FINAL

ENVIRONMENTAL IMPACT REPORT

LION'S GATE RESERVE

Lead Agency: County of Santa Clara

File #4039-67-28-93
SCH #94043016

July 1996

TABLE OF CONTENTS

INTRODUCTION

This document, together with the Draft EIR, constitutes the Final EIR on the Lion's Gate Reserve, and includes the following: 1) text amendments to the DEIR; 2) a list of agencies, organizations and individuals who submitted written comments on the Draft EIR, and those who presented oral comments at the Planning Commission public hearing on May 2, 1996; 3) copies of the written comments received and summaries of the comments presented at the public hearing; and 4) responses to the written and oral comments.

An Environmental Impact Report is an informational document which, when fully prepared in accordance with the CEQA and State CEQA Guidelines, will inform public decision makers and the general public of the environmental effects of projects they propose to carry out or approve. The EIR process is intended to enable public agencies to evaluate a project to determine whether it may have a significant effect on the environmental, to examine and institute methods of reducing adverse impact, and to consider alternatives to the project as proposed. These things must the done prior to approval of the project. While CEQA requires that major consideration be given to preventing environmental damage, it is recognized that public agencies have obligation to balance other public objectives, including economic and social factors, in determining whether and how a project should be approved.

As defined in the State CEQA Guidelines, the standards for adequacy of an EIR are that it should be prepared with a sufficient degree of analysis to provide decision-makers with information that enables them to make a decision that intelligently takes into account environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in light of what is reasonable feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of agreement. The courts have not looked for perfection, but for adequacy, completeness, and a good-faith effort at full disclosure

SUMMARY

A. PROJECT DESCRIPTION

The Lion's Gate site consists of a 1,676-acre site located west of the unincorporated community of San Martin in south Santa Clara County, approximately one mile south of Morgan Hill.

The proposed project consists of the following: 18-hole public access golf course with a clubhouse, a swim and tennis center, and 45 units of overnight accommodations; 41 lots for single-family dwellings; an equestrian center; and 1,265 acres to be maintained as permanent open space.

The discretionary approvals required for the project include: a General Plan Amendment to redesignate approximately 270 acres from "Agriculture-Medium Scale" to "Hillsides," along with the corresponding rezoning for this area; a Conditional Use Permit for the golf course and related facilities; two cluster subdivision approvals, one for 6 lots on a 32-acre Rural Residential parcel, and a second for a 35 lot Hillside cluster subdivision, and 1,265-acre permanent open space area.

B. SUMMARY OF IMPACTS AND MITIGATIONS

IMPACT	MITIGATION
A. LAND USE	
1. The project would result in a substantial alteration of the land use of the site. **(Less-than-Significant Impact)**	1. No mitigation required.
B. AGRICULTURE	
1. The development of the site would result in the loss of approximately 180 acres of Class II soils, including approximately 110 acres designated as "Prime Farmland" or "Farmland of Statewide Importance." **(Potential Significant Impact)**	1. The loss of approximately 110 acres of prime farmland would be offset by the planting of vineyards and/or orchards in areas not proposed for development. **(Less-than-Significant Impact with Mitigation)**
2. The residential lots proposed at the eastern end of the site would potentially create land use conflicts with nearby agricultural operations. **(Potential Significant Impact)**	2. The creation of buffer zones along the eastern edge of the site would minimize the interface conflicts with existing farming operations. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION

C. PARKS, RECREATION AND OPEN SPACE

1. The conversion of portions of the site to golf course and residential uses would represent a substantial loss of semi-natural open space. **(Potential Significant Impact)**	1a. The project would provide approximately 263 acres of managed recreational open space in the form of a golf course. The golf course would provide an added recreational opportunity in the County. b. The remaining 1,265 acres of natural and semi-natural area of the site would be preserved as permanent open space as a condition of the cluster development permit. c. A trail easement for the 2 to 3 mile segment of the proposed San Martin Cross-Valley Trail would be dedicated in conjunction with the project. Segments of two additional trails along the project frontages on Coolidge Avenue and Watsonville Road would be dedicated and improved in conjunction with required roadway dedications and improvements. **(Less-than-Significant Impact with Mitigation)**

D. GEOLOGY AND SOILS

1. Potential secondary ground rupture or sympathetic movement along inactive faults crossing the site may result in minor damage to structures, roadways and utility lines located directly over such features. **(Potential Significant Impact)**	1a. Where proposed structures for human occupancy are determined to be underlain by an inactive fault trace, appropriate setback distances for those structures may be required. b. Potential for rupture of water, wastewater or utility lines would be reduced by measures such as the use of pipes with flexible or telescoping couplings, double pipe and other measures. **(Less-than-Significant Impact with Mitigation)**
2. Strong ground shaking during an earthquake may damage buildings, bridges and other structures. **(Potential Significant Impact)**	2. Structural damage to buildings would be largely prevented by following the Uniform Building Code, as required. Bridges and other structures would be designed in accordance with seismic design loads, as determined by the project geologist. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION
D. GEOLOGY AND SOILS (CONT'D)	
3. Seismic shaking could induce ground failure resulting from liquefaction, potentially causing damage to buildings and other structures. **(Potential Significant Impact)**	3. If liquefiable material is found at building sites, mitigation would involve subexcavation of the liquefiable material and replacement with engineered fill, or alternative measures as recommended by the project geologic engineer. **(Less-than-Significant Impact with Mitigation)**
4. Seismic ground shaking could induce lateral spreading, potentially causing damage to buildings and other structures. **(Potential Significant Impact)**	4. The risk of damage from lateral spreading would be minimized by setting planned structures back a safe distance from stream banks, in accordance with the recommendations of the project geologist and geotechnical engineer. **(Less-than-Significant Impact with Mitigation)**
5. The presence of unstable slopes and landslide deposits on the project site may pose a hazard to some proposed structures, and may be affected by project grading, construction, and spray irrigation of treated effluent. **(Potential Significant Impact)**	5. Potential damage from landslides would be avoided by setting structures back from known landslide deposits, by repairing landslides, or by implementing other slope stabilization measures. **(Less-than-Significant Impact with Mitigation)**
6. Potential debris flows originating in the hillside areas of the site could cause damage to proposed structures and the golf course. **(Potential Significant Impact)**	6. Where a potential for debris flow is present, the hazard would be mitigated by removing accumulations of soil from the potential source areas, or by constructing debris deflection, channeling and containment facilities at the mouths of the potentially affected ravines. **(Less-than-Significant Impact with Mitigation)**
7. Expansive soils present on the site may cause movement or heaving, potentially resulting in damage to foundations, concrete slabs and pavements. **(Potential Significant Impact)**	7. Potential damage to foundations and pavements would be avoided or mitigated by following the requirements of the Uniform Building Code, and may necessitate removal of the expansive soils from areas where buildings, slabs-on-grade or pavements are planned to be constructed. **(Less-than-Significant Impact with Mitigation)**
8. Areas with potential soil creep may cause damage to foundations, concrete pads and pavements. **(Potential Significant Impact)**	8. Protection from potential surface sliding and soil creep would be provided by preventing surface water from draining onto potentially unstable slopes, through subsurface drainage control, and by providing for resistance to higher lateral pressures in the design of footings and walls. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION
D. GEOLOGY AND SOILS (CONT'D)	
9. Project grading and vegetation removal may result in erosion and sedimentation of downstream waterbodies. **(Potential Significant Impact)**	9. Erosion control practices would be implemented during grading and construction. (See text in Section *III. F. Water Quality* for details.) **(Less-than-Significant Impact with Mitigation)**
10. Shallow groundwater conditions in areas of the site may adversely affect below-ground structures and utilities. **(Potential Significant Impact)**	10. Groundwater problems would be minimized by avoiding construction during or just after the rainy season, and through implementation of grading and drainage measures to improve surface and subsurface drainage. **(Less-than-Significant Impact with Mitigation)**
11. Any unplanned grading or construction activity that encroaches upon the on-site serpentine hillsides could result in the release of airborne particulates of naturally-occurring chrysotile asbestos previously bound in the rock, potentially causing a public health hazard in the form of inhalation. **(Potential Significant Impact)**	11. The disturbance of the serpentine bedrock area, would be avoided by ensuring that no development or grading is planned for this area. In addition, the edge of this area would be flagged, fenced or roped-off to prevent inadvertent encroachment by construction equipment. **(Less-than-Significant Impact with Mitigation)**
E. HYDROLOGY AND DRAINAGE	
1. The project would potentially result in increased downstream flooding during the 100-year and 10-year storms. **(Potential Significant Impact)**	1. The on-site lake proposed for the southern residential cluster subdivision would be designed to provide sufficient detention storage for increased peak runoff resulting from site development. With this pond, the peak flow rates leaving the project site during the 100-year and the 10-year storms would be lower than under existing conditions. **(Less-than-Significant Impact with Mitigation)**
2. Portions of the residential cluster subdivisions would be subject to shallow flooding (one-foot average depth) during a 100-year event, and the proposed structures could also partially obstruct this sheet flow through the site. **(Potential Significant Impact)**	2. Potential impacts to the residential subdivisions from shallow flooding would be mitigated by constructing building pads on fills raised above flood elevations. The partial obstruction of shallow overland sheet flows by the proposed development would be mitigated by balancing fills with cuts within the flood-prone areas. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION
F. WATER QUALITY	
1. During grading and construction, erosion from exposed slopes, and pollutants from equipment may result in water quality impacts to downstream water bodies. **(Potential Significant Impact)**	1. The final golf course grading plan would be required to conform to all drainage and erosion control standards adopted by Santa Clara County and would require approval by the County. A comprehensive erosion control program and Storm Water Pollution Prevention Plan (SWPPP) would be required to be implemented during grading and construction (see text for details). **(Less-than-Significant Impact with Mitigation)**
2. After project completion, concentrated runoff from paved surfaces may result in isolated areas of erosion. **(Potential Significant Impact)**	2. Stormwater would be collected and dispersed in a manner to prevent concentrated flows, or outfall areas would be protected with channel armoring to prevent erosion and scouring. **(Less-than-Significant Impact with Mitigation)**
3. The project would generate nonpoint urban pollutants which may be carried in stormwater runoff from paved surfaces to downstream waterbodies. **(Potential Significant Impact)**	3. The project would include stormwater controls at the parking lots and maintenance facility. **(Less-than-Significant Impact with Mitigation)**
4. The project may result in water quality impacts to groundwater due to the use of fertilizers and pesticides on the golf course. **(Potential Significant Impact)**	4. The project would follow irrigation and chemical management practices under which application of water, fertilizers and chemicals would precisely meet plant needs, thus minimizing potential for leaching into the groundwater table. Monitoring wells would be installed to sample for the presence of golf course chemicals, with corrective action taken if necessary. **(Less-than-Significant Impact with Mitigation)**
5. The project may result in water quality impacts to surface water from fertilizers and pesticides used on the golf course. **(Potential Significant Impact)**	5. The potential for surface water quality impacts from golf course chemicals would be mitigated by infiltration into turf and rough areas, the use of grass filter strips, maintenance of setbacks for streams, and strategic installation of subdrains and retention basins. Surface water quality would be sampled and tested periodically, with corrective action taken if necessary. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION
F. WATER QUALITY (CONT'D)	
6. The equestrian center could result in impacts to groundwater and surface water quality if manure or stall sweepings accumulate in stormwater runoff. **(Potential Significant Impact)**	6. The equestrian center would be operated in accordance with a manure management plan and an erosion control plan; and runoff from the facility would be directed to an on-site retention pond. **(Less-than-Significant Impact with Mitigation)**
7. The soils in the existing livestock corrals may contain accumulated nitrogenous compounds which could result in impacts to surface and groundwater quality. **(Potential Significant Impact)**	7. The potentially affected soils would be sampled for nitrogen content and incorporated into the grading of the golf course in a manner that makes maximum benefit of the fertilizer value of the soil. **Less-than-Significant Impact with Mitigation)**

