EIR and EIR addendum) prepared in conjunction with the Project. As demonstrated in the FCE reports, insufficient information has been developed to allow the purported Findings to be made, or to demonstrate that the purported Conditions of Approval will be effective to carry out the mandates of Marin County Code Section 22.56 et seq., with particular regard to water supply, septic systems standards, grading and excavation and stream and wetland resource protection.

The California Regional Water Quality Control Board ("CRWQCB") also identified numerous "unresolved uncertainties including potential inadequate protection of beneficial uses of waters of the State."

CRWQCB as identified the following principal issues:

1. Storm Water Control Practices During Construction
2. Wetlands Disturbance and Mitigation
3. Long-term Protection of Existing On-Site Wetlands
4. Storm Water System Operation and Maintenance
5. Wastewater System Design and Adequacy
6. Wastewater Systems Permitting

All of these concerns are discussed in detail in the March 18, 2002 letter from the CRWQCB, attached hereto as **Exhibit D**, and incorporated herein by reference.

Although CRWQCB's letter resulted in revisions to the County's Conditions of Approval, there remains insufficient evidence to establish that the referenced uncertainties will be resolved.

Appellants appeal the March 19, 2002 decision of the Marin County Board of Supervisors (the "Board"). The Project does not conform to Marin County's certified Local Coastal Program related to, without limitation, health and safety and natural resource preservation policies, in particular, septic systems, storm water and wastewater runoff and waterway preservation. The Board's approval was based on findings of the Marin County Planning Staff Report (the "Staff Report"). However the findings in the Staff Report are contradicted by the findings of Fall Creek Engineering. Fall Creek's opinion is based on site visits and test analyses. The Project will violate the Local Coastal Program requirements all as set forth in the reports of Fall Creek Engineering. The concerns of Fall Creek Engineering are also found in the March 18, 2002 letter from the CRWQCB, along with numerous other related and unresolved concerns of the CRWQCB.

Appellants reserve the right to submit further documentation in support of this appeal, up to and including at the time of hearing on this appeal.

FALL CREEK ENGINEERING, INC.
Civil • Environmental • Water Resource Engineering and Sciences

Tel. (831) 426-9054 P.O. Box 7894, Santa Cruz, CA 95061 Fax. (831) 426-4932

January 28, 2002

Elena Belsky
P.O. Box 377
San Geronimo, CA

John Sharp
Sharp & Brown, LLP
630 Las Gallinas Avenue, Suite 310
San Rafael, CA 94903

Subject: **Technical Review – Final Environmental Impact Report**
Point Reyes Affordable Housing Project SCH# 2000052112

Dear Elena and John:

Pursuant to your request, Fall Creek Engineering, Inc. (FCE) has reviewed the proposed Mitigated Alternative Option 2 presented in the Final Environmental Impact Report (FEIR) for the above referenced project. The purpose of the review was to evaluate the adequacy of the FEIR and supplemental technical information to address and mitigate potential water quality and hydrology impacts.

The proposed project involves the conversion of 19.3 acres of grazed pasture to residential/commercial development. The project would result in the construction of 36 housing units in Point Reyes Station: 7 single family homes, 27 apartments, a farm property (to include a three-bedroom home and single bedroom cottage), and a future visitor service use (such as a 20 guest room bed-and-breakfast inn).

The proposed project would subdivide the property into twelve separate parcels. Eleven of the parcels would be served by conventional septic systems. The proposed farm parcel would utilize an alternative system, including a mound system. Increased stormwater runoff from the developed areas of the property will be directed to infiltration trenches or the existing wetland areas on the property.

The principal issues FCE has identified include:

1. The FEIR does not demonstrate that there sufficient "storage capacity" in the unsaturated soils (vadose zone) to accept additional wastewater and stormwater applied to the property, and to prevent untreated or partially treated sewage effluent from surfacing during average and wet water year conditions.

2. The FEIR hydrogeologic investigation does not adequately assess the potential water quality impacts to the North Marin Water District water supply wells and Lagunitas Creek.

EXHIBIT A

3. The FEIR does not adequately address onsite and cumulative impacts to groundwater and surface water quality from additional nitrates from the proposed wastewater systems.

4. The FEIR does not adequately address cumulative impacts to surface water from potential impacts from plan stormwater runoff and erosion.

Onsite Disposal of Wastewater and Stormwater Runoff

A primary concern is that the unsaturated or vadose zone will not have sufficient capacity to store additional water and prevent untreated or partially treated effluent from surfacing. The FEIR and supplemental information does not provide a thorough hydrologic analysis of existing and future conditions at the site to determine if the additional wastewater and stormwater will be contained on site. The drainage calculations performed by Questa Engineering, Inc. only assess drainage conditions related to short-duration design storm events only (such as the 100-year 24-hour design storm), and do not account for seasonal hydrologic changes. An annual water balance for the site under pre- and post-development conditions should be performed using average and wet water year rainfall data to assure that the proposed wastewater and stormwater systems will not cause the groundwater to surface at or downgradient of the site. A groundwater mounding analysis should also be performed in accordance with the Marin County Environmental Health Service guidelines to predict the highest rise of the water table. This analysis should include background groundwater conditions during the wet weather season.

From December 10, 1999 through October 7, 2000, Questa Engineering, Inc. monitored groundwater conditions at the property at several locations on nine separate occasions. In early March 2000, after approximately 37 inches of rainfall at Point Reyes had fallen over the season (average annual rainfall is approximately 39 inches), groundwater over the entire property rose approximately 7 feet. Groundwater levels in the vicinity of the proposed septic system leachfields and stormwater infiltrations systems that will serve the Papermill Creek Apartments and Houses rose within 3 to 6 feet of the ground surface. The proposed development plan for the Papermill Creek apartments and houses will add a significant volume of wastewater and stormwater to this area, which already experiences shallow groundwater conditions.

Under the proposed development plan FCE estimates the combined discharge of wastewater and stormwater will be approximately 8.74 ac-ft under a normal rainfall year or at least double the amount of water currently infiltrating to shallow groundwater. It is also important to note this additional discharge of water will not be applied over the entire 7.15 acres, but over a substantially smaller area of approximately 3.5 acres, and in the area that has the highest groundwater conditions observed on the property.

In the proposed infiltration areas, the groundwater was observed between 3 to 6 feet below ground surface. The porosity of the aquifer material was reported by Questa Engineering, Inc to be approximately 0.30, therefore the maximum water holding

capacity is approximately 0.30 acre-feet per foot depth of soil over an acre. If the depth to groundwater is 3 feet the effective storage volume for the 3.5 acres of land will be approximately 3.15 acre-feet of water (3.5 acres x 3 feet of unsaturated material x 0.30 acre-feet/feet-acre = 3.15 acre-feet). Similarly, if the depth of groundwater is 6 feet the effective storage volume will be approximately 6.3 acre-feet.

Based on these preliminary calculations, FCE concludes that the proposed project will significantly affect shallow groundwater hydrology at the site. Under average and wet rainfall years shallow groundwater could cause untreated or partially treated wastewater to surface at or downslope of the site, posing a significant threat to public health and the environment.

Hydrogeologic Investigation

Questa Engineering, Inc. performed a hydrogeologic investigation for the subject project to evaluate groundwater conditions at the site and to assess the potential impacts from the proposed project to water supply wells operated by the North Marin Water District. To assess groundwater flow patterns in the area between the Project site, Lagunitas Creek and the NMWD wells, Questa Engineering, Inc analyzed groundwater level data collect on September 26, 2000. Based on this limited data set, Questa developed a groundwater elevation contour map and delineated a "Zone of Contribution" for the NMWD wells. Based on this overly simplified analysis, Questa concluded that the Project site is not within the "Zone of Contribution" of the NMWD wells, and thus would not have an adverse impact on the NMWD wells. Further the "Zone of Contribution" analysis only considers pre-project conditions. The "Zone of Contribution" analysis also assumes that groundwater flow is under steady state conditions and as such does not consider seasonal variations in groundwater and stream flow and pumping rates, which affect the recharge and capture zone of the wells operated by the NMWD. The analysis does not include an analysis of post-project conditions, which in this case would assess groundwater flow under increase pumping and additional recharge areas.

Questa Engineering does not define nor provide the technical or theoretical basis (i.e. references) for this method of analysis. The analysis provided by Questa Engineering indicates that under pre-project conditions groundwater will travel to Lagunitas Creek in 1 year and to the NMWD wells in 2.5 years. These travel times are very fast for groundwater and suggest that any release of contaminants (most importantly nitrates and viruses) may pose a significant threat to groundwater quality. These travel times would probably shorten under post-project conditions from increased pumping and additional recharge sources.

FCE concludes that the groundwater modeling presented in the FEIR and the hydrogeologic investigation is inadequate to adequately assess potential impacts to the NMWD wells and Lagunitas Creek. Therefore, the FEIR findings of the effects on water quality of the NMWD wells to be "impacts less-than-significant" are not technically supported. FCE recommends that a transient mass transport model be used to analyze groundwater flow and transport of nitrate and other potential pollutants from the site to

the creek and NMWD wells under varying pumping regimes and groundwater levels for pre- and post-project conditions.

Cumulative Impacts to Groundwater and Surface Water Quality

The proposed project is within the Lagunitas Creek watershed, which is the main tributary stream to Tomales Bay. Throughout the FEIR and supporting technical information, the authors indicate or imply that the Lagunitas Creek is "relatively healthy" and that the proposed project will not have any cumulative impacts to groundwater or surface water quality. However, according the California Regional Water Quality Control Board, agricultural and urban runoff has impaired the water quality of Lagunitas Creek and Tomales Bay. The Creek and Bay have been placed on the California 303(d) list as water quality impaired water bodies for nutrients, pathogens and sedimentation/siltation. This listing in essence indicates that the level of nutrients, pathogens and sediment exceed the assimilative capacity of the stream and bay to receive additional sources of pollutants. However, the cumulative impact analysis presented in the FEIR and supplemental information does not address this existing condition. The proposed project will discharge nitrate-nitrogen to the shallow groundwater underlying the site, which discharges (potentially within 1 year) to Lagunitas Creek. However, the FEIR and supplemental information does not provided any assessment of the potential impacts to water quality in Lagunitas Creek.

FCE concludes that the FEIR is incomplete in its assessment of cumulative water quality impacts to surface and groundwater quality under pre- and post-project conditions. Therefore, the FEIR findings of the cumulative impacts to water quality on shallow groundwater and Lagunitas Creek to be less-than-significant are not technically supported. FCE recommends that a nitrate loading analysis be performed. The nitrate load analysis should be performed in accordance with guidelines established by the Marin County Environmental Health Service and be based on an annual chemical-water mass balance. The specific method shall be described and supported with accompanied technical references.

Stormwater Management

Under the proposed development plan (presented as Mitigated Alternative Option 2), stormwater runoff will be directed via grass lined swales from the Williams Street Apartments and the West Marin School to the open space and existing wetland areas on the west side of the property. However, the drainage study prepared by Questa Engineering does not analyze if this area has sufficient storage capacity to retain the additional runoff volume from these areas, therefore, the runoff analysis is incomplete.

As discussed above, the hydrologic analysis performed by Questa Engineering does not adequately assess the potential impacts from groundwater mounding at the site. FCE suspects that the proposed stormwater infiltration system will be hydraulically overloaded due to high groundwater conditions at the site. However, the drainage plans prepared by Questa Engineering do not assess the potential impacts to the existing off-site drainage infrastructure to accommodate pre- and post-project runoff. FCE recommends that the drainage analysis be expanded to assess the condition of the downstream drainage and to

recommend mitigation measures to prevent impacts (most notably erosion) from occurring if the onsite drainage systems are inadequate to contain runoff, as proposed.

The FEIR states that "the project site represents 0.04% of the Lagunitas Creek's 52,500-acre watershed. Increased runoff from the project site is a small enough portion of the overall watershed runoff that it is expected to have less-than-significant impacts on the hydrology of Lagunitas Creek." However, as noted above, according to the California Regional Water Quality Control Board, urban runoff and agriculture has impaired the water quality of Lagunitas Creek and Tomales Bay. The Creek and Bay have been placed on the California 303(d) list as water quality impaired water bodies for sedimentation/siltation. This listing indicates that the hydrology and water quality in Lagunitas Creek has been impacted by urban runoff and agricultural practices in the watershed. However, the FEIR does not assess pre- and post-project site-specific and cumulative impacts to the hydrology of Lagunitas Creek. FCE concludes that a more thorough analysis of the potential site-specific hydrologic impacts should be performed.

Lastly, on 20 December 2001, I conducted a site visit. Prior to and during the visit it was raining. During the visit I observed a substantial amount of standing water on the property and groundwater seepage occurring on the edge of the property and the embankment downslope of the property adjacent to Lagunitas Creek. These preliminary observations indicate that shallow groundwater conditions could be a significant problem or constraint at the site.

Based on our discussion with the RWQCB staff and other consultants working on adjoining properties, the occurrence of shallow groundwater conditions has caused septic system failures and prevented the use of onsite wastewater disposal systems, such as at the Coast Guard station property east of the site.

This concludes our analysis of the FEIR and site at this time. If you have any questions or comments, please do not hesitate to contact me at (831) 426-9054.

Sincerely,

PETER HAASE, P.E.
Principal Engineer

FALL CREEK ENGINEERING, INC.

PETER H. HAASE

EDUCATION

B.S., 1985, Environmental Resource Engineering, Humboldt State University

PROFESSIONAL CERTIFICATION

California Registered Civil Engineer, No. C055605
California Registered Environmental Assessor, No. REA-05703

PROFESSIONAL EXPERIENCE

1998-Present. Principal Engineer. Fall Creek Engineering, Inc. Specializes in small community water and wastewater system design, surface water hydrology, water resource planning and management, surface and ground water pollution control, irrigation system evaluation and design, and water quality/quantity monitoring system design.

1994-1997. Senior Engineer. Applied Science and Engineering, Inc. Project manager and senior engineer on a variety of projects in the areas of surface water hydrology, water resource planning and management, small community water and wastewater system designs, irrigation system evaluation and designs.

1993. Consulting Engineer. Municipal Water Agency, County of San Pedro Sula, Honduras, Central America. Independently contracted by the County to develop a water resources management plan for surface and ground water resources in the county; developed preliminary water pollution control legislation (this was the first environmental control legislation developed in the country) and a feasibility study for its implementation. Completed a technical study to establish land use controls to protect ground water resources in the region. Provided technical support in the evaluation of the wastewater, solid and hazardous waste master plans being developed by two private international consulting firms for the municipality of San Pedro Sula.

1990-1992. Project Engineer (Volunteer). U.S. Peace Corps, Water and Sanitation Project, Honduras, Central America. Job responsibilities included: assessment and trouble-shooting of rural water systems; project feasibility studies; topographic surveys; system designs; material and cost estimation; execution and management of labor contracts; transportation and construction planning; and construction supervision.

1986-1990. Water Resource Control Engineer. California State Water Quality Control Board, Central Valley Region, Sacramento Office. Responsible for the preparation of State and Federal permits for municipal and industrial wastewater facilities, private and public solid waste landfills, implemented state underground storage tank laws, supervised municipal industrial pretreatment programs, and conducted technical evaluations of land treatment of waste projects, ground water investigations, surface water modeling and monitoring programs and toxicity identification/evaluation studies.

1985-1986. Grice Engineering, Inc., Salinas, California. Responsible for design projects and technical studies. Design projects included: water supply (ground water wells) and distribution systems; grading and drainage plans and storm runoff control facilities; onsite wastewater treatment systems; and small agroindustrial wastewater treatment systems. Technical studies included: ground water hydrology studies; soils investigations; and concrete floor and foundation studies.

PUBLICATIONS/PRESENTATIONS

1. "Municipal Water Resource Planning and Management", Presentation at Seminar on Water Resource Protection and Management in San Pedro Sula, Cortés, Honduras, Central America, 9 December 1993 (presentation in Spanish)

2. Betancourt, D. and P.H. Haase, 1992, "Monitoreo Intensivo de los Puntos de Descargas de la Red de Alcantarillado Sanitario para la Ciudad de San Pedro Sula, Cortés, (Wastewater Characterization Study of all Discharges from the Municipal Sanitary Sewer of San Pedro Sula, Cortés), prepared for the Municipal Water Division of San Pedro Sula, Cortés, Honduras (DIMA) and the Interamerican Development Bank.

3. Haase, P.H., 1993, "Presentación de las Normas de Control de Aguas Residualcs Establecidas en Otros Paises y Costos de Tratamiento (Summary of Industrial Wastewater Control Standards in Different Countries and the Cost of Compliance by Several Types of Industries)", presented to DIMA and the Panamerican Health Organization (PAHO).

4. Haase, P.H. and M. Sagastume, 1993, "Control sobre Usos del Suelo para Proteger las Aguas Subterráneas de San Pedro Sula, Cortés (Land Use Controls to protect Ground Water Resource in the Region of San Pedro Sula, Cortés), presented to DIMA, PAHO and the Honduran National Water Agency (SANAA).

5. "Towards Water Resource Management in San Pedro Sula, Cortés, Honduras", Technical Paper presented at the 1996 Annual Conference of the California/Nevada Section of the American Water Works Association, April 1996.

6. Batis, E., R. Rivera, G. Hill and P.Haase, 1996, "Computer Use for Laboratory Quality Assurance and Water Treatment Plant Operations", Technical Paper presented at the 1996 Annual Conference of Computer Use in Water Facility Operations, American Water Works Association, Austin, Texas.

7. Haase, P. H. and M. Sagastume, 1997, "A Model Program: Management and Protection of Ground Water Resources in San Pedro Sula, Cortes, Honduras", Technical Paper presented at Water Resources Management: Preparing for the 21st Century Conference, American Water Works Association, Seattle, Washington.

LANGUAGES

Strong fluency in written and conversational Spanish.

FALL CREEK ENGINEERING, INC.

RICHARD ARMSTRONG

EDUCATION

A.B., 1961, Zoology. University of California, Berkeley
M.S., 1965, Biology. University of North Dakota
Ph.D., 1969, Limnology. University of California, Davis

PROFESSIONAL CERTIFICATION

California Registered Civil Engineer, No. C048116
California Registered Environmental Assessor, No. REA-03661

PROFESSIONAL EXPERIENCE

1998-Present. Principal Scientist. Fall Creek Engineering, Inc. Specializes in water and soil quality investigation and remediation, groundwater hydrology, hazardous site restoration, environmental regulatory compliance, data analysis, and landfill design.

1985-1997. Principal Scientist. Applied Science and Engineering, Inc. (successors to Richard Armstrong and Associates). Specializes in water and soil quality investigation and remediation, groundwater hydrology, hazardous site restoration, environmental regulatory compliance, data analysis, and landfill design.

1980-1985. Principal Scientist. McLaren Environmental Engineering Inc., Rancho Cordova, CA. Designed and implemented remedial investigations of groundwater contamination at California's top-ranked "Superfund" site. Selected drilling locations and techniques, specified sampling and analytical techniques, designed monitor wells and monitor well sampling protocols, participated in design of QA/QC programs, designed and implemented Health and Safety Plans, designed data management systems, provided hydrogeologic interpretations, directed geologic analysis, designed numerical models of ground water flow and contaminant transport for risk assessment, participated in design of remedial measures. Designed and managed multidisciplinary ecological assessments.

1974-1979. Self-employed Mining Consultant. Lusaka, Zambia. Operated an industrial minerals venture in Zambia. Mined and processed kaolin, silica flour, and pulverized calcite. Designed and built a plant to produce aluminum sulfate from kaolin. Developed methods of production and produced a variety of specialty chemical products (starch based mucilage, sodium bicarbonate, sodium hydroxide, cobalt and zinc napthenate, lead chromate, and light precipitated calcium carbonate) for a small market. Consultant to other small enterprises dealing in pharmaceuticals, paint, and plastics. Served as chairman of the Environmental Quality Advisory Committee and interpreted numerous environmental quality issues to responsible parties in the government. Met regularly with officials of the mining industry and nurtured their commitment to maintenance of acceptable water quality conditions in the Kafue River, a major stream having its source in the copper mining area.

FALL CREEK ENGINEERING, INC.

1972-1974. Lecturer in Fisheries Science and Water Resources Management. Government of the Republic of Zambia, Ministry of Agriculture and Water Resources, Natural Resources Development College, Lusaka, Zambia. Taught courses in fisheries management, fish culture, hydraulic structures, water well drilling and construction, and basic ground-water hydrology. Served as national chairman of the environmental quality advisory committee, addressed public meetings on environmental issues, wrote numerous non-technical articles for the popular press explaining local environmental issues, and served as an environmental consultant to the mining industry in Zambia.

1969-1971. Water Quality Scientist. Food and Agricultural Organization of the United Nations, United Nations Development Project in Zambia, Lusaka, Zambia. Equipped and operated water quality laboratories. Trained water quality chemists and pollution control technicians, Zambia. Equipped and operated water quality laboratories. Trained water quality chemists and pollution control technicians. Planned and implemented a national water quality monitoring program for the Republic of Zambia. Designed and directed a continuous bioassay program to monitor aqueous effluent from a coal-based nitrogen fertilizer plant and leachate from tailings at a copper mine entering the Kafue and Zambezi Rivers. Organized and chaired a national environmental quality advisory committee, convened and addressed public meetings on environmental quality issues.

1966-1969. Research Assistant. University of California, Davis, CA. Conducted bioassays of culturally enriched stream waters using radioactive carbon and microorganisms, equipped and operated a water quality laboratory, developed new chemical techniques for measuring very low levels of growth in periphyton, supervised field work in a multi-faceted limnological investigation of Lake Tahoe.

1963-1966. Research Assistant. University of North Dakota, Grand Forks, ND. Conducted bioassays of industrial wastes from sugar beet refining using freshwater fish and invertebrates, equipped and operated a water quality laboratory.

PUBLICATIONS

1. Armstrong, R., D. Anderson, and E. Callender. 1966. Primary Productivity Measurements at Devils Lake, North Dakota. Proc. N.D. Acad. Sci. 20:136-148

2. Armstrong, R. and R. Tubb. 1967. Uptake of phenylalanine and glycine by aquatic invertebrates. Proc. N.D. Acad. Sci. 21:

3. Armstrong, R. 1969. Phytoplankton community structure in Castle Lake, California. Ph.D. dissertation. University of California, Davis. 149 p.

4. Armstrong, R. and C.R. Goldman. 1969. A method for the determination of microgram quantities of molybdenum. in ASTM, Special Technical Publication No. 448

5. Goldman, C.R. and R. Armstrong. 1969. Primary Productivity studies in Lake Tahoe, California. Verh. Internat. Ver. Limnol. 17:49-71

6. Goldman, C.R., M.G. Tunzi, and R. Armstrong. 1969. Carbon-14 uptake as a sensitive measure of the growth of algal cultures. FWPCA Symposium, Berkeley, June, 1969, pp 158-170

7. Callender, E. and R. Armstrong. 1969. Calcium mineral equilibria in Devils Lake, N.D. ASLO Western Division Symposium on Undrained Basins, Logan, May 1969.

8. Richerson, P., R. Armstrong, and C.R. Goldman. 1970. Contemporaneous disequilibrium, a new hypothesis to explain the "paradox of the plankton". Proc. Nat. Acad. Sci. 67:1710-1714

9. Armstrong, R., C.R. Goldman, and D.K. Fujita. 1971. A rapid method for the estimation of the carbon content of seston and periphyton. Limnol. Oceanogr. 16:137-139

10. Armstrong, R. 1973. Water Quality Considerations in Zambian Fisheries Development. FAO, Rome. ZAM/FI

11. Armstrong, R. 1982. Measurement of the soil-water partition coefficient for tetrachloroethylene using C-14 labelled tetrachloroethylene. Confidential report to Aerojet General Corporation, Sacramento Environmental Operations.

12. Armstrong, R. and C.B. Andrews. 1983. Hydrologic effectiveness of interim control facilities at Aerojet General Corporation, Sacramento Facility. Report to CVRWQCB, DHS, and EPA. Rancho Cordova, Dec 14, 1983.

13. McLaren, F. R., R. Armstrong, and G.M. Carlton. 1982. Investigation of Large Scale Groundwater Contamination in Alluvial Aquifers. Paper read Oct 7, 1982 in St. Louis, MO.

14. Armstrong, R. and F. R. McLaren. 1984. The Suction Side Sample Catcher in Groundwater Quality Sampling. Groundwater Monitoring Review 4:(4) 48-52.

15. Andrews, C.B. and R. Armstrong. 1985. Aquifer characteristics in the western part of Sector E. Document GG of Aerojet General Corporation reports to CVRWQCB, DHS, and EPA. May 1985.

16. Hadley, P. W. and R. Armstrong (1991). "Where's the Benzene ? - Examining California Ground Water Quality Surveys." Ground Water 29:(1) 35-40.

FALL CREEK ENGINEERING, INC.
Civil • Environmental • Water Resource Engineering and Sciences
Tel. (831) 428-9054 P.O. Box 7894, Santa Cruz, CA 95061 Fax. (831) 426-4802

February 10, 2002

Elena Belsky
P.O. Box 377
San Geronimo, CA

John Sharp
Sharp & Brown, LLP
630 Las Gallinas Avenue, Suite 310
San Rafael, CA 94903

Subject: **Rebuttal to Comments on Technical Review of Final EIR**
Point Reyes Affordable Housing Project SCH# 2000052112

Dear Elena and John,

On January 28, 2002 Peter Haase of this firm provided you with a technical review of the subject EIR. Mr. Haase's remarks identified 4 topics that he felt had not been adequately treated in the EIR and supporting documents. The tone and intent of his remarks was to call attention to his opinion that certain aspects of the project design had not been properly validated and could very well be flawed.

On February 4, 2002 Norman Hantzche of Questa Engineering Corporation commented on Mr. Haase's remarks pointing out what he perceived to be errors of judgement and omission. Mr. Haase being out of the country, it is my task to rebut Mr. Hantzche's comments.

Topic 1: Onsite Disposal of Wastewater and Stormwater Runoff
Mr. Haase made the observation that the plan was to put both waste water and stormwater from the Papermill Creek apartments and houses in infiltration trenches in the portion of the property having the least depth to groundwater. Mr. Hantzche said the opposite was true and could be verified by reference to a February 1, 2000 Questa report, "*On-site Sewage Disposal Feasibility Report*" (Feasibility Report). This document was not part of the EIR and Mr. Haase hadn't seen it. Mr. Haase had only seen the November 13, 2000 Questa report "*Addendum to Drainage Plan for Point Reyes Affordable Housing*", the November 22, 2000 Questa report "*Hydrogeologic Report for Point Reyes Affordable Housing*", and the EIR itself, particularly Exhibit 4.4.1 showing the locations of the leachfields. The EIR and the Addendum show where the infiltration facilities for the Papermill Creek houses and apartments are to be and the Hydrogeologic Report shows that this is the part of the property with the two wells having the least observed depth to

EXHIBIT B

groundwater. The situation described in the EIR documents is the opposite of what Mr. Hantzche claimed.