[NOTE: The potential water quality impacts associated with wastewater disposal are discussed under *Q. Wastewater Treatment and Disposal*]

G. BIOLOGICAL RESOURCES	
1. The project would involve the removal of 246 acres of non-native grasslands, orchards, cropland and residential landscaping. **(Less-than-Significant Impact)**	1. No mitigation required. (Approximately 482 acres of grasslands would be included in the area to remain as permanent open space.)
2. Development of the two partially wooded lots (Lots 24 & 25) in the residential cluster subdivision in the southeastern portion of the site may result in the limited removal of valley oak woodland. **(Potential Significant Impact)**	2. The removal of valley oak woodland within Lots 24 & 25 would be avoided to the extent feasible by placing the building envelopes in areas with relatively little tree cover. Any valley oaks which cannot be avoided by the future residential construction would be replaced at a ratio of 5:1. **(Less-than-Significant Impact with Mitigation)**
3. The project would result in the loss of 0.83 acres of riparian vegetation or in the reduction of habitat quality in the riparian zone. **(Potential Significant Impact)**	3. Impacts to the riparian habitat would be avoided to the extent feasible. The unavoidable loss of riparian vegetation and the reduction of habitat value would be mitigated by the on-site replacement of lost habitat, and by measures to protect and enhance the remaining habitat. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION
G. BIOLOGICAL RESOURCES (CONT'D)	
4. The proposed golf course would result in the removal of up to 18 trees. **(Potential Significant Impact)**	4a. Existing trees would be preserved to the greatest extent possible. b. A tree replacement program would be prepared to provide for replacement of native trees removed by the project. c. Detailed guidelines would be prepared by a certified arborist to minimize potential damage to trees to be preserved. **(Less-than-Significant Impact with Mitigation)**
5. The main access road would cross the driplines of several oak trees near the proposed eastern bridge across West Branch Llagas Creek, potentially resulting in stress or damage to those trees. **(Potential Significant Impact)**	5. Grading and paving within the driplines of the affected oaks would be subject to the recommendations of a qualified arborist to minimize stress and damage, with replacement required for any trees that do not survive. **(Less-than-Significant Impact with Mitigation)**
6. The proposed project may result in direct impacts to the California tiger salamander, a special-status species, and would result in loss of breeding habitat for the tiger salamanders. **(Potential Significant Impact)**	6. The project would include measures to reduce direct mortality to the California tiger salamander, and measures to preserve existing habitat and create new habitat to replace the habitat lost due to the project. **(Less-than-Significant Impact with Mitigation)**
7. The proposed project may result in direct impacts to the western pond turtle, a special-status species, and would result in the loss of potential upland habitat for the pond turtle. **(Potential Significant Impact)**	7. The project would include measures to preserve existing pond turtle habitat, and to create new habitat on the project site. **(Less-than-Significant Impact with Mitigation)**
8. The special-status plant and invertebrate species of the serpentine grasslands on the site would be subject to potential disturbance by grading for the adjacent residential subdivision, and by the general intensification of human activity resulting from the project. **(Potential Significant Impact)**	8. The serpentine habitat area would be fenced, and signs would be posted to prevent encroachment of grading from the adjacent residential subdivision, and to prevent the incursion of human activities after the project is completed. **(Less-than-Significant Impact with Mitigation)**
9. Project construction may adversely affect any future burrowing owl nests that may be established on the site prior to development. **(Potential Significant Impact)**	9. Preconstruction surveys would be conducted 30 days prior to site grading to ensure that no burrowing owl nests have been established, with implementation of appropriate mitigations if active nests are found. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION
G. BIOLOGICAL RESOURCES (CONT'D)	
10. The project may adversely affect any future nests of the Golden Eagle or other raptors that could be established on the site prior to development. **(Potential Significant Impact)**	10. Preconstruction surveys would be conducted 30 days prior to site grading to ensure that no active eagle or raptor nests have been established on the site, with implementation of appropriate mitigations if active nests are found. **(Less-than-Significant Impact with Mitigation)**
11. The project would result in the reduction of on-site habitat for the ringtail, American badger, California horned lizard, and several species of raptor, all of which are special-status species which occur or potentially occur on the site. **(Less-than-Significant Impact)**	11. No mitigation required.
12. The project would eliminate approximately 1.2 acres of existing wetlands on the site. **(Potential Significant Impact)**	12a. A detailed wetland protection, replacement and restoration plan would be prepared which meets with the approval of the County, the Corps of Engineers, and the Department of Fish and Game. b. Best management practices would be used to manage and maintain the golf course in order to minimize impacts of pesticides, fertilizers and herbicides on the wetlands of the site. c. A detailed erosion and sedimentation control plan would be prepared and implemented during project grading and construction. **(Less-than-Significant Impact with Mitigation)**
13. The introduction of non-native species to the site may adversely affect the native vegetation of the site. **(Potential Significant Impact)**	13. The use of invasive species in project landscaping would be avoided. **(Less-than-Significant Impact with Mitigation)**
H. ARCHAEOLOGY	
1. The construction of the main project entrance road may have an adverse impact on the archaeological site recorded as CA-SCl-76. **(Potential Significant Impact)**	1. Grading and excavation in the vicinity of SCl-76 would be subject to intermittent or spot monitoring by a qualified archaeologist. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION

H. ARCHAEOLOGY (CONT'D)

2. In the other areas of the site which are archaeologically sensitive, such as at the locations where prehistoric sites were previously recorded but where no archaeological material was found in recent surveys, there is a potential that buried archaeological resources may be damaged or destroyed by grading or excavation for the project. **(Potential Significant Impact)**	2a. Should evidence of prehistoric cultural resources be discovered during construction, work in the immediate area of the find shall be stopped to allow adequate time for evaluation and mitigation, and a qualified professional archaeologist shall be called in to make an evaluation; the material shall be evaluated; and if significant, a mitigation program including collection and analysis of materials prior to the resumption of grading, preparation of a report, and curation of the materials at a recognized storage facility shall be developed and implemented under the direction of the Planning Office. b. In the event that human skeletal remains are encountered, the applicant is required by County Ordinance No. B6-18 to immediately notify the County Medical Examiner/Coroner (299-5137). Upon determination by the County Medical Examiner/Coroner that the remains are Native American, the Coroner shall contact the California Native American Heritage Commission, pursuant to subdivision (c) of section 7050.5 of the Health and Safety Code, and the County Coordinator of Indian Affairs. NO FURTHER DISTURBANCE OF SITE MAY BE MADE EXCEPT AS AUTHORIZED BY THE COUNTY MEDICAL EXAMINER/CORONER. If artifacts are found on the site, a qualified archaeologist shall be contacted, along with full compliance with section B6-19 of the Santa Clara County Code. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION
I. HISTORIC RESOURCES	
1. Demolition and earth moving activity at the existing ranch complex could have a potentially adverse effect on any buried remnants of the Hispanic Period adobe structures that once occupied this site. **(Potential Significant Impact)**	1. Grading and excavation in the vicinity of the ranch complex would be subject to intermittent or spot monitoring by a qualified archaeologist, with appropriate mitigations implemented in the event that cultural materials are encountered. (Note: Since the potential adobe structures are believed to be located within prehistoric site SCl-76, this monitoring would occur concurrently with monitoring for archaeological resources at that site, as described above.) **(Less-than-Significant Impact with Mitigation)**
J. VISUAL AND AESTHETICS	
1. The project would result in visual changes to some areas of the site open to public view. **(Less-than-Significant Impact)**	1. The project would be designed and landscaped in a manner to help it blend in with the natural and rural surroundings, and to reduce its visibility from off-site locations. **(Less-than-Significant Impact with Mitigation)**
2. Lighting for the project entrance, clubhouse, swim and tennis center, equestrian center, parking areas and internal roadways may produce light and glare at off-site locations. Reflective building materials may also produce glare. **(Potential Significant Impact)**	2. Project lighting would be sited and designed to minimize off-site light and glare. The project structures would be composed of non-reflective building materials and non-glare windows **(Less-than-Significant Impact with Mitigation)**
3. Grading, vegetation removal and construction activity would result in temporary scarring. Storage of construction equipment and materials may be visible from off-site locations. **(Potential Significant Impact)**	3. Graded areas would be revegetated as soon as possible, and screening berms would be created along the project frontage prior to construction of the dwellings in the proposed residential subdivisions. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION
K. TRAFFIC AND CIRCULATION	
1. The project would result in increased traffic generation at the project site. **(Less-than-Significant Impact)**	1. No mitigation required.
2. The project would increase the on-site parking required for the project site. **(Less-than-Significant Impact)**	2. No mitigation required. (The proposed site plans indicate that adequate on-site parking would be provided in accordance with the County Parking Standards.)
L. NOISE	
1. Traffic generated by the project would increase noise levels at existing residences. **(Less-than-Significant Impact)**	1. No mitigation required.
2. Portions of the 2 lots proposed in the vicinity of Coolidge Avenue would be exposed to traffic noise levels in excess of the 55 dBA L_{dn}, the County standard for residential uses. (However, under the proposed subdivision plan for this area, the minimum setbacks for dwellings on these lots would place them beyond the zone of potential noise impact.) **(Less-than-Significant Impact)**	2. No mitigation required.
3. Noise generated by golf course mowers would have a potentially adverse effect on nearby dwellings proposed on the project site. **(Potential Significant Impact)**	3. The hours of mowing within 330 feet of any proposed residence would be restricted to weekdays between the hours of 8:00 a.m. and 5:00 p.m., with total noise generating activities within any hour restricted in accordance with the limits set forth in the County's Noise Ordinance. **(Less-than-Significant Impact with Mitigation)**
4. Activities at the clubhouse would increase noise levels in the interior of Hayes Valley. **(Less-than-Significant Impact)**	4. No mitigation required.
5. Noise levels would be temporarily elevated during project grading and construction. **(Potential Significant Impact)**	5. Short-term construction noise impacts would be reduced through compliance with the County's Noise Ordinance with respect to hours of operation and maximum noise levels at adjacent property lines. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION
M. AIR QUALITY	
1. Construction and grading for the project may generate dust and exhaust emissions that could adversely affect local and regional air quality. **(Potential Significant Impact)**	1. Effective measures would be implemented to reduce construction-related emissions (see text for details). **(Less-than-Significant Impact with Mitigation)**
2. Traffic generated by the project would increase carbon monoxide emissions at local roadways and intersections. **(Less-than-Significant Impact)**	2. No mitigation required.
3. Emissions from project-generated traffic would result in air pollutant emissions affecting the entire San Francisco Bay air basin. **(Less-than-Significant Impact)**	3. No mitigation required.
N. HAZARDOUS MATERIALS, PUBLIC HEALTH AND SAFETY	
1. The historic and current agricultural activities on the Hayes Valley Ranch may have resulted in potential soil contamination due to spilled or leaked hydrocarbon products, pesticides and herbicides, PCBs from electrical transformers, and other potential sources of contamination. The existing residential structures may include materials that contain asbestos. **(Potential Significant Impact)**	1. Prior to demolition of the existing ranch structures and site grading, the areas identified as having potential soil or asbestos contamination would be sampled and tested to determine whether contaminants are present in hazardous concentrations. Any soils which are found to be contaminated would be subject to remediation measures, as appropriate. If asbestos-containing materials are found to be present, they would be removed in the manner specified by law. **(Less-than-Significant Impacts with Mitigation)**
2. Any unplanned construction or grading activity that encroaches upon the on-site serpentine hillside could result in the release of airborne particles of chrysotile asbestos, potentially causing a public health hazard if inhaled. **(Potential Significant Impact)**	2. To avoid disturbance to the serpentine bedrock area, the edge of this area would be fenced or roped-off to prevent encroachment by construction equipment. **(Less-than-Significant Impact with Mitigation)**
3. Improper use, handling and storage of hazardous materials used in the construction and operation of the golf course may result in potential soil or groundwater contamination. **(Potential Significant Impact)**	3. The project would be required to obtain and implement the provisions of a Hazardous Materials Storage Permit for the proper use, handling and storage of pesticides, herbicides and other hazardous products during construction and operation of the golf course. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION
N. HAZARDOUS MATERIALS, PUBLIC HEALTH AND SAFETY (CONT'D)	
4. The equestrian facility could result in potential vector and odor impacts. **(Potential Significant Impact)**	4. The equestrian facility would employ vector control measures, and would be operated in accordance with a manure management plan in conformance with State law, which would also be reviewed and approved by the County Department of Environmental Health. **(Less-than-Significant Impact with Mitigation)**
O. ELECTROMAGNETIC FIELDS (EMFs)	
1. The siting of residential lots in the vicinity of existing high-voltage power lines may potentially expose future residents to increased levels of electromagnetic fields. **(Less-than-Significant Impact)**	1. No mitigation required.
P. WATER SUPPLY	
1. The proposed project would increase the demand for water at the site. **(Potential Significant Impact)**	1a. Increased water supplies to meet project demand for domestic water would be provided by the West San Martin Water Works, without adversely affecting existing or future users. b. Water supplies for golf course irrigation would be provided by a combination of sources, including on-site pumping of groundwater, non-potable water from Twin Valley, Inc., and backup supplies from West San Martin Water Works. This water would be provided in a manner that would not exceed the safe yields of any of these sources. **(Less-than-Significant Impact with Mitigation)**
Q. WASTEWATER TREATMENT AND DISPOSAL	
1. The proposed project would increase the demand for wastewater treatment and disposal facilities at the site. **(Potential Significant Impact)**	1. Increased wastewater from the project would be treated and disposed with new facilities to be constructed in conjunction with the project. **(Less-than-Significant Impact with Mitigation)**
2. The proposed wastewater disposal facilities may result in degradation of surface water and groundwater quality. **(Potential Significant Impact)**	2. Groundwater wells would monitor water quality up-gradient and down-gradient of the proposed spray irrigation area, with corrective action taken as necessary. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION
Q. WASTEWATER TREATMENT AND DISPOSAL (CONT'D)	
3. The use of reclaimed wastewater for golf course irrigation would expose humans to possible physical contact with the treated wastewater, resulting in a potential public health hazard. **(Potential Significant Impact)**	3. The wastewater would be treated to levels deemed acceptable for disposal on golf courses, and the areas affected would be posted to notify golfers and employees where irrigation by treated wastewater is occurring. **(Less-than-Significant Impact with Mitigation)**
4. There is a potential for overflow of the storage reservoir, resulting in a public health hazard. **(Potential Significant Impact)**	4. The wastewater storage reservoir would have sufficient capacity to accommodate high rainfall years. **(Less-than-Significant Impact with Mitigation)**
5. The wastewater treatment and disposal system could generate odors. **(Potential Significant impact)**	5. Odor control would be achieved by mechanisms incorporated into the design of the pump stations and the treatment plant, and by measures to be undertaken at the effluent storage pond. **(Less-than-Significant Impact with Mitigation)**
6. The existing pond and proposed open water areas of the project, such as the wastewater storage pond and residential lake, have the potential to be sites for breeding of mosquitoes, which could create a nuisance and a potential public health problem. **(Potential Significant Impact)**	6. Mosquito breeding would be controlled by several methods, as appropriate for each type of water body. These methods would include the circulation of water to prevent stagnant conditions, the introduction of mosquito fish, and the application of larvacides. The specific mosquito mitigation measures would be formulated in consultation with the Department of Environmental Health Vector Control District. **(Less-than-Significant Impact with Mitigation)**
R. FIRE PROTECTION	
1. Portions of the project site are located in areas designated as Extreme or Moderate Fire Hazard areas, and thus may be subject to loss of life and property in the event of a wildland fire. **(Potential Significant Impact)**	1. The project would be required to implement the County Fire Marshal's conditions for fire protection, including minimum roadway standards, adequate water storage and pressure for fire fighting, installation of hydrants and automatic sprinklers, vegetation clearance and building specifications. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION

S. POLICE AND SECURITY

1. The project may result in increased demand for police services at the site. **(Less-than-Significant Impact)**	1. No mitigation required.