I was fortunate enough to be given a copy of the Feasibility Report so I can pass on whatever clarity that document brings to the issue. Unfortunately the document doesn't mention stormwater infiltration or seasonal variations in depth to groundwater so it clarifies nothing. It's a valuable document and will be mentioned when it has something to contribute. It should have been included in the EIR.

Mr. Haase's concern about the wastewater and stormwater both being put in a place where there could occasionally be high groundwater was that no demonstration had been included in the EIR that the ground could always take the water presented for infiltration. If the ground failed to take the water, septic tank effluent would appear at the surface. Mr. Hantzche countered that the subject had been adequately treated in the Feasibility Report.

The Feasibility Report does deal with part of the issue. It presents calculations purporting to show the thickness of saturated flow emanating from the wastewater leachfields. It does not burden the analysis with an account of the water emanating from the stormwater infiltration trenches. Mr. Hantzche believes that the 50-foot physical separation of the two types of infiltration trenches is sufficient to rule out interaction between them. If the seepage front from the wastewater infiltration moves slowly enough and the seepage is attenuated enough by evapotranspiration, he might be right. If the EIR contained the data and reasoned analysis to show such was the case, there would be no issue here about interference from stormwater. It is not evident *a priori* that such would be the case and the burden was on the EIR preparers to present the data and analysis. That is what Mr. Haase asked for and it is not present in the EIR nor in the Feasibility Report. It still needs to be presented for scrutiny.

The Feasibility Report handles the issue of mounding by using Darcy's law to calculate the thickness of saturated porous material that would transmit the design flow of the leach fields. The technique requires a measurement or estimate of the hydraulic conductivity of the porous medium through which the effluent is seeping. The calculated thickness is inversely proportional to the conductivity value chosen. The Feasibility Report authors used the same conductivity value for all their calculations. It was based on the observation that "The data for the 48-inch and 60-inch percolation tests indicate a consistent rate of better than 5 MPI across the lower portions of the site where the leachfields will be located" (Feasibility Report, p 13). The authors translated the 5 minutes per inch (MPI) to a hydraulic conductivity of 24 feet per day (fpd) and then elected to use 20 fpd "to be more conservative (safe)".

The "lower portions of the site" referred to embrace the lower leachfield for the Papermill Creek apartments and leachfields 2, 3, 4, 5, 6, 7. Each of these leachfields had one to several percolation tests performed in it. The data from these percolation tests are shown in Table 1.

Table 1. Percolation Test Data: Leachfields of Papermill Creek Apartments and Homes Data from Questa Engineering Corporation, Extracted From The EIR

Leachfield	Test Holes	MPI	Average MPI	K in Ft/day
Lower Leachfield	P7	18.9		
	P80	23.4		
	P81	20.7		
	P82	4.2		
	P83	8.9	15.2	7.9
LF 2	P5	14.3	14.3	8.4
LF 3	P89	15.6		
	P90	23.4	19.5	6.2
LF 4	P1	15	15	8
LF 5	P2	40.1		
	P3	1.3	20.7	5.8
LF 6	P4	22.5	22.5	5.3
LF 7	P6	14	14	8.6

The claim made in the Feasibility Report is a prevarication. The conductivity of the soils tested by Questa was not 24 fpd or higher. The average conductivity was 7.2 fpd and the various estimates didn't differ widely from the average.

The implication for the Feasibility Report's "mound analysis" is that all its estimated depths of flow have to be multiplied by 2.78 (20 divided by 7.2). This will show that none of the leachfields mentioned here will meet the required separations from groundwater. Perhaps Mr. Hantzche would like to try again with a more sophisticated mode of analysis such as a complete water balance as Mr. Haase suggested.

Topic 2. Hydrogeologic Investigation

Mr. Haase noted that the estimated travel time for groundwater moving from the site to Lagunitas Creek is around one year. This is short enough to raise the question of live viruses surviving long enough to move from the wastewater disposal trenches to the creek. Especially if they surface in the wetlands short of the creek and are swept in by surface water. It's a legitimate concern that could benefit from an analysis taking into account a wider range of seasonal variations and the extent to which the hydrologic regime might change when the project is implemented.

Definition of the capture zone of the water supply well was also an issue. Considering the topography and geology of the area I don't suspect that water from the project site will be captured by the well under any circumstance. I don't expect people to take my word for it though, and neither should Mr. Hantzche. I didn't find Exhibit 4.5.2 compelling.

Topic 3. Cumulative Impacts to Groundwater and Surface Water Quality

Mr. Haase pointed out that Lagunitas Creek is on the 303(d) list of impaired waterways and there should be a discussion of how nitrates originating from the project might add to

FALL CREEK ENGINEERING, INC.

the nutrient problem already existing in the creek. Mr. Hantzche responded that a "nitrate loading analysis" was already prepared and was presented in the Feasibility Report. I read the analysis and found it did not relate to the question Mr. Haase raised. The analysis in the Feasibility Report considers whether the groundwater concentration of nitrate-nitrogen in certain target zones could exceed 10 milligrams per liter (mg/l) under various scenarios of nitrogen loading and recharge. Lagunitas Creek was not one of the target zones considered. Anyway, Mr. Haase's concern was not that the project might elevate the nitrate concentration in groundwater near the creek to a prescribed level. Mr. Haase asked for an analysis that would show whether any nitrate would enter the creek because of the project and if it did what would be the impact. Nothing in the Feasibility Report or the EIR touches on that question. That is why Mr. Haase found the EIR inadequate with respect to that topic.

Mr. Hantzche goes on to make the interesting claim that substituting the agricultural activities at the site with houses and apartments will "eliminate one of the identified sources of the existing water quality impairment – i.e. agricultural runoff." That seems not to be directed at Mr. Haase so I won't rebut it.

Topic 4. Stormwater Management

The remainder of the exchange between Mr. Haase and Mr. Hantzche touches on stormwater handling and works its way back to the issue of whether the ground can accept all the water planned to be placed on it. Mr. Haase suspects the ground won't take the water and there will be more surface water runoff than expected. This would warrant more hydrologic analysis down slope from the project. Mr. Hantzche is confident that the stormwater will remain on site and no further surface hydrology is required. The arguments offered are not different than what were covered under the other topics. Mr. Haase wants data and analysis to show there won't be a problem. Mr. Hantzche says there won't be a problem and therefore no more data or analysis are required.

The most important message in this rebuttal is that the analysis offered in the Feasibility Report to "prove" there would be adequate separation of wastewater and groundwater is erroneous. It is erroneous on its own terms. When the authors' own data are used in the analysis it indicates there would not be adequate separation. Perhaps that is why the authors did not use the percolation data presented in their reports but opted to assume a value that would seem to prove what they wished to be the case.

I hope these brief remarks will be of some use to you. I can be reached at (530) 756-2288.

Sincerely yours,

Richard Armstrong, Ph.D., P.E.
Principal Scientist

FALL CREEK ENGINEERING, INC.
Civil • Environmental • Water Resource Engineering and Sciences

Tel. (831) 426-9054 P.O. Box 7894, Santa Cruz, CA 95061 Fax. (831) 426-4932

March 18, 2002

Elena Belsky
P.O. Box 377
San Geronimo, CA 94963

John Sharp
Sharp & Brown, LLP
630 Las Gallinas Avenue, Suite 310
San Rafael, CA 94903

Subject: **Supplemental Project Review – Point Reyes Affordable Housing Project SCH# 2000052112**

Dear Elena and John:

Fall Creek Engineering, Inc. (FCE) has reviewed additional technical information pertaining to the above referenced project, including the 5 March 2002 response letter prepared by Questa Engineering, Inc. FCE has prepared this letter to address issues raised by the current project analysis provided by Questa Engineering in the above referenced letter.

Based on our review of the recent information provided by Questa Engineering and accompanied documents, FCE does not concur with Questa about the effects the conditions governing wastewater infiltration will have on the underlying groundwater and long-term operation of the onsite wastewater systems. The following letter provides additional information to address these deficiencies.

1. Background Studies.

Mr. Hantzche could very well be correct that there are materials we haven't had the opportunity to look at. FCE does not think it serves the public well when documents of wide general interest are so difficult to locate. Based on our further review of additional background documents, FCE has encountered inconsistencies with the early findings presented by Questa Engineering. These inconsistencies raise questions as to the overall feasibility of the currently proposed project. Some of these inconsistencies are noted below.

EXHIBIT C

2. Groundwater Conditions

This topic is generating more discussion than it needs considering it's a straightforward factual issue. Now we're taken to task for not considering the wetlands areas to be the loci of the highest groundwater. The real question is: how deep beneath the ground surface is the highest expected groundwater table in the areas expected to be used for wastewater disposal? The first evidence we saw was in the Hydrogeologic Investigation appended to the EIR. It showed depths to the water table of 3 to 6 feet at wells 3 and 4, which bracket the leachfields and infiltration trenches on the east half of the property. As previously stated the location of the lower leachfield for the Paper Mill Apartment and Leachfield #7 for the Lot 7 of the individual homes will be constructed in areas were groundwater was measured to be 6 and 3 feet below surface, respectively.

That being said, FCE questions the use of groundwater data measured in wells drilled into the bedrock to represent the water table in the overlying soil. The monitoring wells at this site are sealed with cement and bentonite from the ground surface to at least 11 feet deep. This seal isolates the wells from any groundwater contained in the first 11 feet. Other data gathered by Questa were found to be consistent with some degree of confinement of the bedrock groundwater system. This should have strongly cautioned them not to rely on the bedrock groundwater pressure as a reliable indicator of the height of any free water table in the overlying soil.

Questa assumes that the depth to the water table beneath the trenches is 9 feet, more or less. There have been times when the depth to groundwater has been this deep in the areas where the leachfields are to be placed. There have not been regular observations to show that the water table is consistently this deep during wet weather. Anecdotal reports place the water table in this area—possibly a perched water table—virtually at the ground surface during the winter months. Screened observation holes should have been placed in the prospective infiltration areas to support the investigation. By this time there could have been observations gathered in three different winter season.

2. Groundwater Mounding Analysis

FCE has reviewed the revised groundwater mounding analysis prepared by Questa Engineering presented in the 5 March 2002 letter. The method selected by Questa Engineering to predict groundwater mounding conditions under the proposed leachfields is very simplistic and conservative. Our review of the analysis finds that a key parameter (hydraulic conductivity) used in the analysis is incorrect and an unreasonable value and the results presented by Questa underestimate the potential mounding at the site.

In the mounding analysis performed by Questa, Mr. Hantzsche assumes that the hydraulic conductivity is equal to the percolation rates measured at the site. (As an aside, Questa should confirm that they performed the percolation measurements with the standard 6 inches or less of head, and not with heads of 21 to 57 inches as their report shows.) Questa converted the measured percolation rate in units of minutes per inch to feet per day and assumes that this value (20 feet per day) is the saturated hydraulic

conductivity of the soils. This assumption is technically invalid. Although the units of percolation rate and hydraulic conductivity of soils are both those of a velocity, neither of these parameters is actually a velocity. Moreover, there is a distinct difference between these two quantities (ASTM, 1994[1]). A relationship between them cannot be established by regression analysis unless both parameters are measured on the same soil profiles.

Several investigators (Winnebeger, 1974[2]; Fritton et al., 1986[3]) have conducted studies in search of the relationship between saturated hydraulic conductivity and soil percolation rate. Empirical equations have been developed from pairs of measurements of the two parameters on the same soil. Winnebeger (1974), using several uniform California soils, provided regression equation [1]:

$$\log K = 1.210 \log P - 0.306 \qquad [1]$$

where

log = base 10 logarithm,
K = saturated hydraulic conductivity (m/s),
P = percolation time (s/m).

Fritton et al., (1986) also developed an equation relating hydraulic conductivity to percolation for paired tests performed in Pennysylvania soils developed in shales and sandstone colluvium. The results of their investigation provided the following equation [2]:

$$\log K = -0.309 \log P - 4.296 \qquad [2]$$

Applying these relationships to the case where the measured percolation rate is 5 MPI, the value proposed by Questa Engineering, FCE calculated hydraulic conductivity of either 0.8 ft/day (Eq. [2]) or 6.8 ft/day (Eq. [1]). Using these conductivity values FCE recalculated the estimated groundwater mounding using the method used by Questa Engineering. The revised calculations are presented in Tables 1 and 2.

Applying the more generous hydraulic conductivity value of 6.8 ft/day (rather than the 20 ft/day used in Questa's analysis), the results indicate that four septic systems will become flooded and the lower leachfield serving the Papermill Creek Apartments would fail (septic tank effluent will surface) during periods of high groundwater.

All but two of the proposed leachfields will not meet the County of Marin's groundwater separation requirement (regardless if the requirement is set at 36-, 24- or 18-inches). (As a second side note, Questa Engineering should explain how they derived the "required separation" presented in their tables for the conventional septic systems

[1] American Society for Testing and Materials. 1994. *Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer.* ASTM Method D 3385-94
[2] Winneberger, J.T. 1994. *Correlation of Three Techniques for Determining Soil Permeability*, Journal of Environmental Health, Vol. 37, No. 2.
[3] Fritton, D.D., T.T. Ratvasky, and G.W. Petersen. 1986. *Determination of Saturated Hydraulica Conductivity from Soil Percolation Test Results.* Soil Scicence Society of American Journal. Vol. 50

reported as 18- and 24-inches. FCE was unable to find any reference to these requirements in the County Codes. It appears that Questa Engineering applied groundwater separation standards applicable to alternative septic systems; however, these types of system are not permitted for new subdivisions or created lots.)

Applying the lower hydraulic conductivity value (0.8 ft/day) indicates that all of the septic systems will become flooded and fail during the rainy season.

In conclusion, FCE finds that the groundwater mounding analysis prepared by Questa Engineering is flawed. Had Questa Engineering applied a correct saturated hydraulic conductivity to their mounding analysis, they would have concluded that the leachfields will flood.

Table 1. Revised Groundwater Mounding Calculations
(K = 6.8 ft/day)

Parameter	Unit	Single Family Homes							Papermill Creek		Public	William St.	Future
		Leachfield Area - Lot #											
		1	2	3	4	5	6	7	Upper	Lower	Restroom	Apartments	Commercial
Design Flow	ft^3/day	40	40	40	40	40	40	40	225	225	60	360	203
Hydraulic Conductivity	ft/day	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8
Leachfield Cross-Section Length	ft	35	35	35	30	30	45	75	110	140	100	130	105
Groundwater Gradient	ft/ft	0.05	0.05	0.05	0.05	0.05	0.04	0.03	0.1	0.022	0.1	0.08	0.05
Predicted Groundwater Rise	inches	40	40	40	47	47	39	31	36	129	11	61	68
Total Unsaturated Soil Depth	inches	84	84	84	84	84	84	84	96	108	90	90	90
Trench Bottom Depth	inches	36	36	36	36	48	48	36	36	36	36	36	36
Available Unsaturated Soil Depth below trench	inches	48	48	48	48	36	36	48	60	72	54	54	54
Predicted Net Separation to Groundwater	inches	8	8	8	1	-11	-3	17	24	-57	43	-7	-14

Table 2. Revised Groundwater Mounding Calculations
(K = 0.8 ft/day)

Parameter	Unit	Single Family Homes Leachfield Area - Lot # 1	2	3	4	5	6	7	Papermill Creek Upper	Lower	Public Restroom	William St. Apartments	Future Commercial
Design Flow	ft^3/day	40	40	40	40	40	40	40	225	225	60	360	203
Hydraulic Conductivity	ft/day	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Leachfield Cross-Section Length	ft	35	35	35	30	30	45	75	110	140	100	130	105
Groundwater Gradient	ft/ft	0.05	0.05	0.05	0.05	0.05	0.04	0.03	0.1	0.022	0.1	0.08	0.05
Predicted Groundwater Rise	inches	343	343	343	400	400	333	267	307	1096	90	519	580
Total Unsaturated Soil Depth	inches	84	84	84	84	84	84	84	96	108	90	90	90
Trench Bottom Depth	inches	36	36	36	36	48	48	36	36	36	36	36	36
Available Unsaturated Soil Depth below trench	inches	48	48	48	48	36	36	48	60	72	54	54	54
Predicted Net Separation to Groundwater	inches	-295	-295	-295	-352	-364	-297	-219	-247	-1024	-36	-465	-526

3. Cumulative Impacts to Groundwater Quality

Nitrate Loading. FCE has reviewed the cumulative impact analysis to estimate nitrate loading prepared by Questa Engineering. Wastewater loading calculations performed by Questa Engineering (letter dated 28 August 1998) states that "the maximum wastewater loading allowable would be limited to approximately 2,200 gpd on the West Side of the site and approximately 4,600 gpd on the East Side of the site for a total of 6,800 gpd". Under the proposed development plan proposed in the FEIR and restated in the 5 March 2002 letter prepared by Questa Engineering, the projected wastewater flows on the West Side of the property will be 4220 gpd and the volume of wastewater discharged to the East Side will be approximately 5,476 gpd, for a total of 9,696 gpd. These flow projections exceed "the maximum wastewater loading" by approximately 42%, as previously stated by Questa Engineering. Assuming that Questa's nitrate load estimates were valid, FCE concludes that the current development plan will exceed the nitrate load restrictions established by Marin County.

The more recent "On-site Sewage Disposal Feasibility Report", (Questa, February 1, 2000) presents calculations to show that the West Side wastewater loading of 3,825 gpd and East Side loading of 5,040 gpd would be acceptable if the runoff in an average year was less than 10 percent of rainfall. Had the calculation been updated to model the current plan of discharging 9,696 gpd, the computed concentration of nitrate-nitrogen at the down gradient edge of the property would have crept up to 9.92 mg/L in an average rainfall year with 5 percent runoff and to 10.55 in an average year with 10 percent runoff. This latter case exceeds the Marin County Requirements for cumulative impacts to

groundwater. This dance on the threshold should have rated a comment in the FEIR, and a closer examination of the assumptions under which the calculations were made.

The conceptual model underlying these calculations provides unrealistic estimates of nitrate-nitrogen concentrations in the underlying shallow groundwater. The model calculates the hypothetical nitrogen concentration resulting from the complete mixing of a year's wastewater with all the groundwater recharged on the entire site within one average year. It does not postulate any mechanism for achieving this mixing or give consideration to how the concentration might vary in different parts of the system. Commonsense dictates that positions on the downgradient site boundary will vary in nitrogen concentration according to whether or not they are directly in the path of water passing beneath an infiltration area. Simple tools to perform the calculations more realistically on the basis of the advection-dispersion equation are widely available in any textbook on groundwater.

Impacts to North Marin Water District Well. FCE is troubled by Mr. Hantzsche's dismissal of the public concern regarding the potential impacts to the North Marin Water District Well. FCE maintains that Questa Engineering has not conducted an adequate field study of the groundwater flow conditions between the site and the water supply well. A more convincing evaluation might have made use of a surface geophysical survey to show the disposition of the bedrock surface and guide the placement of pertinent monitoring wells. With better placed wells Questa would have been better able to assess the capture zone of the well and the potential impacts from the proposed wastewater systems at the subject property. FCE further recommends that Marin County consider retaining a groundwater consultant qualified to perform the analysis. Lastly, Dr. Armstrong's quotation cited in Mr. Hantzsche's letter dated 5 March 2002 related to this topic was taken out of context. Dr. Armstrong was only making the point that his opinion is not sufficient grounds to dismiss a potential environmental impact, but rather, without a proper and thorough analysis ~~of~~ the potential impacts cannot be determined.

4. Stormwater Management

FCE has reviewed the *"Drainage Plan for Point Reyes Affordable Housing Project"* (Questa Engineering, April 13, 2000) as recommended by Mr. Hantzsche. FCE found that this study and subsequent drainage plans prepared by Questa, do not evaluate how the proposed drainage systems will affect groundwater mounding at the site. The hydraulic analysis performed by Questa only evaluates short-term drainage capacity of the specific infiltration trenches for the 24-hour design storm events. The analysis did not take into consideration the ability of the site to accommodate the runoff over the course of the year and what potential impacts these changes will have on the proposed wastewater systems.

Stormwater drainage system analyses always consider how infrastructure will work under the conditions imposed by large storms. Storm sewers, culverts and disposal systems (i.e. infiltration trenches) have to be sized to accept occasional large storms. We

don't dispute that practice or the way it was carried out for this project. Our concern is that the operation of an important part of the system was not considered in Questa's analyses. We don't find any analysis of how the soil adjacent to the infiltration trenches will respond when it is presented with the stormwater. The movement of water through soil is much slower than overland flow and so it needs to be analyzed on a much different time scale than would be appropriate for analyzing a storm sewer or infiltration trench. The amount of water that will infiltrate a unit of soil today is highly dependent on the water content of the surrounding soil and underlying groundwater, which in turn is dependent on its history going back days, weeks, or even months.

Analyzing the soil and groundwater response to stormwater loading is more difficult than it is for wastewater because stormwater discharges are intermittent while wastewater flows are less variable and can be analyzed as constant flows. Analysis of intermittent flows must be done with a modeling tool that makes daily calculations for one or more years and incorporates realistic weather patterns. Of course, the calculations require a measured, estimated, or assumed value for the hydraulic conductivity of the soil. We have not been able to agree with Questa on what might be appropriate for this site. Given enough hydraulic conductivity the introduced stormwater will infiltrate the soil and disappear down slope very readily. Lower hydraulic conductivity will result in the water remaining in the vicinity of the trenches where it will interfere with subsequent discharges of water.

To illustrate the type of tool applicable to this problem, FCE has prepared a sample model utilizing the US Army Corps of Engineers (USACE) HELP3 model. We haven't done this with the purpose of modeling any actual condition at the site, but rather to illustrate how recharge and soil water content change seasonally and annually at a site. We think it illustrates that more thorough analysis of these conditions is warranted and would be valuable.

Help3 is a hydrologic evaluation model designed to model water movement through unsaturated soil layers. The model uses a daily time-step for simulations of up to 100 years. FCE prepared the sample model for a 6.9-acre site meant to characterize the extreme east side of the subject property where the Papermill Creek Apartment and houses are proposed. The model was utilized to analyze the change in groundwater elevations under the site over a 10-year period using different rainfall years under natural undeveloped conditions. Input parameters including rainfall, evapo-transpiration, soil and vegetation conditions, hydraulic conductivity and other parameters were selected for site conditions reported by Questa Engineering and others.

The results of the modeling are summarized in Tables 3 and 4, which shows the monthly change or rise in groundwater levels. A copy of the model input and output data is presented in Attachment 1. The model results illustrate how groundwater levels will vary seasonally and annually and show how these levels will change from a normal to wet year. Assuming the correctness of the parameters we used, one can see that during one wet year (Year 7) groundwater at the site will rise substantially from February

through March. Following two consecutive wet years (Years 7 and 8) groundwater levels will be near surface for several months.

As previously described, the proposed drainage plan prepared by Questa Engineering will involve the construction of infiltration trenches on the low lying portions of site. Concentration runoff from the majority of the property and a portion of Mesa Road will be directed to these systems. Recognizing that these systems will be constructed in the vicinity of the leachfields, FCE still maintains that a thorough water budget should be prepared to evaluate groundwater mounding conditions in the vicinity of the proposed leachfields and stormwater infiltration systems.

Additionally, stormwater runoff from the West Marin School and William Street Apartments will be directed to the existing wetlands. FCE was unable to locate any drainage analysis that demonstrates that the existing wetlands have sufficient capacity to detain or retain this runoff in conformance with the Main County standards. FCE assumes that this analysis has not been completed to date and is a data gap in Questa's drainage analysis.

Table 3. Sample Calculations for Monthly Groundwater levels (in inches)
6.9-Acre Coastal Terrace Parcel in Marin County

	Year									
	1	2	3	4	5	6	7	8	9	10
Total Annual Rainfall (inches)	25.46	37.94	25.46	28.72	36.31	24.43	46.5	45.75	25.35	40.36
Month	**Monthly Average Rise in Shallow Groundwater (in inches)**									
January	26.8	40.1	54.6	32.3	17.3	40.9	37.7	64.1	53.1	61.9
February	27.7	55.7	54.8	36.0	26.3	41.6	79.6	88.5	60.0	74.2
March	36.3	54.2	56.0	42.0	33.6	37.0	87.0	100.9	57.1	73.8
April	35.8	54.1	50.3	49.2	39.2	32.6	78.5	92.8	51.1	73.4
May	31.6	50.7	47.9	46.8	38.9	28.7	69.6	82.6	45.3	68.6
June	27.8	44.9	42.7	41.5	36.2	25.2	61.6	73.2	40.0	60.8
July	24.4	39.6	37.7	36.7	32.0	22.1	54.6	64.8	35.3	54.0
August	21.4	34.9	33.1	32.3	28.1	19.3	48.3	57.4	31.0	47.6
September	18.7	30.9	29.2	28.4	24.6	16.8	42.7	50.8	27.3	42.1
October	16.3	27.1	25.6	24.9	21.7	14.6	37.7	45.0	23.9	37.2
November	14.1	26.2	22.5	21.9	19.0	12.7	33.2	39.7	21.0	32.8
December	21.6	41.5	19.8	19.1	18.9	16.8	30.1	37.5	25.2	31.3

Table 4. Sample Calculations for Monthly Groundwater levels (in feet)
6.9-Acre Coastal Terrace Parcel in Marin County

	Year									
	1	2	3	4	5	6	7	8	9	10
Total Annual Rainfall (inches)	25.46	37.94	25.46	28.72	36.31	24.43	46.5	45.75	25.35	40.36
Month	**Monthly Average Rise in Shallow Groundwater (in feet)**									
January	2.2	3.3	4.6	2.7	1.4	3.4	3.1	5.3	4.4	5.2
February	2.3	4.6	4.6	3.0	2.2	3.5	6.6	7.4	5.0	6.2
March	3.0	4.5	4.7	3.5	2.8	3.1	7.2	8.4	4.8	6.1
April	3.0	4.5	4.2	4.1	3.3	2.7	6.5	7.7	4.3	6.1
May	2.6	4.2	4.0	3.9	3.2	2.4	5.8	6.9	3.8	5.7
June	2.3	3.7	3.6	3.5	3.0	2.1	5.1	6.1	3.3	5.1
July	2.0	3.3	3.1	3.1	2.7	1.8	4.6	5.4	2.9	4.5
August	1.8	2.9	2.8	2.7	2.3	1.6	4.0	4.8	2.6	4.0
September	1.6	2.6	2.4	2.4	2.1	1.4	3.6	4.2	2.3	3.5
October	1.4	2.3	2.1	2.1	1.8	1.2	3.1	3.7	2.0	3.1
November	1.2	2.2	1.9	1.8	1.6	1.1	2.8	3.3	1.7	2.7
December	1.8	3.5	1.7	1.6	1.6	1.4	2.5	3.1	2.1	2.6

This concludes our analysis of the current project and technical reports that have become available for our review. Based on our further analysis of the project, FCE again concludes that the supporting technical information prepared by Questa Engineering, Inc. does not support the findings in the FEIR that the proposed project will not result in less than significant impacts to the environment.