T. SCHOOLS

1. The proposed residential subdivisions would generate 32 school-aged children within the Morgan Hill Unified School District, where the schools are already impacted. **(Potential Significant Impact)**	1. The project's impacts to schools would be mitigated by the state-mandated school impact fee charged to the builder, and by the property tax increment for schools to be paid by the future homeowners under the existing Mello-Roos district that includes the Lion's Gate site. **(Less-than-Significant Impact with Mitigation)**

U. UTILITIES

1. The project would increase demand for electric power, natural gas and telephone service at the site. **(Less-than-Significant Impact)**	1. No mitigation required.

V. SOLID WASTE

1. The project would increase the generation of solid waste at the site, thereby reducing overall disposal capacity at local landfill sites. **(Less-than-Significant Impact)**	1. Provisions for recycling, composting and "grass cycling" would be incorporated into the project operation to reduce solid waste generation. **(Less-than-Significant Impact)**

W. ENERGY

1. The project would result in the consumption of non-renewable energy resources in both the construction and operational phases of the project. **(Less-than-Significant Impact)**	1. Energy conservation measures would be incorporated into the project in accordance with Title 24 of the California Administrative Code. The project would also incorporate other energy-efficient features in building design and construction, and in the operation of the irrigation system. **(Less-than-Significant Impact)**

I. LIST OF AGENCIES, ORGANIZATIONS AND INDIVIDUALS COMMENTING ON THE LION'S GATE RESERVE EIR

	Written Comments Received From	Response Required?
A.	California Department of Fish and Game	Yes
B.	California Native Heritage Commission	Yes
C.	California Regional Water Quality Control Board - Central Coast Region	Yes
D.	California Department of Toxic Substances Control	Yes
E.	California Department of Transportation	Yes
F.	Santa Clara Valley Water District	Yes
G.	County of Santa Clara Department of Environmental Health	Yes
H.	County of Santa Clara Integrated Waste Management Program	Yes
I.	County of Santa Clara Parks and Recreation Department	No
J.	County of Santa Clara Planning Commissioner Thomas Kruse	Yes
K.	County of Santa Clara Roads and Airports Department	Yes
L.	City of Morgan Hill	Yes
M.	Committee for Green Foothills	Yes
N.	Greenbelt Alliance	Yes
O.	Santa Clara County Audubon Society	Yes
P.	Sierra Club - Loma Prieta Chapter	Yes
Q.	Colliers Parrish International	No
R.	Forst Commercial Real Estate	No
S.	Moison Investment Company	No
T.	Twin Valley, Inc.	No
U.	John and Chris Ambrose	Yes

Written Comments Received From		Response Required?
V.	Ernie Donato	Yes
W.	Timothy Duff	Yes
X.	Lyle and Esther Hughes	No
Y.	Doug Marlitt	Yes
Z.	Jeffrey Martin	Yes
Z1.	Shelley E. Moeller	Yes
Z2.	Dwayne and Cathy Turpin	Yes
Z3.	Royanne Ukestad	No

Comments Presented at the Planning Commission Hearing on the DEIR, May 2, 1996

AA.	Julia Bott, Sierra Club	Yes
BB.	Camas Hubenthal, Committee for Green Foothills	Yes
CC.	Vicki Moore, Greenbelt Alliance	Yes
DD.	Pat Forst, Forst Commercial Real Estate	Yes
EE.	Craig Breon, Santa Clara County Audubon Society	Yes
FF.	Steve Havens, Twin Valley, Inc.	Yes
GG.	Bob Murphy, Northern California Golf Association	No
HH.	Bob Ukestad, West San Martin Water Works	No
II.	Royanne Ukestad	No
JJ.	Chris Williams	No
KK.	John Ambrose	Yes
LL.	Tom Kruse, Planning Commissioner	Yes
MM.	Brent Ventura, Planning Commissioner	Yes
NN.	Tom Tanner, Planning Commissioner	Yes

II. OVERVIEW OF MAIN ISSUES DISCUSSED IN COMMENTS ON DEIR

A. WATER SUPPLY

General Overview of Issue

Given the large volume of water needed to irrigate the golf course, concerns have been raised as to whether sufficient water supply can be drawn from the local aquifers without resulting in overdraft of the groundwater resource, potentially resulting in impacts to other wells in the vicinity.

Background

As discussed in Section III. P. of the DEIR, the Lion's Gate project would rely on three sources of supply for irrigation water. These include pumping on-site groundwater as the primary source, and obtaining supplemental water supply from West San Martin Water Works and Twin Valley, Inc.

In order to establish that adequate water supply can in fact be obtained from these sources, Geoconsultants, Inc., prepared two preliminary water availability studies that determined the probable safe yield from these three sources (see Appendix M of the DEIR). The first study conservatively estimated the average daily safe yield for on-site groundwater to be 280,000 gallons per day. For West San Martin Water Works, the safe yield was estimated to be 480,000 gallons per day above current usage rates, and the safe yield for Twin Valley, Inc. was estimated to be 14,000 gallons per day over current usage rates. Since the average daily irrigation demand from the project is estimated to be 334,000 gallons per day, it is clear that sufficient water supply is available from the combination of sources to provide for the irrigation needs of the golf course. (The Santa Clara Valley Water District, in a memo dated June 26, 1996, has indicated its concurrence that there is sufficient water available for the project. This memo has been added to the EIR and is included in *Section V. REVISIONS TO THE APPENDICES OF THE EIR.)* The Geoconsultants report stated that the impact of on-site groundwater pumping on down-gradient wells would be minimal provided that the on-site irrigation wells were located a prudent distance from the eastern boundary of the site. Given the large size of the Lion's Gate site, there is no doubt that adequate setbacks for on-site production wells can be provided.

Major Comments and Responses

1. **The Geoconsultants study shows that average daily water demand would be less than average daily safe yield from on-site groundwater. What assurance is there that the higher rates of on-site groundwater pumping during the summer months will not have an impact on the groundwater and on neighboring wells down-gradient.**

   Response

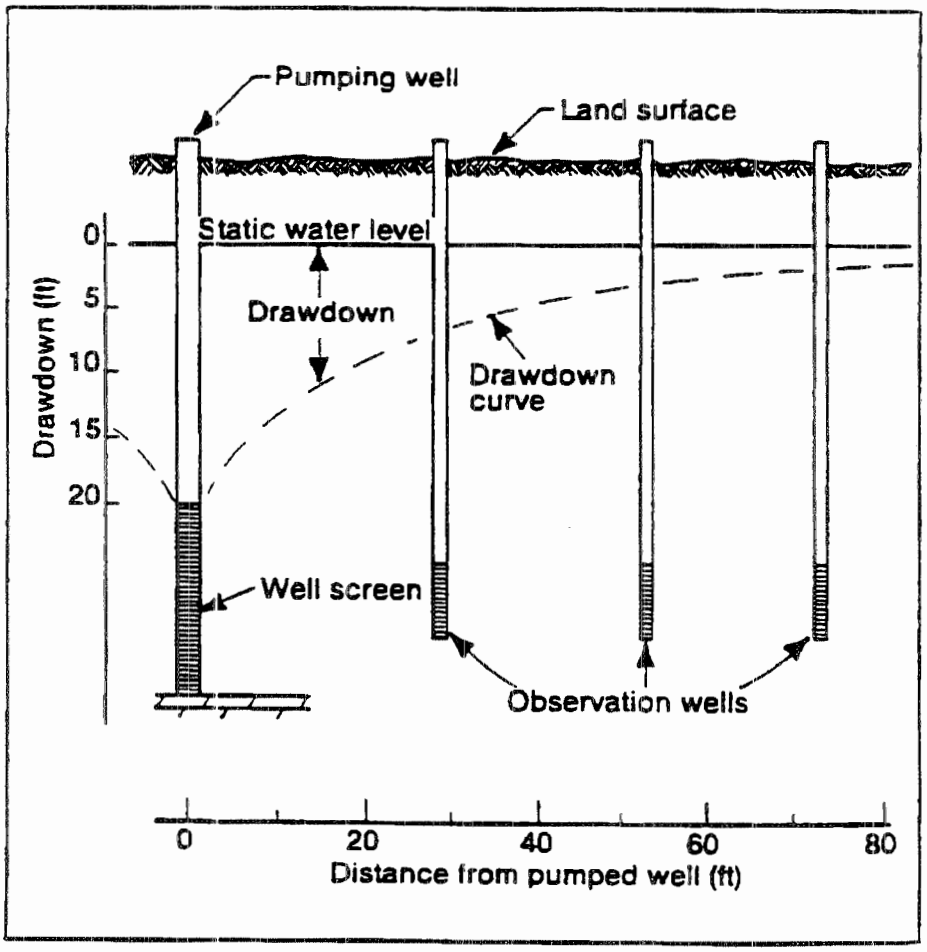
   The calculation of average daily yield is based on the total volume of groundwater available for the entire year. Thus it takes into account periods of very low demand, such as winter, when groundwater supplies could be said to be banked for higher demand periods in summer when pumping rates would exceed the average daily safe yield.