Please note that the calculations performed by FCE during our analysis were conducted to support review of the technical work completed by Questa Engineering. FCE has not been retained to conduct a comprehensive study of the suitability of the site for the proposed use, but rather to review the technical adequacy of the work used to develop and support the EIR.

If you have any questions or comments, please do not hesitate to contact me at (831) 426-9054.

Sincerely,

PETER HAASE, P.E.
Principal Engineer

ATTACHMENT 1

```
******************************************************************************
******************************************************************************
**                                                                          **
**                                                                          **
**              HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE               **
**                HELP MODEL VERSION 3.07  (1 NOVEMBER 1997)                **
**                  DEVELOPED BY ENVIRONMENTAL LABORATORY                   **
**                    USAE WATERWAYS EXPERIMENT STATION                     **
**             FOR USEPA RISK REDUCTION ENGINEERING LABORATORY              **
**                                                                          **
**                                                                          **
******************************************************************************
******************************************************************************


PRECIPITATION DATA FILE:     C:\MYDOCU~1\ASE-DA~1\HELP3\pointr\33INX10.D4
TEMPERATURE DATA FILE:       C:\MYDOCU~1\ASE-DA~1\HELP3\pointr\33INX10.D7
SOLAR RADIATION DATA FILE:   C:\MYDOCU~1\ASE-DA~1\HELP3\pointr\33INX10.D13
EVAPOTRANSPIRATION DATA:     C:\MYDOCU~1\ASE-DA~1\HELP3\pointr\33INX10.D11
SOIL AND DESIGN DATA FILE:   C:\MYDOCU~1\ASE-DA~1\HELP3\pointr\DATA10.D10
OUTPUT DATA FILE:            C:\MYDOCU~1\ASE-DA~1\HELP3\pointr\runoff.OUT


TIME:  10: 6     DATE:   3/15/2002


******************************************************************************

     TITLE:  Point Reyes Affordable Housing Project

******************************************************************************


     NOTE:  INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
              COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.


                                  LAYER  1
                                  --------

                     TYPE 1 - VERTICAL PERCOLATION LAYER
                         MATERIAL TEXTURE NUMBER   7
          THICKNESS                    =     24.00   INCHES
          POROSITY                     =      0.4730 VOL/VOL
          FIELD CAPACITY               =      0.2220 VOL/VOL
          WILTING POINT                =      0.1040 VOL/VOL
          INITIAL SOIL WATER CONTENT   =      0.2274 VOL/VOL
          EFFECTIVE SAT. HYD. COND.    =  0.520000001000E-03 CM/SEC
        NOTE:  SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY  3.63
                 FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.
```

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 0

THICKNESS	=	72.00	INCHES
POROSITY	=	0.4730	VOL/VOL
FIELD CAPACITY	=	0.2220	VOL/VOL
WILTING POINT	=	0.1040	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2884	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.224000006000E-02	CM/SEC

LAYER 3

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 0

THICKNESS	=	12.00	INCHES
POROSITY	=	0.4370	VOL/VOL
FIELD CAPACITY	=	0.1050	VOL/VOL
WILTING POINT	=	0.0470	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4370	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.224000006000E-02	CM/SEC
SLOPE	=	4.00	PERCENT
DRAINAGE LENGTH	=	600.0	FEET

LAYER 4

TYPE 3 - BARRIER SOIL LINER
MATERIAL TEXTURE NUMBER 16

THICKNESS	=	36.00	INCHES
POROSITY	=	0.4270	VOL/VOL
FIELD CAPACITY	=	0.4180	VOL/VOL
WILTING POINT	=	0.3670	VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.4270	VOL/VOL
EFFECTIVE SAT. HYD. COND.	=	0.100000001000E-06	CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT SOIL DATA BASE USING SOIL TEXTURE # 7 WITH A FAIR STAND OF GRASS, A SURFACE SLOPE OF 4.% AND A SLOPE LENGTH OF 600. FEET.

SCS RUNOFF CURVE NUMBER	=	74.00	
FRACTION OF AREA ALLOWING RUNOFF	=	100.0	PERCENT
AREA PROJECTED ON HORIZONTAL PLANE	=	6.900	ACRES
EVAPORATIVE ZONE DEPTH	=	32.0	INCHES
INITIAL WATER IN EVAPORATIVE ZONE	=	7.573	INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE	=	15.136	INCHES
LOWER LIMIT OF EVAPORATIVE STORAGE	=	3.328	INCHES
INITIAL SNOW WATER	=	0.000	INCHES
INITIAL WATER IN LAYER MATERIALS	=	46.836	INCHES
TOTAL INITIAL WATER	=	46.836	INCHES
TOTAL SUBSURFACE INFLOW	=	0.00	INCHES/YEAR

EVAPOTRANSPIRATION AND WEATHER DATA

NOTE: EVAPOTRANSPIRATION DATA WAS OBTAINED FROM
SAN FRANCISCO CALIFORNIA

STATION LATITUDE	=	37.78 DEGREES
MAXIMUM LEAF AREA INDEX	=	2.50
START OF GROWING SEASON (JULIAN DATE)	=	305
END OF GROWING SEASON (JULIAN DATE)	=	151
EVAPORATIVE ZONE DEPTH	=	32.0 INCHES
AVERAGE ANNUAL WIND SPEED	=	10.50 MPH
AVERAGE 1ST QUARTER RELATIVE HUMIDITY	=	75.00 %
AVERAGE 2ND QUARTER RELATIVE HUMIDITY	=	71.00 %
AVERAGE 3RD QUARTER RELATIVE HUMIDITY	=	73.00 %
AVERAGE 4TH QUARTER RELATIVE HUMIDITY	=	74.00 %

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR SAN FRANCISCO CALIFORNIA

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
7.79	5.41	4.42	2.56	0.54	0.18
0.05	0.08	0.32	1.78	3.92	5.95

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR SAN FRANCISCO CALIFORNIA

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
48.50	51.60	52.80	54.80	57.80	60.80
62.20	63.00	63.90	60.60	54.50	49.20

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
COEFFICIENTS FOR SAN FRANCISCO CALIFORNIA
AND STATION LATITUDE = 37.78 DEGREES

MONTHLY TOTALS (IN INCHES) FOR YEAR 1

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	2.45	5.82	2.40	0.00	0.23	0.00
	0.00	0.00	0.42	0.67	4.56	8.91
RUNOFF	0.000	0.037	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.082	0.240
EVAPOTRANSPIRATION	1.763	2.293	3.238	1.527	0.280	0.018
	0.000	0.000	0.192	0.323	1.246	1.964
LATERAL DRAINAGE COLLECTED	0.7012	0.6573	0.9509	0.9083	0.8271	0.7052
FROM LAYER 3	0.6381	0.5597	0.4732	0.4260	0.3578	0.5661
PERCOLATION/LEAKAGE THROUGH	0.1838	0.1687	0.2117	0.2036	0.1979	0.1809
LAYER 4	0.1768	0.1680	0.1549	0.1531	0.1420	0.1687

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

AVERAGE DAILY HEAD ON	26.762	27.772	36.289	35.821	31.566	27.809
TOP OF LAYER 4	24.354	21.360	18.662	16.257	14.111	21.603
STD. DEVIATION OF DAILY	4.108	1.361	3.860	1.298	1.198	1.021
HEAD ON TOP OF LAYER 4	0.963	0.851	0.735	0.677	0.584	8.823

ANNUAL TOTALS FOR YEAR 1

	INCHES	CU. FEET	PERCENT
PRECIPITATION	25.46	637696.750	100.00
RUNOFF	0.359	8990.561	1.41
EVAPOTRANSPIRATION	12.845	321730.844	50.45
DRAINAGE COLLECTED FROM LAYER 3	7.7709	194638.906	30.52
PERC./LEAKAGE THROUGH LAYER 4	2.110235	52855.066	8.29
AVG. HEAD ON TOP OF LAYER 4	25.1973		
CHANGE IN WATER STORAGE	2.375	59481.465	9.33
SOIL WATER AT START OF YEAR	46.836	1173093.000	
SOIL WATER AT END OF YEAR	49.210	1232574.500	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.107	0.00

MONTHLY TOTALS (IN INCHES) FOR YEAR 2

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	8.66	1.31	6.01	3.09	0.32	0.57
	0.00	0.04	0.21	0.39	8.53	8.81
RUNOFF	0.215	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.174	0.002
EVAPOTRANSPIRATION	1.717	2.317	2.278	4.921	1.020	0.417
	0.326	0.063	0.090	0.174	2.045	1.763
LATERAL DRAINAGE COLLECTED	1.0515	1.3193	1.4211	1.3723	1.3295	1.1377
FROM LAYER 3	1.0385	0.9145	0.7825	0.7112	0.6643	1.0888
PERCOLATION/LEAKAGE THROUGH	0.2230	0.2427	0.2643	0.2554	0.2541	0.2292
LAYER 4	0.2215	0.2077	0.1895	0.1849	0.1763	0.2272

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

AVERAGE DAILY HEAD ON	40.130	55.743	54.233	54.117	50.737	44.867
TOP OF LAYER 4	39.634	34.900	30.857	27.142	26.198	41.553
STD. DEVIATION OF DAILY	3.354	1.227	1.548	1.298	1.851	1.599
HEAD ON TOP OF LAYER 4	1.473	1.300	1.134	1.041	4.088	6.207

ANNUAL TOTALS FOR YEAR 2

	INCHES	CU. FEET	PERCENT
PRECIPITATION	37.94	950283.062	100.00
RUNOFF	0.392	9807.746	1.03
EVAPOTRANSPIRATION	17.131	429079.875	45.15
DRAINAGE COLLECTED FROM LAYER 3	12.8310	321378.094	33.82
PERC./LEAKAGE THROUGH LAYER 4	2.675879	67022.727	7.05
AVG. HEAD ON TOP OF LAYER 4	41.6759		
CHANGE IN WATER STORAGE	4.911	122994.430	12.94
SOIL WATER AT START OF YEAR	49.210	1232574.500	
SOIL WATER AT END OF YEAR	54.121	1355569.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.173	0.00

****

MONTHLY TOTALS (IN INCHES) FOR YEAR 3

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	2.70	3.63	2.26	5.45	0.55	0.00
	0.00	0.00	0.00	0.91	1.92	8.04
RUNOFF	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
EVAPOTRANSPIRATION	1.999	2.518	2.620	4.576	1.681	0.100
	0.000	0.000	0.000	0.905	1.473	1.691
LATERAL DRAINAGE COLLECTED	1.4311	1.3452	1.4676	1.2749	1.2569	1.0819
FROM LAYER 3	0.9871	0.8685	0.7398	0.6698	0.5701	0.5177
PERCOLATION/LEAKAGE THROUGH	0.2654	0.2456	0.2695	0.2446	0.2460	0.2230
LAYER 4	0.2158	0.2025	0.1847	0.1803	0.1658	0.1633

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

AVERAGE DAILY HEAD ON	54.617	56.838	56.010	50.277	47.970	42.668
TOP OF LAYER 4	37.672	33.145	29.175	25.560	22.484	19.757
STD. DEVIATION OF DAILY	2.027	0.891	1.564	1.369	1.390	1.526
HEAD ON TOP OF LAYER 4	1.406	1.252	1.081	1.098	0.860	0.684

****

****

ANNUAL TOTALS FOR YEAR 3

	INCHES	CU. FEET	PERCENT
PRECIPITATION	25.46	637696.625	100.00
RUNOFF	0.000	0.000	0.00
EVAPOTRANSPIRATION	17.563	439891.719	68.98
DRAINAGE COLLECTED FROM LAYER 3	12.2107	305841.281	47.96
PERC./LEAKAGE THROUGH LAYER 4	2.606536	65285.898	10.24
AVG. HEAD ON TOP OF LAYER 4	39.6812		
CHANGE IN WATER STORAGE	-6.920	-173322.328	-27.18
SOIL WATER AT START OF YEAR	54.121	1355569.000	
SOIL WATER AT END OF YEAR	47.201	1182246.620	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.078	0.00

****

****

MONTHLY TOTALS (IN INCHES) FOR YEAR 4

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	3.76	6.47	6.77	4.27	0.00	0.25
	0.03	0.39	0.00	0.70	1.89	3.74
RUNOFF	0.002	0.205	0.015	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.039
EVAPOTRANSPIRATION	1.874	2.287	3.339	4.983	3.116	0.198
	0.082	0.161	0.226	0.104	1.542	1.495
LATERAL DRAINAGE COLLECTED	0.8463	0.8831	1.0996	1.2475	1.2265	1.0537
FROM LAYER 3	0.9611	0.8453	0.7198	0.6513	0.5542	0.5006
PERCOLATION/LEAKAGE THROUGH	0.2001	0.1974	0.2284	0.2415	0.2426	0.2198
LAYER 4	0.2129	0.1999	0.1825	0.1783	0.1640	0.1614

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

AVERAGE DAILY HEAD ON	32.299	36.028	41.966	49.196	46.808	41.554
TOP OF LAYER 4	36.678	32.260	28.386	24.858	21.856	19.107
STD. DEVIATION OF DAILY	7.024	0.991	2.557	0.548	1.459	1.489
HEAD ON TOP OF LAYER 4	1.372	1.222	1.055	1.022	0.840	0.774

****

****

ANNUAL TOTALS FOR YEAR 4

	INCHES	CU. FEET	PERCENT
PRECIPITATION	28.27	708078.875	100.00
RUNOFF	0.262	6560.592	0.93
EVAPOTRANSPIRATION	19.405	486048.312	68.64
DRAINAGE COLLECTED FROM LAYER 3	10.5891	265225.531	37.46
PERC./LEAKAGE THROUGH LAYER 4	2.428669	60830.867	8.59
AVG. HEAD ON TOP OF LAYER 4	34.2496		
CHANGE IN WATER STORAGE	-4.415	-110586.258	-15.62
SOIL WATER AT START OF YEAR	47.201	1182246.620	
SOIL WATER AT END OF YEAR	42.786	1071660.370	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.155	0.00

****

****

MONTHLY TOTALS (IN INCHES) FOR YEAR 5

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	6.01	3.26	7.17	5.20	1.73	0.07
	0.00	0.00	1.64	0.06	2.73	8.44
RUNOFF	0.031	0.054	0.003	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.036
EVAPOTRANSPIRATION	1.597	2.166	3.178	4.550	3.579	0.119
	0.025	0.000	0.123	1.547	0.798	1.866
LATERAL DRAINAGE COLLECTED	0.4544	0.6221	0.8811	0.9944	1.0194	0.9170
FROM LAYER 3	0.8391	0.7370	0.6243	0.5678	0.4811	0.4951
PERCOLATION/LEAKAGE THROUGH	0.1562	0.1648	0.2039	0.2132	0.2194	0.2046
LAYER 4	0.1992	0.1878	0.1718	0.1689	0.1558	0.1608

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

AVERAGE DAILY HEAD ON	17.341	26.286	33.627	39.214	38.906	36.163
TOP OF LAYER 4	32.023	28.126	24.621	21.670	18.973	18.894
STD. DEVIATION OF DAILY	0.963	5.258	1.479	0.417	0.275	1.304
HEAD ON TOP OF LAYER 4	1.195	1.081	0.966	0.861	0.737	4.511

****

****

ANNUAL TOTALS FOR YEAR 5

	INCHES	CU. FEET	PERCENT
PRECIPITATION	36.31	909456.500	100.00
RUNOFF	0.125	3124.693	0.34
EVAPOTRANSPIRATION	19.547	489599.844	53.83
DRAINAGE COLLECTED FROM LAYER 3	8.6328	216225.859	23.78
PERC./LEAKAGE THROUGH LAYER 4	2.206578	55268.172	6.08
AVG. HEAD ON TOP OF LAYER 4	27.9870		
CHANGE IN WATER STORAGE	5.799	145238.187	15.97
SOIL WATER AT START OF YEAR	42.786	1071660.370	
SOIL WATER AT END OF YEAR	48.585	1216898.500	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.251	0.00

****

****

MONTHLY TOTALS (IN INCHES) FOR YEAR 6

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	3.79	2.19	2.37	1.62	0.70	0.21
	0.25	0.00	0.00	0.14	4.85	8.31
RUNOFF	0.000	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.050
EVAPOTRANSPIRATION	1.755	2.503	3.227	2.933	0.949	0.182
	0.237	0.040	0.000	0.107	2.069	1.808
LATERAL DRAINAGE COLLECTED	1.0610	0.9842	0.9704	0.8278	0.7528	0.6379
FROM LAYER 3	0.5799	0.5060	0.4269	0.3833	0.3211	0.4390
PERCOLATION/LEAKAGE THROUGH	0.2241	0.2053	0.2139	0.1946	0.1896	0.1734
LAYER 4	0.1703	0.1620	0.1498	0.1483	0.1379	0.1545

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

AVERAGE DAILY HEAD ON	40.493	41.584	37.034	32.644	28.730	25.158
TOP OF LAYER 4	22.133	19.311	16.835	14.627	12.663	16.753
STD. DEVIATION OF DAILY	3.667	1.153	1.384	1.196	1.102	1.032
HEAD ON TOP OF LAYER 4	0.877	0.781	0.674	0.621	0.530	5.298

****

****

ANNUAL TOTALS FOR YEAR 6

	INCHES	CU. FEET	PERCENT
PRECIPITATION	24.43	611898.312	100.00
RUNOFF	0.050	1249.353	0.20
EVAPOTRANSPIRATION	15.810	396005.375	64.72
DRAINAGE COLLECTED FROM LAYER 3	7.8903	197627.859	32.30
PERC./LEAKAGE THROUGH LAYER 4	2.123575	53189.184	8.69
AVG. HEAD ON TOP OF LAYER 4	25.6638		
CHANGE IN WATER STORAGE	-1.444	-36173.605	-5.91
SOIL WATER AT START OF YEAR	48.585	1216898.500	
SOIL WATER AT END OF YEAR	47.140	1180725.000	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.155	0.00

****

MONTHLY TOTALS (IN INCHES) FOR YEAR 7

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	17.01	7.78	4.34	3.95	0.67	0.26
	0.00	0.00	0.00	0.95	4.59	6.95
RUNOFF	2.829	0.259	0.040	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.000
EVAPOTRANSPIRATION	1.855	2.215	3.699	4.848	2.476	0.015
	0.246	0.000	0.000	0.303	1.806	1.891
LATERAL DRAINAGE COLLECTED	0.9882	1.8654	2.2656	2.0156	1.8328	1.5631
FROM LAYER 3	1.4317	1.2643	1.0815	0.9867	0.8418	0.7874
PERCOLATION/LEAKAGE THROUGH	0.2159	0.3059	0.3602	0.3246	0.3093	0.2766
LAYER 4	0.2655	0.2468	0.2229	0.2157	0.1962	0.1935

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

AVERAGE DAILY HEAD ON	37.701	79.621	86.970	78.530	69.602	61.594
TOP OF LAYER 4	54.639	48.252	42.650	37.656	33.199	30.051
STD. DEVIATION OF DAILY	11.493	9.828	2.222	2.747	2.504	2.036
HEAD ON TOP OF LAYER 4	1.984	1.766	1.526	1.406	1.214	1.435

ANNUAL TOTALS FOR YEAR 7

	INCHES	CU. FEET	PERCENT
PRECIPITATION	46.50	1164685.500	100.00
RUNOFF	3.128	78342.586	6.73
EVAPOTRANSPIRATION	19.354	484755.531	41.62
DRAINAGE COLLECTED FROM LAYER 3	16.9240	423895.844	36.40
PERC./LEAKAGE THROUGH LAYER 4	3.133137	78475.687	6.74
AVG. HEAD ON TOP OF LAYER 4	55.0388		
CHANGE IN WATER STORAGE	3.961	99215.906	8.52
SOIL WATER AT START OF YEAR	47.140	1180725.000	
SOIL WATER AT END OF YEAR	51.102	1279940.870	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.066	0.00

****

MONTHLY TOTALS (IN INCHES) FOR YEAR 8

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	12.60	8.90	6.11	4.38	0.00	0.23
	0.00	0.35	0.05	2.99	1.41	8.73
RUNOFF	0.225	0.006	0.382	0.019	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.797
EVAPOTRANSPIRATION	1.872	2.550	3.647	5.004	0.942	0.230
	0.000	0.238	0.117	2.460	1.193	1.329
LATERAL DRAINAGE COLLECTED	1.6912	2.1291	2.5578	2.2757	2.1828	1.8711
FROM LAYER 3	1.7025	1.5045	1.2888	1.1780	1.0071	0.9821
PERCOLATION/LEAKAGE THROUGH	0.2933	0.3411	0.4010	0.3651	0.3474	0.3096
LAYER 4	0.2954	0.2736	0.2461	0.2371	0.2146	0.2152

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

AVERAGE DAILY HEAD ON	64.124	88.469	100.889	92.787	82.592	73.218
TOP OF LAYER 4	64.839	57.413	50.827	44.956	39.716	37.480
STD. DEVIATION OF DAILY	14.339	7.405	2.615	2.280	3.007	2.529
HEAD ON TOP OF LAYER 4	2.362	2.078	1.790	1.654	1.423	3.674

****

****

ANNUAL TOTALS FOR YEAR 8

	INCHES	CU. FEET	PERCENT
PRECIPITATION	45.75	1145900.370	100.00
RUNOFF	1.428	35771.793	3.12
EVAPOTRANSPIRATION	19.583	490490.062	42.80
DRAINAGE COLLECTED FROM LAYER 3	20.3706	510223.469	44.53
PERC./LEAKAGE THROUGH LAYER 4	3.539387	88651.031	7.74
AVG. HEAD ON TOP OF LAYER 4	66.4425		
CHANGE IN WATER STORAGE	0.829	20763.641	1.81
SOIL WATER AT START OF YEAR	51.102	1279940.870	
SOIL WATER AT END OF YEAR	51.931	1300704.500	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	0.364	0.00

****

****

MONTHLY TOTALS (IN INCHES) FOR YEAR 9

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	6.86	1.85	0.50	0.81	0.41	0.00
	0.00	0.00	0.00	0.66	4.31	9.95
RUNOFF	0.030	0.000	0.000	0.000	0.000	0.000
	0.000	0.000	0.000	0.000	0.146	0.464
EVAPOTRANSPIRATION	1.811	2.507	1.500	1.892	0.756	0.000
	0.000	0.000	0.000	0.084	1.892	1.504
LATERAL DRAINAGE COLLECTED	1.3901	1.4202	1.4961	1.2948	1.1868	1.0146
FROM LAYER 3	0.9250	0.8132	0.6921	0.6259	0.5321	0.6603
PERCOLATION/LEAKAGE THROUGH	0.2608	0.2540	0.2727	0.2468	0.2381	0.2155
LAYER 4	0.2088	0.1963	0.1794	0.1754	0.1615	0.1793

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

AVERAGE DAILY HEAD ON	53.050	59.995	57.096	51.061	45.291	40.010
TOP OF LAYER 4	35.301	31.034	27.292	23.885	20.986	25.199
STD. DEVIATION OF DAILY	4.626	0.510	1.560	1.688	1.665	1.438
HEAD ON TOP OF LAYER 4	1.325	1.180	1.019	0.910	0.811	8.989

****

****

ANNUAL TOTALS FOR YEAR 9

	INCHES	CU. FEET	PERCENT
PRECIPITATION	25.35	634941.437	100.00
RUNOFF	0.640	16035.354	2.53
EVAPOTRANSPIRATION	11.945	299195.469	47.12
DRAINAGE COLLECTED FROM LAYER 3	12.0510	301842.500	47.54
PERC./LEAKAGE THROUGH LAYER 4	2.588646	64837.820	10.21
AVG. HEAD ON TOP OF LAYER 4	39.1835		
CHANGE IN WATER STORAGE	-1.875	-46969.621	-7.40
SOIL WATER AT START OF YEAR	51.931	1300704.500	
SOIL WATER AT END OF YEAR	50.055	1253734.870	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.113	0.00

****

****

MONTHLY TOTALS (IN INCHES) FOR YEAR 10

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION	12.03	5.90	2.71	5.68	0.85	0.02
	0.05	0.02	0.00	3.36	0.41	9.33
RUNOFF	0.632	0.091	0.000	0.234	0.000	0.000
	0.000	0.000	0.000	0.000	0.000	0.025
EVAPOTRANSPIRATION	1.776	2.278	3.396	4.778	1.356	0.378
	0.198	0.020	0.000	2.118	1.445	1.630
LATERAL DRAINAGE COLLECTED	1.6308	1.7703	1.9489	1.8766	1.8063	1.5442
FROM LAYER 3	1.4137	1.2483	1.0677	0.9739	0.8308	0.8200
PERCOLATION/LEAKAGE THROUGH	0.2866	0.2915	0.3215	0.3102	0.3065	0.2746
LAYER 4	0.2635	0.2450	0.2214	0.2143	0.1949	0.1971

MONTHLY SUMMARIES FOR DAILY HEADS (INCHES)

AVERAGE DAILY HEAD ON	61.860	74.171	73.775	73.423	68.638	60.862
TOP OF LAYER 4	53.951	47.640	42.104	37.170	32.765	31.294
STD. DEVIATION OF DAILY	15.327	1.026	1.358	1.974	2.503	2.046
HEAD ON TOP OF LAYER 4	1.961	1.745	1.508	1.389	1.200	3.298

****

****

ANNUAL TOTALS FOR YEAR 10

	INCHES	CU. FEET	PERCENT
PRECIPITATION	40.36	1010896.940	100.00
RUNOFF	0.982	24590.809	2.43
EVAPOTRANSPIRATION	19.371	485191.594	48.00
DRAINAGE COLLECTED FROM LAYER 3	16.9313	424078.625	41.95
PERC./LEAKAGE THROUGH LAYER 4	3.127091	78324.242	7.75
AVG. HEAD ON TOP OF LAYER 4	54.8044		
CHANGE IN WATER STORAGE	-0.051	-1288.161	-0.13
SOIL WATER AT START OF YEAR	50.055	1253734.870	
SOIL WATER AT END OF YEAR	50.004	1252446.750	
SNOW WATER AT START OF YEAR	0.000	0.000	0.00
SNOW WATER AT END OF YEAR	0.000	0.000	0.00
ANNUAL WATER BUDGET BALANCE	0.0000	-0.191	0.00