   However, it is clear that the average daily safe yield of 280,000 gallons per day is not sufficient to meet the average daily irrigation demand of 334,000 gallons per day. Thus off-site water sources are needed to prevent impacts to the on-site aquifer. The question then becomes how to determine when on-site pumping should be reduced or suspended to prevent such impacts. This would initially be calculated based on

information obtained during the detailed engineering-level water supply investigations (see item 4 below for a full description). There are several reasons why such detailed studies are not warranted at this stage in the development approval process. First, there is no doubt on the part of Geoconsultants that there is adequate water supply available for the project, even under prolonged drought conditions. Secondly, there is no doubt on the part of Geoconsultants that impacts to downgradient wells can be readily avoided by placement of production wells a prudent distance from the eastern project boundary. These issues are discussed in detail below. Since these threshold issues of concern to the EIR have been settled based on preliminary studies, there is no need to undertake the detailed engineering-level water supply investigations at this stage. Since the applicant has not yet received any discretionary project approvals from the County, it would impose an unreasonable financial risk on the applicant to require detailed engineering studies at this stage, which would also be premature from a technical standpoint. The optimum time to undertake detailed water supply investigations would be in the fall when the groundwater table has reached a static condition and is no longer under the influence of the previous winter's rainfall.

The prevention of overpumping would be assured by the installation of a down-gradient monitoring well on the site which would be monitored constantly during peak pumping periods to observe any drawdown in the water table (see diagram below). This would provide an indication of when to suspend on-site pumping and start drawing exclusively from the supplemental sources. In addition, existing off-site wells would also be monitored to ensure that impacts are not occurring to these wells.

After the system has been in operation for a period of time, the project geohydrologist would obtain a more refined knowledge of the aquifer based on rainfall and pumping records. This would provide the basis for predicting available on-site groundwater for a given year, including drought years, based on the previous winter's rainfall.



2. **What assurance is there that adequate water supplies would exist for the project during severe and prolonged drought conditions.**

Response

Under severe drought conditions, it is reasonable to assume that little or no water would be available from on-site groundwater or Twin Valley, Inc. Thus all of the irrigation water supply for the project would have to be supplied by West San Martin Water Works. According to the Geoconsultants report of February 20, 1996 (contained in Appendix M of the DEIR), WSMWW has more than sufficient surplus safe yield to provide for all of the project's irrigation requirements.

The water company draws from three 400-foot deep wells in central San Martin, and no difficulties whatsoever were experienced by the water company during the last drought, so no rationing program had to be implemented. During the height of the drought, water levels in the Llagas groundwater basin dropped only to 112 feet below the ground surface, far above the level of the water company's pump. It is also worth noting that the overall water demand in the West San Martin service area has actually declined over the years with the reduction in agricultural irrigation.

In the event of a prolonged drought, a drought contingency plan would be instituted at the golf course to reduce irrigation water demand. As discussed on page 189 of the DEIR, water usage at the golf course would be cut back in phases. As a drought develops and/or water supplies diminish, irrigation applications would first be reduced in less critical areas such as fairways. As conditions worsen, irrigation of fairways would be further reduced or suspended altogether, depending on the severity of the drought. During this time, irrigation would also be reduced on higher priority areas such as tees and fairway landing areas, to a level which would still maintain plant life, but at a severely stressed level. The greens would be the last to have reduced irrigation because they include the most critical turfgrass, and because they make up only about 4 percent of the total irrigated acreage.

3. **Since the safe-yield study for the on-site aquifer was based on data from 1971, the estimated safe-yield should be recalculated based on recent rainfall data that takes into account the last two droughts.**

Response

The rainfall information cited from Rantz (1971) consisted of an isohyetal (rainfall contour) map of the greater Bay Area. The precipitation values were based on specific gauges throughout the area, and represent average rainfall for the 50-year period between 1906 and 1956. Although this study has not been updated since then, the gauges have continued to monitor rainfall. There is no precipitation gauge presently installed at the site; however, a gauge in Gilroy has determined average annual rainfall to be 20 inches for the period of 1956 through 1994. Rantz's isohyetal map showed rainfall at Gilroy to also be 20 inches for the period from 1906 to 1956. Therefore, due to the close proximity of Gilroy to the site, it can be assumed that the annual rainfall for Hayes Valley has also continued to be the same (at 21 inches) since 1956. Therefore, the safe-yield estimate for on-site groundwater is based on reliable rainfall data.

4. **Detailed aquifer studies, including pump tests, should be performed now to verify that adequate water supply exists, and to specify the locations of production wells to ensure that no impacts would occur to off-site wells.**

Response

There is no doubt in the part of Geoconsultants that more than sufficient water supplies are available to serve the project from on-site groundwater in combination with supplemental supplies from West San Martin Water Works. In fact, the West San Martin Water Works has sufficient reserves that it could serve all of the irrigation needs of the project without adversely affecting existing or future customers. (The Santa Clara Valley Water District, in a memo dated June 26, 1996, has indicated it concurrence that there is sufficient water available for the project. This memo has been added to the EIR and is included in Section *VI. REVISIONS TO THE APPENDICES OF THE EIR.)* As noted in the recent letter from the Water Company that has been added to Appendix M of the EIR, the bulk rate for irrigation water would be approximately one-third the rate for domestic water. In addition, Twin Valley, Inc. indicates in its letter (see Comment T) that it can provide up to 120,000 gallons per day to the Lion's Gate project. This reflects historic pumping rates from two wells which are no longer used because nitrate levels slightly exceed 1996 Safe Drinking Water Act standards. As such, two new deep wells were drilled to provide domestic water for Twin Valley's existing customers. Although Twin Valley, Inc. indicates that it can provide 120,000 gallons per day, the preliminary study by Geoconsultants conservatively estimated a total safe yield of 110,000 gallons per day from this aquifer, of which 96,000 gallons would be used by existing Twin Valley customers, leaving 14,000 gallons per day for the Lion's Gate project. This estimate was based on very conservative assumptions since a detailed field investigation was not undertaken; thus the actual remaining safe yield is expected to be somewhat greater.

In order to determine with greater precision the on-site safe yield for groundwater pumping, additional studies will be required prior to construction to define the characteristics of the aquifer. This detailed investigation would also determine the number of production wells needed, and their optimum locations, and in particular would establish setback distances for these new wells to ensure that they do not have an impact on off-site wells. There is no doubt on the part of Geoconsultants that there is sufficient area available on the site so that the required production well(s) can be placed in locations where they will not result in off-site impacts.

For purposes of the EIR, the Geoconsultants studies have sufficiently established that adequate water supply is available for the project without resulting in impacts to the resource or other wells. Therefore, although more detailed studies will be required at the detailed project design stage, they are not warranted for the EIR.

It should also be noted that in the event of prolonged drought, water usage would be cut back in phases as prescribed in a drought contingency plan to be prepared for the project. (See page 189 of the DEIR for a detailed description of the plan.) In addition, approximately 8 percent of the irrigation water would be provided by reclaimed effluent from the package wastewater treatment plant. (As discussed at pages 196-7 of the DEIR, the treated effluent would be applied at rates no greater than evapotranspiration rates, so there would be no surface runoff or seepage below the root zone.)

5. **What is the procedure for determining detailed on-site hydrogeologic conditions, for establishing the location of production wells, and for establishing a groundwater monitoring program.**

Response

Initially, a 24-hour aquifer test would be performed on one of the existing wells on the property. Static water levels would be measured in the pumping well as well as a monitoring network of at least one on-site well and one off-site well (i.e., existing well(s) on neighboring properties). Drawdown and recovery levels would be recorded in all wells during the pumping test. Based on the results of the aquifer test, calculations

of transmissivity, specific capacity, and storitivity would be prepared. This information would enable the geohydrologist to make a determination as to the maximum radius of pumping influence (see diagram on page 4). Once this has been established, a setback line can be drawn so that new on-site production wells would not have an impact upon existing off-site wells. Once the setback line has been established, an on-site survey for the purpose of locating one or more on-site production wells would be performed. Based on the results of this survey, one or more production wells would be constructed, and the water-bearing characteristics of the formations evaluated.

A 72-hour pumping test to determine well production parameters such as specific capacity and recommended pumping rates would be performed following construction of the wells. At the conclusion of the test, a water sample would be collected for an evaluation of constituents in accordance with State and County drinking water standards.

A monitoring well network would be developed including the production well(s), other on-site wells and appropriate off-site wells (i.e., existing wells on neighboring properties). In order to develop a water level history, measurements would be taken in each of the wells for an extended period of time. Individual well hydrographs would be developed. In addition, a precipitation gauge would be installed at the site in order to develop accurate rainfall totals. This information will allow periodic updates of the aquifer characteristics, and assure that an overdraft condition would not occur.

B. AGRICULTURE

General Overview of Issue

The project would involve the conversion of 110 acres of prime farmland to residential use. The agricultural economic study prepared for the DEIR concluded that an agricultural operation on the project site would not be economically viable under current conditions. Concerns have been raised as to whether this conclusion is valid, and whether a different conclusion may have been reached if more profitable crops, such as grapes, had been analyzed.

Background

The study of agricultural economics by Dr. James A. Niles analyzed the economic feasibility of three types of agriculture production - walnuts, row crops, and cattle - on the portions of the site where those activities had traditionally occurred. The study included an analysis of two scenarios for each crop type. The first scenario reflected existing site conditions such as current land rents and property tax rates. The second scenario assumed a family farm operation with no land costs and reduced property taxes under the Williamson Act. Even under the more favorable conditions of the second scenario, the operations were found to cover costs at best, with no return on investment. The study compared the site to an existing walnut operation in the San Joaquin Valley, which is economically successful.

Major Comments and Responses

1. **The conclusion that agricultural operations in South Santa Clara are not economically viable is incorrect. There is not a sufficient difference between Santa Clara County and San Joaquin County whereby the same activity would be economically viable there but not here.**

Response

The agricultural feasibility report prepared by Dr. Niles was unclear with respect to a key element of the analysis. That is, although the family farm scenarios assumed no land costs and reduced property taxes under the Williamson Act, the cost of starting up a new farming operation was factored into the cost analysis (this latter information was not clearly explained). These start-up costs, which include land preparation, the cost of walnut trees, and the cost of planting, were factored in to make these scenarios somewhat realistic. In the San Joaquin Valley example, there are no such start-up costs to be paid off, and therefore it is economically viable while the project case would not be. By the same token, Dr. Niles study was not meant to imply that existing agricultural operations in Santa Clara County are not economically viable, particularly since most of these operations are probably not carrying debt for start-up costs.

2. **Since the project includes the planting of vineyards as mitigation for the conversion of prime farmland, the economic study should include an analysis of vineyards as well. Because of the high prices available for grapes, such an analysis should show vineyards to be an economically viable operation here.**

Response

In response to this comment, Dr. Niles undertook an analysis of a hypothetical vineyard on the Hayes Valley site. This additional analysis has been added to Appendix B of the EIR. (See *Section VI. REVISIONS TO THE APPENDICES OF THE EIR.*) The analysis considered a hypothetical 400 acres of vineyards on the site. Based on current yields and prices, the analysis concluded that it would take at least 10 years before such an operation would reach a break-even position. This is due to the extremely high start-up costs for vineyards, which would total almost $6 million (not including land costs) before the first harvest in the third year of operation. While a vineyard would ultimately be profitable, the conclusion reached was that such an operation would not be financially justified given the opportunity cost of capital and the risk of the operation.

C. LAND USE

General Overview of the Issue

There is a concern that this development is too intense and therefore is not compatible with the rural character of San Martin.

Background

The project consists of a number of elements including 41 residences, a golf course with a clubhouse, and 45 units of overnight accommodation, along with auxiliary uses such as an equestrian center and a swim and tennis center. All of these uses are permitted by the Hillsdale (HS) zoning ordinance which applies to the site.

Major Comments and Responses

1. **This project is urban in scale and intensity and thus is not compatible with this rural area.**

Response

The project includes a large acreage, but it also demonstrates how the hillside cluster ordinance operates to concentrate permissible development in a confined area while preserving the vast majority of the site as permanent open space. The slope density formula in the Cluster Ordinance determined that minimum residential densities on the site to be one lot per 36 acres, resulting in 35 Hillside cluster lots (the remaining 6 lots are in an existing Rural Residential area not subject to the slope-density formula). This is a very low density relative to other residential areas of San Martin.

In terms of overall intensity of the development, the total coverage of buildings is 1.5 percent over the 410-acre development area (including the 263-acre golf course area), and 0.4 percent of the total site area. The total coverage by all impervious surfaces, including all structures, roads, cart paths, driveways, and parking areas, is 6 percent over the 410-acre development area and 1.5 percent of the total site area. Compared with 40 to 50 percent for a typical suburban subdivision, and 80 to 95 percent for industrial park or commercial retail development, the proposed coverages do not represent a large scale or intensive development.

2. This project would set a precedent for large scale intensive development in the County.

Response

As discussed in Section II of the DEIR, the proposed project conforms with the "Hillsides" designation of the County General Plan, and the provisions of the Hillside (HS) Zoning District. Section 14-4.2(b) of the HS zoning regulations specifically permit all of the uses proposed including clubhouse, overnight accommodations, swimming pools, tennis courts, and bar and restaurant. Also permitted under HS zoning regulations are corrals and caretakers residences. Thus the proposed project is not an inappropriate use for the site according to the applicable County General Plan and zoning requirements.

Although a specific project including a golf course and residential subdivision may not have been previously proposed in the County, it has been a permitted combination of uses in HS zone for many years. Therefore, it would not be precedent-setting in the sense that it would represent a combination of land uses not previously permitted in the County. It just happens to be the case that no project has been previously brought forward which seeks to fully utilize the provisions of the applicable General Plan and zoning.

3. The proposed overnight accommodations are an inappropriately intense and commercial use.

Response

Section 14-4.2(b) of the County's Hillside zoning regulations specifically permit overnight accommodations within the HS zone. There is a pending County study to determine the appropriate size of ancillary facilities, including overnight accommodations, that should be constructed in conjunction with golf course development. On April 18, 1995, the Board of Supervisors approved the recommendation of the Planning Commission that pending golf course use permit applications (specifically the Lion's Gate and Los Gatos County Club projects) not be required to wait for completion of study of "Hillsides" zoning ordinance, as recommended in General Plan implementation recommendation R-LU(i) 9. This implementation was to specify maximum permissible sizes of facilities allowed in conjunction with golf courses, including clubhouses, overnight accommodations, and restaurants. The Planning Commission findings in support of the recommendation stated that the

golf course proposals did not involve facilities that appeared to be out of scale relative to the size of the golf courses. It is important to note that, at that time, the proposed Lion's Gate project included 60 units of overnight accommodation, which has since been scaled back to 45 units.

The finding required in the HS section of the zoning ordinance to determine the appropriateness of the overnight accommodations is that they be "consistent with both the scale of the golf course development and the rural character of the zoning district." The proposed overnight accommodations would be constructed as a series of adobe cottages following the natural contours. Having a low profile with much variation in building planes and rooflines, these units would not appear as a massive hotel but would blend in with the surroundings. The total floor area of the overnight complex would be approximately the same as the clubhouse and thus would be consistent with the scale and the character of the clubhouse, which also would be built in adobe style.

At 34,000 square feet, the overnight complex would represent 0.3 percent of the total golf course area, 0.2 percent of the total development area, and 0.05 percent of the total site area. Thus it would not represent an intensive use of the site.

D. GROWTH INDUCEMENT

General Overview of the Issue

There is a concern that the golf course could be redeveloped in the future for a residential subdivision, and that the proposed package wastewater treatment plant would be expanded to accommodate future growth in San Martin.

Major Comments and Responses

1. The golf course could be redeveloped for residential use in the future.

Response

There is a very low probability that the golf course would be redeveloped for another use. Considering the effort and expense of gaining project approval for the golf course, and the huge investment required to construct a premiere facility, it makes no sense to turn around and try to develop the site for something else. Under the HS zoning, the golf course area could be developed for 13 cluster lots at most, which does not provide a financial incentive for converting the golf course. Any proposal for a more intensive development would require a General Plan amendment to Rural Residential, but the General Plan specifically prohibits the creation of new Rural Residential areas or the expansion of existing Rural Residential areas.

2. The package wastewater treatment plant could be expanded to accommodate future growth in San Martin.

It would be difficult to expand the treatment system once it is installed. All of the components of the package wastewater treatment facility would be sized to serve only the Lion's Gate project. That is, the treatment capacity would be limited to 30,000 gallons per day, which represents the peak daily flows from the project as proposed. It would be very difficult, if not impossible to add to the system at

a later date to accommodate additional development. The proposed treatment plant site is in a constrained location with no area available for expansion. Additionally, it would not be possible to expand the effluent disposal pond given its location on top of a knoll, and there are no suitable locations for additional ponds nearby. Also, new pipeline would have to be laid and pump stations added. It is unclear what the incentive would be to the homeowners association and the country club for tolerating the inconvenience and nuisance of a system expansion that would not benefit them.

Even if a treatment plant expansion were to be proposed, the operating permits from the County Department of Environmental Health and the Regional Board would require modification, and the required expansion of the Community Services District would require the approval of LAFCO.

III. COMMENT LETTERS AND RESPONSES

This section contains copies of the written comments received on the DEIR, as well as the responses to those comments. The individual comment items are numbered in the margins of the comment letters, with the corresponding responses appearing on the facing page.

To facilitate cross-referencing, each response has an alpha-numeric identification corresponding to the comment and the item number. Thus Response A.4 is the response to item "4" in comment letter "A."

Public comment is important for two reasons. First, comments add information to the public record which is used in the decision-making process. Comments require written responses which clarify EIR statements or expand discussion. Comments may also present new useful information for consideration. Second, public comment provides a gauge of public opinion and lets decision makers know the community reaction to a proposed project.

Responses were prepared only for comments which refer to a specific substantive item or aspect of the DEIR. Comments such as "I am opposed to the Lion's Gate project," state opinion and feeling about the project and are helpful for decision-makers to decide the fate of the project. Unfortunately, comments of this nature do not provide specific comment on the EIR or environmental issues, and thus are difficult to respond to. However, opinion comments are published in the EIR for the record.

A

STATE OF CALIFORNIA - THE RESOURCES AGENCY PETE WILSON, Governor

DEPARTMENT OF FISH AND GAME
POST OFFICE BOX 47
YOUNTVILLE, CALIFORNIA 94599
(707) 944-5500

May 6, 1996

Ms. Jaunell Waldo
County of Santa Clara
70 West Hedding Street
San Jose, California 95126

Dear Ms. Waldo:

SCH 94043016 - Draft Environmental Impact Report (DEIR)
Lion's Gate Reserve

Department of Fish and Game personnel have reviewed the Draft EIR for the proposed Lion's Gate Reserve project. The 1,676-acre project site is located west of San Martin in southern Santa Clara County and has been used for agriculture and cattle grazing. The West Branch of Llagas Creek runs through the property. The project consists of an 18-hole golf course with ancillary facilities, 41 custom home lots, and an equestrian center. An area of 1,265 acres would be set aside as private open space.