****

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 10

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
PRECIPITATION						
TOTALS	7.59	4.71	4.06	3.45	0.55	0.16
	0.03	0.08	0.23	1.08	3.52	8.12
STD. DEVIATIONS	4.91	2.63	2.32	2.00	0.51	0.18
	0.08	0.15	0.51	1.14	2.35	1.73
RUNOFF						
TOTALS	0.396	0.065	0.044	0.025	0.000	0.000
	0.000	0.000	0.000	0.000	0.040	0.165
STD. DEVIATIONS	0.877	0.094	0.119	0.074	0.000	0.000
	0.000	0.000	0.000	0.000	0.068	0.267
EVAPOTRANSPIRATION						
TOTALS	1.802	2.363	3.012	4.001	1.615	0.166
	0.111	0.052	0.075	0.812	1.551	1.694
STD. DEVIATIONS	0.108	0.141	0.686	1.353	1.090	0.146
	0.127	0.083	0.088	0.907	0.408	0.203
LATERAL DRAINAGE COLLECTED FROM LAYER 3						
TOTALS	1.1246	1.2996	1.5059	1.4088	1.3421	1.1526
	1.0517	0.9261	0.7897	0.7174	0.6161	0.6857
STD. DEVIATIONS	0.4049	0.5155	0.5811	0.4895	0.4624	0.3934
	0.3600	0.3201	0.2764	0.2548	0.2204	0.2244
PERCOLATION/LEAKAGE THROUGH LAYER 4						
TOTALS	0.2309	0.2417	0.2747	0.2600	0.2551	0.2307
	0.2230	0.2090	0.1903	0.1856	0.1709	0.1821
STD. DEVIATIONS	0.0449	0.0589	0.0670	0.0559	0.0511	0.0436
	0.0402	0.0358	0.0309	0.0285	0.0246	0.0251

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 4						
AVERAGES	42.8378	54.6507	57.7889	55.7071	51.0840	45.3903
	40.1224	35.3442	31.1410	27.3783	24.2950	26.1691
STD. DEVIATIONS	15.3361	21.6726	22.8720	19.7344	17.4307	15.3886
	13.7116	12.2141	10.9008	9.7254	8.6920	8.5654

****

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 10

	INCHES		CU. FEET	PERCENT
PRECIPITATION	33.58	(8.813)	841153.4	100.00
RUNOFF	0.737	(0.9511)	18447.35	2.193
EVAPOTRANSPIRATION	17.256	(2.8678)	432198.87	51.382
LATERAL DRAINAGE COLLECTED FROM LAYER 3	12.62019	(4.26388)	316097.812	37.57909
PERCOLATION/LEAKAGE THROUGH LAYER 4	2.65397	(0.47985)	66474.062	7.90273
AVERAGE HEAD ON TOP OF LAYER 4	40.992	(13.906)		
CHANGE IN WATER STORAGE	0.317	(4.1060)	7935.37	0.943

****
****

PEAK DAILY VALUES FOR YEARS 1 THROUGH 10

	(INCHES)	(CU. FT.)
PRECIPITATION	6.31	158046.578
RUNOFF	2.625	65758.9297
DRAINAGE COLLECTED FROM LAYER 3	0.08668	2171.00317
PERCOLATION/LEAKAGE THROUGH LAYER 4	0.013381	335.14890
AVERAGE HEAD ON TOP OF LAYER 4	105.616	
MAXIMUM HEAD ON TOP OF LAYER 4	129.900	
LOCATION OF MAXIMUM HEAD IN LAYER 3 (DISTANCE FROM DRAIN)	249.2 FEET	
SNOW WATER	0.01	258.3588
MAXIMUM VEG. SOIL WATER (VOL/VOL)	0.4573	
MINIMUM VEG. SOIL WATER (VOL/VOL)	0.1040	

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner
by Bruce M. McEnroe, University of Kansas
ASCE Journal of Environmental Engineering
Vol. 119, No. 2, March 1993, pp. 262-270.

****

****

FINAL WATER STORAGE AT END OF YEAR 10

LAYER	(INCHES)	(VOL/VOL)
1	6.3220	0.2634
2	23.0659	0.3204
3	5.2440	0.4370
4	15.3720	0.4270
SNOW WATER	0.000	

****
****

California Regional Water Quality Control Board
San Francisco Bay Region

Winston H. Hickox
Secretary for Environmental Protection

1515 Clay Street, Suite 1400, Oakland, California 94612
Phone (510) 622-2300 ∃ Fax (510) 622-2460
Internet Address: http://www.swrcb.ca.gov

Gray Davis
Governor

March 18, 2002
File No. 2158.06 (BDA)

Mr. Thomas Lai
Principal Planner
Marin County Community Development Agency
3501 Civic Center Drive, Room 308
San Rafael, CA 94903

SUBJECT: Request to Modify Conditions of Approval for the Point Reyes Affordable Homes Project, Point Reyes Station, Marin County

Dear Mr. Lai:

The purpose of this letter is to provide comments regarding the subject project, and in particular the wastewater and storm water systems for the project. We understand that the Marin County Planning Commission recommended approval of the project to the County Board of Supervisors, and that the Board of Supervisors has scheduled the project for consideration on March 19, 2002.

We have concerns about protection of water quality for water resources at and within the vicinity of the project, and adequate protection of beneficial uses of these waters. Water resources of concern include groundwater, wetlands on-site and off-site, Lagunitas Creek, and Tomales Bay. Lagunitas Creek and Tomales Bay are both listed as impaired by pathogens, nutrients, and sediment on the State's impaired waterbody list.

Based on our review of the information provided regarding the wastewater and storm water systems for the project, we find that there are unresolved uncertainties regarding these systems and associated potential adverse impacts to water resources. Uncertainties that we feel have not been adequately resolved include adequate depth of unsaturated soil beneath the wastewater systems, nutrient loading to groundwater, nutrient loading to offsite wetlands and Lagunitas Creek, interactive hydrologic effects between the on-site storm water control systems and the on-site waster systems, appropriate operation maintenance and monitoring of the wastewater and storm water systems and monitoring of ambient conditions to ensure proper performance and compliance with design criteria, funding to ensure proper operation maintenance and monitoring of these systems, and long-term oversight of the on-site wastewater systems by the County.

Normally, we would request that the project applicant submit a Report of Waste Discharge to the Regional Board that addresses such uncertainities. However, given the permitting progress the County has made on the project, we will not request a Report of Waste Discharge if the County modifies its proposed Conditions of Approval for the project, as described below.

BOS ATTACHMENT #9

EXHIBIT D

Conditions of Approval – Regional Board Requested Modifications

1. Storm Water Control Practices During Construction

Condition 44 addresses measures to control soil erosion and storm water runoff related impacts during construction. The Conditions of Approval do not address the need for compliance with the statewide NPDES General Permit for Storm Water Discharges Associated with Construction Activity. The proposed development must comply with the requirements of this Permit.

We request that the Condition 44 be modified to require that, prior to approval of a subdivision improvement agreement or issuance of a grading permit, the applicant also be required to file a Notice of Intent to Comply with the statewide NPDES General Permit for Storm Water Discharges Associated with Construction Activity.

2. Wetlands Disturbance and Mitigation

Condition 19 discusses on-site wetland compensation for disturbance within the 100-foot wetland buffer area that may occur as part of the project development. The condition requires submittal of a plan with recommendations for wetland enhancement measures. The Conditions of Approval do not require implementation of measures identified by such plan. Also, the Conditions of Approval do not address development or implementation of measures to monitor the success of such recommended or proposed wetland enhancement measures, nor requirements for the success of such measures.

We request that the Condition 19 be modified to require, in addition to submittal of a plan, implementation of the measures identified in the plan, or other measures determined to be necessary to provide adequate compensation for wetland buffer area disturbances, and monitoring to ensure the success of such measures.

3. Long-term Protection of Existing On-Site Wetlands

The Conditions of Approval include measures intended to avoid direct impacts to the existing on-site wetlands, and provide protection for these wetlands. Conditions 5A and 17A address establishment of a conservation easement and 100 foot buffer areas around the wetland areas. Condition 16 addresses development of a plan for monitoring measures to be undertaken during construction to minimize construction impacts. The Conditions do not address plans and measures for long-term management, monitoring and protection of the wetland areas. Avoidance of direct impacts to wetlands such as by precluding development in the wetlands and within a 100 foot buffer area around the wetlands is acceptable and desirable. However, adverse impacts to the wetlands could occur after the project's development, such as from direct access or migration of people or domestic animals through the wetlands. Similarly, the proposed storm water drainage and control system that relies heavily on storm water infiltration in and around the wetland areas may impact these areas. Finally, Condition 16 requires submittal of a monitoring plan, but does not require actual implementation of the measures identified in such plan.

03/18/2002 MON 20:53 [TX/RX NO 5883] ☑002

We request that the Conditions of Approval be modified to require that, prior to approval of a subdivision improvement agreement or issuance of a grading permit, the applicant develop a plan for long-term protection of the wetlands, acceptable to the Regional Board Executive Officer. This plan should include measures to preclude adverse impacts to the wetlands that may be associated with occupancy and use of the proposed development, monitoring the conditions of the wetlands, and contingency measures to be taken in the event that the wetlands are adversely impacted, in the future.

4. Storm Water System Operation and Maintenance

The Conditions of Approval include conditions that address the proposed storm water drainage and control system. These include Condition 43, which addresses criteria for the storm water system design, and Condition 49, which requires submittal of a maintenance agreement. The proposed storm water drainage and control system is a complex system that will require proper operation and maintenance in order to achieve design objectives.

We request that the Conditions of Approval be modified to require that, prior to approval of a subdivision improvement agreement or issuance of a grading permit, the applicant develop an Operation, Maintenance and Monitoring Plan for the proposed storm water systems, acceptable to the Regional Board Executive Officer. This Plan should include identification of who will be responsible for maintaining the storm water systems, and the means to assuring necessary funding to conduct necessary operation, maintenance and monitoring activities.

5. Wastewater System Design and Adequacy

Based on our review of the information provided about the proposed wastewater systems, we have uncertainty about the adequacy of the proposed system, both in terms of compliance with the County's regulations for on-site wastewater systems and with respect to providing adequate protection of beneficial uses of waters of the State.

We request that the Conditions of Approval be modified to include conditions which require that adequate and reliable wastewater service for all land parcels and development proposed as part of the project shall be demonstrated prior to recordation of the final map. This should include documentation of compliance with County regulations for on-site wastewater systems, for all components and aspects of the designs, and written approval from Marin County Environmental Health Services (MCEHS) that the proposed designs comply with all County regulations. This should also include that the proposed designs, documentation of compliance with County regulations and written approval by MCEHS shall be submitted to the Regional Board for review and approval by the Regional Board Executive Officer.

6. Wastewater Systems Permitting

Condition 54 identifies that the applicant shall obtain the necessary construction permits for the septic systems and comply with all permitting conditions related to the permits. The Conditions of Approval do not address the applicant obtaining, or MCEHS issuing, operating permits for the wastewater systems. Overall, the proposed wastewater system for the project is a complex system, comprised of twelve separate systems, with each of these systems comprised of multiple

03/18/2002 MON 20:53 [TX/RX NO 5883] 003

components. Given the complexity of the project as a whole, as well as the individual systems, it will be critical that each system is properly operated and maintained. In order to ensure adequate and reliable wastewater treatment and dispersal practices, and proper operation and maintenance, the systems should be permitted by means of renewable operating permits issued by MCEHS, not simply by construction permits.

We request that the Conditions of Approval be modified to include conditions which require, for each separate on-site water system included in the project, prior to issuance of a building permit, either a renewable operating permit issued by MCEHS, or Waste Discharge Requirements or waiver thereof issued by the Regional Board.

7. Wastewater Systems Operation, Maintenance and Monitoring

As noted above, the proposed on-site wastewater system for the project is a complex system. Proper operation and maintenance of the entire system and all subsystems is essential. Condition 55 requires, "in addition to standard requirements for routine inspection and maintenance, a monitoring and contingency plan". This condition is not sufficient. First, 'routine inspection and maintenance' activities are not described or referenced. Second, the condition addresses a plan for monitoring and contingency, but does not address operation and maintenance activities. Third, the condition does not require implementation of the plan. Fourth, the condition does not identify who will be responsible for implementing the plans, and how the activities identified in the plans will be financed.

We request that the Conditions of Approval be modified to require, for each on-site wastewater system included in the project, prior to issuance of a building permit, a complete Operation, Maintenance and Monitoring (OMM) Program, and a Contingency Plan. The OMM Program should include complete description of all equipment and components of the system, description of how the system and relevant individual components are intended to work, and all activities needed or recommended in order to ensure proper system performance. In addition, the OMM Program should identify procedures for conducting monitoring of ground water quality upslope, within and downslope of the project site, and other ambient conditions (e.g., rainfall and ground water levels) in order to demonstrate compliance with original wastewater system design criteria. The Contingency Plan should include actions to be taken in the event of malfunctioning equipment or system, of unexpected problems, or that the system does not comply with design criteria or ambient condition criteria. The OMM Program and the Contingency Plan should identify the responsible party for the system, how identified OMM actions will be implemented and how identified OMM and Contingency Plan actions will be funded. The OMM Program and the Contingency Plan shall be acceptable to the Regional Board Executive Officer.