We believe that the document in its present form does not adequately address impacts to biological resources, and does not provide adequate measures to avoid significant impacts and mitigate unavoidable impacts. The reasons for this assessment are as follows.

1

1. Impacts to wetlands on the site could be reduced by modification of the project design without affecting the feasibility of the project. For instance, the maintenance access road to Watsonville Road should be realigned to avoid the existing seasonal wetlands. Based on the floristic analysis, these wetlands appear to qualify as vernal pools, a scarce community type which needs to be protected.

2

2. It appears that the golf course design will have unnecessary impacts on riparian habitat. Use of a "links" design would reduce the need for pesticide and fertilizer use and minimize the extent of grading. Holes which span the main creek or tributaries should be redesigned to eliminate the span in order to reduce the potential for loss of habitat and human intrusion. The proposed prohibition on golfers entering the riparian zone to retrieve lost balls is unenforceable and does not address the problem.

A. Response to Department of Fish and Game

NOTE

Since the time that this comment letter was received, DFG biologist Jeannine DeWald met with the biological consultant at the site on June 24 to review the concerns expressed in that letter. As a result of the clarifications provided in that meeting, and the recently completed refinements to the project and biological mitigations, as discussed in the responses below, the DFG representative indicated general satisfaction with these clarifications and mitigations. A confirmation letter regarding the above is currently being prepared by DFG.

1. Comment acknowledged. It has been the applicant's intent to route the maintenance access road around the seasonal wetlands, although this is not reflected in the site plan or in the biological analyses contained in the DEIR. Accordingly, the site plan and biological discussion have been revised to reflect the intended avoidance of these seasonal wetlands. (See Section *V. TEXT AMENDMENTS*.)

2. The golf course plan includes 97 acres of irrigated fairways and roughs, and does not include maintained turf areas between fairways. The practice of irrigating between fairways is common in older courses typically results in over 120 acres of irrigated turf. With respect to pesticide and fertilizer use, chemical applications would be carefully programmed and minimized in the proposed integrated pest management plan, which emphasizes cultural practices and other techniques to minimize pesticide use. Those measures include: selecting species that are pest resistant and have low nitrogen requirements; minimizing fertilization in the winter when growth rates are low; application of pesticides, fungicides and herbicides sparingly and only in response to an identified problem, rather than on a preventative basis; application of irrigation water to match plant needs so little or no water seeps below the root zone; and other non-chemical measures to maintain healthy turfgrass.

   The proposed golf course plan shows two holes which would cross the main creek channel. Both of these holes include several tee boxes, including tees on the opposite side of the creek. This provides golfers with the option of not playing over the creek channel. Signs would be posted prohibiting golfers from retrieving their balls from the riparian area. The tendency for unauthorized incursions would be further reduced by not assessing a penalty stroke for balls hit into the riparian zone and left there. As discussed in the biological resources section of the DEIR, the on-site riparian areas are severely degraded and have minimal habitat value. The plant species found along the creek channel are those commonly associated with the adjacent non-native annual grassland. The project includes a riparian restoration and enhancement plan, which together with the removal of cattle grazing would result in the establishment of viable riparian habitat. However, no tree or shrub planting is proposed at the points where the two holes play across the creek channel. The occasional unauthorized incursion by golfers into these limited crossing areas would not result in significant impacts to the creek-side habitat. In addition, information would be distributed to golfers regarding the course's membership in the Audubon Sanctuary Program, and the value of the riparian corridor and the importance of not entering it.

3. Mitigation ratios for loss of riparian habitat are not acceptable. We commonly require replacement of habitat acreage (rather than trees) at a ratio of 3:1. This is a long-established standard for riparian replacement. The argument for a reduced riparian setback is also unconvincing. One of the functions of the setback is to protect species which are sensitive to human disturbance from contact which could disrupt normal behavior patterns. In an area which is not densely vegetated, distance is crucial to the performance of this function. We believe that the standard 100-foot setback should be required as a minimum. 3

4. The mitigations incorporated in the project for California tiger salamander are not adequate. The DEIR proposes erection of a fence to force estivating salamanders to move out of the construction area, but does not consider whether sufficient suitable habitat will be available or whether the relocation itself could result in mortality. The proposed introduction of salamander larvae to two currently existing but unused stock ponds is also a questionable undertaking unless it can be demonstrated that the ponds are in fact suitable habitat. Unoccupied habitat is generally unoccupied for a reason. 4

5. The preservation of Pond 1 for pond turtles is valuable, but may not be adequate. Unless sufficient nesting and estivating habitat is available, the population will eventually die out. 5

6. The Morgan Hill area is an important component of burrowing owl habitat in the South Bay area. Burrowing owls in this area form a subpopulation which exchanges immigrants with San Jose owl populations, helping to preserve the long-term viability of the regional owl population. Preservation of owl habitat on the project site is therefore important. With the removal of grazing, grasslands on the site are likely to become overgrown and cause loss of habitat value for owls. Ground squirrel control on the site would also adversely affect burrowing owls, as well as badgers and California tiger salamander. We strongly recommend that a habitat management plan be developed and implemented to provide long-term habitat maintenance for these species. This would include (but not be limited to) maintenance of vegetation in a suitable condition through mowing or grazing, maintenance of ground squirrels on the site, and aggressive control of bullfrogs throughout the project site. 6

7. The actual level of protection given to serpentine habitat is somewhat nebulous. We recommend that the area be demarcated by a permanent fence to prevent accidental intrusion, and that 7

3. H.T. Harvey recently completed a reassessment of potential project impacts to the riparian habitat of the Lion's Gate site. The initial assessment of riparian impacts by H.T. Harvey was based on the analysis of an aerial photograph and an earlier version of the project site plan. The site plan has since been modified to avoid some direct impacts and to reduce the dewatering effects by maintaining creek flows in tributaries that were previously shown as being filled. In addition, the accuracy of the impact assessment was improved with more precise measurements of canopies in the field that was not possible using the aerial photographs. Also, one group of trees which appeared to be under riparian influence on the aerial photograph was found to be in upland habitat when examined in the field. As a result of the above plan refinements and more accurate measurements, the impact to riparian vegetation is 0.50 acres of vegetation removal and 0.33 acres of vegetation that becomes non-riparian as a result of channel dewatering, for a total of 0.83 acres of impacts. Since the riparian restoration and enhancement plan includes 2.5 acres of replacement planting, this would satisfy the 3:1 replacement ratio. The EIR has been revised to include this updated information. (See Section *V. TEXT AMENDMENTS.*)

With respect to riparian setback, the suggested 100-foot setback may be appropriate where there is a well-developed riparian corridor which provides high habitat value. However, the value of the habitat is largely dependent on the floristic and structural diversity of the riparian zone. The riparian habitat on-site consists mainly of a few isolated valley oaks and sycamores that lack an understory. The wildlife value of these riparian woodlands is substantially less than the less disturbed riparian woodlands in the region (i.e., portions of Llagas Creek, Little Arthur Creek, etc.). The on-site riparian areas are used much less frequently and by fewer species of wildlife than those other less disturbed riparian habitats. Therefore, the reduced setbacks proposed in the DEIR would adequately off-set impacts to these degraded riparian habitats. It should also be noted that no buildings are proposed within 100 feet of the channel, and parking lots would be set back at least 75 feet. Thus only turfed areas would be located less than 75 feet from the creek channel. As noted in the DEIR, turfed areas along the riparian corridor are used by wildlife and do not inhibit wildlife movement along the creek.

4 The project proposes several measures to mitigate impacts to the California tiger salamander. This includes preservation of existing breeding habitat (ponds 1, 3, 6 and 7), preservation of two existing ponds which provide potential breeding habitat (ponds 4 and 5), construction of two new ponds to mitigate for the loss of pond 2, and the preservation of upland retreat habitat at a greater than 1:1 ratio. The introduction of salamander larvae to ponds 4 and 5 from pond 2 (the pond to be filled) is only one component of the overall CTS mitigation plan. The fact that CTS larvae were not found in these ponds during a reconnaissance level survey (1 visit) using a dip net does not mean they are not present. LSA's experience with long-term monitoring of known breeding ponds in the Livermore Valley of Alameda County indicates CTS do not successfully reproduce every year in a given pond. They have also found that dip netting the margins of a pond can result in no captures while use of a seine or drop net results in captures. Ponds 4 and 5 appear to be physically suitable breeding ponds.

5. The project proposes more mitigation than is referenced in this comment. Pond 1 would be preserved and upland habitat suitable for nesting would also be preserved in its vicinity. A second pond suitable for use by pond turtles would be constructed in project open space. This pond would be constructed upstream of the existing pond resulting in a direct hydrological link and providing a secure movement corridor between the two ponds.

the project proponent be responsible for preventing the intrusion of grading activity connected with future home construction on Lots 7 and 8.