Summary

The project proposes development on a site with significant environmental constraints, and proximity to sensitive water resources including groundwater, on-site seasonal wetlands, downstream riparian wetlands, Lagunitas Creek, and Tomales Bay. The proposed development includes a complex mix of on-site storm water control systems and on-site wastewater systems.

03/18/2002 MON 20:53 [TX/RX NO 5883] ☑004

Based on our review of the proposed storm water and wastewater systems, we find that there are unresolved uncertainties including potential inadequate protection of beneficial uses of waters of the State. By modifying the project's proposed Conditions of Approval as indicated, we feel that beneficial uses of waters of the State will be protected, such that it will not be necessary for the Regional Board to request of Report of Waste Discharge for the project.

If you have any questions about this matter, please contact me at (510) 622 – 2443, or Blair Allen of my staff at (510) 622 – 2305.

Sincerely,

Bruce Wolfe

Bruce Wolfe, Chief
Watershed Management Division

cc: Supervisor Kinsey

** TOTAL PAGE.05 **
03/18/2002 MON 20:53 [TX/RX NO 5883] 005

TATE OF CALIFORNIA —THE RESOURCES AGENCY

GRAY DAVIS, *Governor*

CALIFORNIA COASTAL COM. SSION

ORTH CENTRAL COAST DISTRICT OFFICE
5 FREMONT, SUITE 2000
AN FRANCISCO, CA 94105-2219
15) 904-5260

COMMISSION NOTIFICATION OF APPEAL

DATE: April 10, 2002

TO: Tom Lai, Senior Planner
County of Marin, Community Development Agency
3501 Civic Center Drive, #308
San Rafael, CA 94903-4157

FROM: Sarah Borchelt, Coastal Program Analyst *Sarah Borchelt*

RE: **Commission Appeal No. A-2-MAR-02-009**

Please be advised that the coastal development permit decision described below has been appealed to the California Coastal Commission pursuant to Public Resources Code Section 30602 or 30625. Therefore, the decision has been stayed pending Commission action on the appeal pursuant to Public Resources Code Section 30623.

Local Permit #:	CP 00-28
Applicant(s):	Point Reyes Affordable Homes, Inc., Attn: Lamar Turner
Description:	For the development of a 36-unit mixed-residential project on an 18.6 acre property and a barn.
Location:	857 Mesa Road, Point Reyes Station (Marin County) (APN(s) 119-240-45, 119-240-46, 119-240-57, 119-240-58)
Local Decision:	Approved w/ Conditions
Appellant(s):	County Of Sonoma, Attn: Mike Riley; Christina L. Desser
Date Appeal Filed:	4/10/2002

The Commission appeal number assigned to this appeal is A-2-MAR-02-009. The Commission hearing date has been tentatively set for May 7-10, 2002 in Santa Rosa. Within 5 working days of receipt of this Commission Notification of Appeal, copies of all relevant documents and materials used in the County of Marin's consideration of this coastal development permit must be delivered to the North Central Coast District office of the Coastal Commission (California Administrative Code Section 13112). Please include copies of plans, relevant photographs, staff reports and related documents, findings (if not already forwarded), all correspondence, and a list, with addresses, of all who provided verbal testimony.

A Commission staff report and notice of the hearing will be forwarded to you prior to the hearing. If you have any questions, please contact Sarah Borchelt at the North Central Coast District office.

EXHIBIT NO. 8
APPLICATION NO. A-2-MAR-02-009
POINT REYES AFFORDABLE HOUSING INC.
(Page 1 of 9)

STATE OF CALIFORNIA—THE RESOURCES AGENCY

GRAY DAVIS, GOVERNOR

CALIFORNIA COASTAL COMMISSION

45 FREMONT, SUITE 2000
SAN FRANCISCO, CA 94105-2219
VOICE AND TDD (415) 904-5200
FAX (415) 904-5400

RECEIVED
APR 10 2002
CALIFORNIA
COASTAL COMMISSION

APPEAL FROM COASTAL PERMIT DECISION OF LOCAL GOVERNMENT

Please Review Attached Appeal Information Sheet Prior To Completing This Form.

SECTION I. Appellant(s)

Name, mailing address and telephone number of appellant(s):

Christina L. Desser
2151 Pacific Street
San Francisco, CA 94115 (415) 561-2627
Zip Area Code Phone No.

SECTION II. Decision Being Appealed

1. Name of local/port government: Marin County

2. Brief description of development being appealed: See attached.

3. Development's location (street address, assessor's parcel no., cross street, etc.): 857 Mesa Road, Pt. Reyes Station, Marin County

4. Description of decision being appealed:

a. Approval; no special conditions: _____

b. Approval with special conditions: x

c. Denial: _____

Note: For jurisdictions with a total LCP, denial decisions by a local government cannot be appealed unless the development is a major energy or public works project. Denial decisions by port governments are not appealable.

TO BE COMPLETED BY COMMISSION:

APPEAL NO: A-2-MAR-02-009

DATE FILED: 4/10/02

DISTRICT: North Central Coast District

H5: 4/88

5. Decision being appealed was made by (check one):

a. __Planning Director/Zoning Administrator

b. x City Council/Board of Supervisors

c. __Planning Commission

d. __Other_____

6. Date of local government's decision: _____

7. Local government's file number (if any): _____

SECTION III. Identification of Other Interested Persons

Give the names and addresses of the following parties. (Use additional paper as necessary.)

a. Name and mailing address of permit applicant:
Point Reyes Affordable Homes, Inc., Attn: Lamar Turner
2169 East Francis Boulevard, Suite B
San Rafael, CA 94901

b. Names and mailing addresses as available of those who testified (either verbally or in writing) at the city/county/port hearing(s). Include other parties which you know to be interested and should receive notice of this appeal.

(1) _____

(2) _____

(3) _____

(4) _____

SECTION IV. Reasons Supporting This Appeal

Note: Appeals of local government coastal permit decisions are limited by a variety of factors and requirements of the Coastal Act. Please review the appeal information sheet for assistance in completing this section, which continues on the next page.

State briefly your reasons for this appeal. Include a summary description of Local Coastal Program, Land Use Plan, or Port Master Plan policies and requirements in which you believe the project is inconsistent and the reasons the decision warrants a new hearing. (Use additional paper as necessary.)

SEE ATTACHED.

Note: The above description need not be a complete or exhaustive statement of your reasons of appeal; however, there must be sufficient discussion for staff to determine that the appeal is allowed by law. The appellant, subsequent to filing the appeal, may submit additional information to the staff and/or Commission to support the appeal request.

SECTION V. Certification

The information and facts stated above are correct to the best of my/our knowledge.

Signed: Christina L. Desser
Appellant or Agent Christina L. Desser

Date: _____

Agent Authorization: I designate the above identified person(s) to act as my agent in all matters pertaining to this appeal.

Signed: _____

Date: _____

STATE OF CALIFORNIA -- THE RESOURCES AGENCY
GRAY DAVIS, Governor
CALIFORNIA COASTAL COMMISSION
45 FREMONT STREET, SUITE 2000
SAN FRANCISCO, CA 94105-2219
VOICE AND TDD (415) 904-5200

April 10, 2002

Section II, No 2. DESCRITPTION OF APPROVED DEVELOPMENT

Marin County approved a Coastal Development Permit to subdivide an 18.6-acre property into 13 parcels and construct a 36-unit mixed-residential project that includes:

- 7 affordable for-sale units;
- 2 market rate units;
- 27 rental housing units; and
- infrastructure improvements, including paved and unpaved roadways and parking areas, storm drainage facilities, water service extensions, and wastewater treatment systems.

The approved Point Reyes Affordable Housing Project is at 857 Mesa Road at the northern edge of the unincorporated village of Point Reyes Station in Marin County.

Section VI. REASONS FOR APPEAL

The approved development does not conform to the policies of the certified County of Marin Local Coastal Program (LCP) concerning allowable uses, minimum lot sizes, and setbacks.

Zoning

The action taken by the County of Marin approving Coastal Development Permit 2-MAR-00-134 for the subdivision of an 18.6-acre property into 13 parcels and the construction a 36-unit mixed-residential project is inconsistent with the existing zoning of the project site. The project site is partially zoned Coastal, Suburban Agricultural (C-RA: B-3) zoning which does not allow two-family dwelling units, requires a minimum lot size of 20,000 square feet per unit, and requires front, side, and rear setbacks of 30, 15, 10 feet respectively. The approved project includes two-family dwelling units that are not consistent with the setback and minimum 20,000 square-foot/unit parcel size requirements of the C-RA: B-3 zoning district.

STATE OF CALIFORNIA—THE RESOURCES AGENCY

GRAY DAVIS, GOVERNOR

CALIFORNIA COASTAL COMMISSION
45 FREMONT, SUITE 2000
SAN FRANCISCO, CA 94105-2219
VOICE AND TDD (415) 904-5200
FAX (415) 904-5400

RECEIVED
APR 10 2002
CALIFORNIA
COASTAL COMMISSION

APPEAL FROM COASTAL PERMIT DECISION OF LOCAL GOVERNMENT

Please Review Attached Appeal Information Sheet Prior To Completing This Form.

SECTION I. Appellant(s)

Name, mailing address and telephone number of appellant(s):

Mike Reilly
County of Sonoma, 575 Administration Dirve, Room 100
Santa Rosa, CA 95403-2887 (707) 565-2241
Zip Area Code Phone No.

SECTION II. Decision Being Appealed

1. Name of local/port government: Marin County

2. Brief description of development being appealed: See attached

3. Development's location (street address, assessor's parcel no., cross street, etc.): 857 Mesa Road, Pt. Reyes Station, Marin County

4. Description of decision being appealed:

a. Approval; no special conditions: _____

b. Approval with special conditions: x

c. Denial: _____

Note: For jurisdictions with a total LCP, denial decisions by a local government cannot be appealed unless the development is a major energy or public works project. Denial decisions by port governments are not appealable.

TO BE COMPLETED BY COMMISSION:

APPEAL NO: A-2-MAR-02-009

DATE FILED: 4/10/02

DISTRICT: North Central Coast District

H5: 4/88

5. Decision being appealed was made by (check one):

a. __Planning Director/Zoning Administrator

b. x City Council/Board of Supervisors

c. __Planning Commission

d. __Other_____

6. Date of local government's decision: _____

7. Local government's file number (if any): _____

SECTION III. Identification of Other Interested Persons

Give the names and addresses of the following parties. (Use additional paper as necessary.)

a. Name and mailing address of permit applicant:
Point Reyes Affordable Homes, Inc. Attn: Lamar Turner
2169 East Francisco Boulevard, Suite B
San Rafael, CA 94901

b. Names and mailing addresses as available of those who testified (either verbally or in writing) at the city/county/port hearing(s). Include other parties which you know to be interested and should receive notice of this appeal.

(1) _____

(2) _____

(3) _____

(4) _____

SECTION IV. Reasons Supporting This Appeal

Note: Appeals of local government coastal permit decisions are limited by a variety of factors and requirements of the Coastal Act. Please review the appeal information sheet for assistance in completing this section, which continues on the next page.

State briefly your reasons for this appeal. Include a summary description of Local Coastal Program, Land Use Plan, or Port Master Plan policies and requirements in which you believe the project is inconsistent and the reasons the decision warrants a new hearing. (Use additional paper as necessary.)

SEE ATTACHED.

Note: The above description need not be a complete or exhaustive statement of your reasons of appeal; however, there must be sufficient discussion for staff to determine that the appeal is allowed by law. The appellant, subsequent to filing the appeal, may submit additional information to the staff and/or Commission to support the appeal request.

SECTION V. Certification

The information and facts stated above are correct to the best of my/our knowledge.

Signed: _____
Appellant or Agent MikeReilly

Date: _____

Agent Authorization: I designate the above identified person(s) to act as my agent in all matters pertaining to this appeal.

Signed: _____

Date: _____

STATE OF CALIFORNIA -- THE RESOURCES AGENCY GRAY DAVIS, Governor
CALIFORNIA COASTAL COMMISSION
45 FREMONT STREET, SUITE 2000
SAN FRANCISCO, CA 94105-2219
VOICE AND TDD (415) 904-5200

April 10, 2002

Section II, No 2. DESCRITPTION OF APPROVED DEVELOPMENT

Marin County approved a Coastal Development Permit to subdivide an 18.6-acre property into 13 parcels and construct a 36-unit mixed-residential project that includes:

- 7 affordable for-sale units;
- 2 market rate units;
- 27 rental housing units; and
- infrastructure improvements, including paved and unpaved roadways and parking areas, storm drainage facilities, water service extensions, and wastewater treatment systems.

The approved Point Reyes Affordable Housing Project is at 857 Mesa Road at the northern edge of the unincorporated village of Point Reyes Station in Marin County.

Section VI. REASONS FOR APPEAL

The approved development does not conform to the policies of the certified County of Marin Local Coastal Program (LCP) concerning allowable uses, minimum lot sizes, and setbacks.

Zoning

The action taken by the County of Marin approving Coastal Development Permit 2-MAR-00-134 for the subdivision of an 18.6-acre property into 13 parcels and the construction a 36-unit mixed-residential project is inconsistent with the existing zoning of the project site. The project site is partially zoned Coastal, Suburban Agricultural (C-RA: B-3) zoning which does not allow two-family dwelling units, requires a minimum lot size of 20,000 square feet per unit, and requires front, side, and rear setbacks of 30, 15, 10 feet respectively. The approved project includes two-family dwelling units that are not consistent with the setback and minimum 20,000 square-foot/unit parcel size requirements of the C-RA: B-3 zoning district.