8

8. The potential occurrence of the longhorn fairy shrimp and vernal pool fairy shrimp on the project site needs to be addressed further. The DEIR concludes that neither species is present based on "preliminary" or "reconnaissance-level" surveys and known species distribution. Known distribution is not a reliable indicator when the species is as poorly known as these fairy shrimp. We recommend either more complete documentation of why the habitat is not suitable, or focused surveys. The Federal status of these species and the proposed destruction of the vernal pools make this determination extremely important. Failure to adequately determine occurrence of these species could result in a violation of Federal law if take occurs.

Based on the information provided in the DEIR, we believe that approval of the project in its present form would result in significant adverse impacts. We recommend that consideration of the DEIR be deferred until the issues raised have been addressed, and a revised DEIR has been prepared and circulated for public and agency review.

Thank you for the opportunity to review and comment on this project. If you have any questions or would like to arrange a meeting, please contact Jeannine M. DeWald, Associate Wildlife Biologist, at (408) 429-9252; or Carl Wilcox, Environmental Services Supervisor, at (707) 944-5525.

Sincerely,

Brian Hunter
Regional Manager
Region 3

cc: U. S. Fish and Wildlife Service
Sacramento

Corps of Engineers

6. One Burrowing Owl was detected on-site in 1988. Numerous surveys have been conducted since that time and no other Burrowing Owls have been detected on-site. Therefore, while portions of the site (primarily the grasslands of the valley) support suitable habitat, owls have not bred or wintered on-site since at least 1988. Nonetheless, the DEIR recognizes the possibility that Burrowing Owls may use the site in the future and thus calls for pre-construction surveys to ensure that breeding owls (or their eggs or young) are not adversely effected by project construction. Although grazing would be discontinued on the site, the extensive remaining grasslands on the site would be mowed regularly to reduce fire hazard.

   Although the site does not currently have a large ground squirrel population, efforts to control them would only take place within the golf course area itself.

   As noted in the "California Tiger Salamander and Western Pond Turtle Mitigation Plan" contained in Appendix F of the DEIR, the monitoring program includes measures for searching and removal of bullfrogs and their tadpoles.

7. As noted under Mitigation 8 on page 133 of the DEIR, the serpentine area would be fenced both during construction and after construction to prevent incursion. As a practical matter, it is unlikely that grading activity would approach the serpentine boundary which occurs in the steeply sloping areas at the rear of two substantial sized lots (minimum 2 acres). After construction is complete, a permanent fence would be erected along the serpentine boundary, and signs would be posted as part of a public education program designed to sensitize the residents about the habitat value of this area.

8. According to H.T. Harvey and Associates and LSA Associates, the project site is unlikely to support the listed species of fairy shrimp for the following reasons: 1) none of the listed species have been observed within Santa Clara County; 2) the pools on the property are fairly degraded; and 3) natural conditions on the site would not have included conditions favorable to supporting native populations on the site. None of the listed vernal pool invertebrates are known to occur within the Santa Clara County. The nearest observations were the vernal pool tadpole shrimp *(Lepidurus packardi)* in southern Alameda County (at Warm Springs Seasonal Wetland near Fremont, Caires et al. 1993), and the vernal pool fairy shrimp *(Branchinecta tynchi)* in Pinnacles National Monument in southern San Benito County (C. Nagano, USFWS, pers. comm.) and Fort Hunter Liggett in southern Monterey County (CNDDB). The longhorn fairy shrimp (*Branchinecta longiantenna*) has one of the most restricted ranges of the listed fairy shrimp. The longhorn fairy shrimp is known from only four populations: Kellog Creek Watershed, Altamont Pass, Carrizo Plain, and Kesterson Reservoir. The California linderiella *(Linderiella occidentalis)* occurs in Santa Clara County. However, this species was not listed because it was found to be have a broad distribution and was relatively common within its range (USWFS 1994). These distributions are based on the best scientific and commercial evidence (as outlined in the Federal Endangered Species Act) during the listing process and during extensive surveys that have been conducted statewide since the listing of these species has occurred.

   Pools on the Hayes Valley property are fairly degraded with a dirt access road passing through several of the pools. These areas appear to be man-made and seem to have resulted from channelizing of Hayes Creek, mounding of the fenceline and grading of the access road.

   None of the seasonal weltands on the site are conducive to supporting populations of the listed fairy shrimp. The stock ponds on the site are not considered fairy shrimp habitat because they hold water for too long a period for conditions to be right for fairy shrimp. The seasonal

BLANK PAGE

wetlands in the vicinity of Watsonville Road were created by the interruption of natural drainage in that area. These areas did not historically pond water although there may have been some surface saturation. Therefore, it is unlikely that the listed fairy shrimp would have been native to the site. Since there are no nearby populations of listed fairy shrimp, there is no way that the artificially created seasonal wetlands would have become colonized.

B

STATE OF CALIFORNIA — PETE WILSON, Governor

NATIVE AMERICAN HERITAGE COMMISSION
915 CAPITOL MALL, ROOM 364
SACRAMENTO, CA 95814
(916) 653-4082

April 9, 1996

Jaunell Waldo
Santa Clara County Office of Advance Planning
County Government Center, East Wing
70 W. Hedding Street
San Jose, CA 95110

RE: Draft EIR Lion's Gate Reserve (Hayes Valley) Golf Course

Dear Ms. Waldo:

On reading the above referenced Draft EIR, I notice that on page 141 Mitigation 2(b), it states that if *any human remains are discovered they shall be removed, the remains shall be analyzed, a report shall be prepared, and if determined to be Native American, the remains shall be reburied under the direction of a designated Native American group.* To be clearly understood this mitigation statement needs clarification.

1 Section 7050.5 (b) of the Health and Safety Code and Section 5097.98 (a)(b) of the Public Resources Code clearly states the steps that are to be taken if human remains are found. The statement in the EIR is not clear regarding the removal of remains immediately upon discovery. Secondly, the narrative states that the remains shall be analyzed. This needs clarification, as to what type of analysis is intended. Finally, remains are reburied under the direction of a Most Likely Descendant(s) (Public Resources Code 5097.98)(a)(b).

Please feel free to call me if you have any questions.

Sincerely,

Gail McNulty

Gail McNulty
Associate Program

B. Response to Native American Heritage Commission

1. Comment noted. The referenced mitigation measure has been revised to more closely correspond to the language in the cited legislation. (See Section V. *TEXT AMENDMENTS.*)

State of California PETE WILSON, *Governor*

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD -- CENTRAL COAST REGION
81 Higuera Street, Suite 200
San Luis Obispo, CA 93401-5414
(805) 549-3147

May 2, 1996

Ms. Jaunell Waldo
Santa Clara County Office of Advance Planning
County Government Center, East Wing
70 W. Hedding Street
San Jose, CA 95110

Dear Ms. Waldo:

Thank you for the opportunity to comment on the Draft Environmental Impact Report (DEIR) for the Lion's Gate Reserve (Hayes Valley) Golf Course project. Overall, the project appears environmentally conscientious. Based on our policies and experience, we offer the following comments:

1 Project Description, Page 24: Equestrian Center
The DEIR states that any proposal to compost manure would require approval from the Department of Environmental Health Solid Waste Unit. The Regional Board also regulates composting operations.

2 Project Description, Page 24: Maintenance Facility
The maintenance facility includes an "advanced wash water filtering and recycling system". That system will produce sludge and wastewater. The sludge and wastewater will contain detergents, oils, and other contaminants. The DEIR does not state how the waste products will be handled.

3 Project Description, Page 27: Drainage
The DEIR states that there are several instances where short reaches of tributary drainage would be rerouted or piped to accommodate fairway layout. Any loss of overall infiltrative capacity should be mitigated.

4 Project Description, Page 27: Residential Drainage
The DEIR states that the drainage from the rural residential subdivision located north of Highland Avenue would be conveyed directly to the reach of West Branch Llagas Creek. A direct conveyance indicates that no treatment for urban runoff, or siltation will occur. All stormwater impacts resulting from the project should be mitigated.

5 Project Description, Page 31: Fertilization

The DEIR states that soils will be tested regularly for potential nitrogen buildup. That language seems vague and does not provide assurance that sampling and testing will occur with an appropriate frequency.

6 Project Description, Page 31: Pest Management
The DEIR states that an area will be provided for mixing and loading of pesticides. The DEIR should describe the fate of spilled pesticides and washdown water from the pad.

C. Response to Regional Water Quality Control Board - Central Coast Region.

1. Comment noted. The EIR has been revised to include this additional information. (See Section *V. TEXT AMENDMENTS)*

2. The treated water from the system would be recirculated for reuse in equipment washing. The accumulated sludge and other wastewater constituents would be dewatered and dried to a solid state and disposed of at a landfill.

3. The minor loss of infiltration capacity would be more than compensated for by the stormwater retention basins to be created.

4. The DEIR incorrectly stated that drainage from this area would be conveyed to the creek. The project engineer, Forsgren Associates, indicates that the drainage from this area would be conveyed to a small retention basin to be constructed in the northwestern portion of this area. The EIR has been revised to include this corrected information. (See Section *V. TEXT AMENDMENTS.)*

5. The sampling frequency for nitrogen recommended by Audubon Conservation Services is quarterly sampling during the first three years of operation, and semi-annually after that. The EIR has been revised to include this new information. (See Section *V. TEXT AMENDMENTS.)*

6. The washwater and hazardous materials treatment and recycling system is described on page 25 of the DEIR under "Maintenance Facility." This description has been expanded to discuss the fate of materials collected by the treatment equipment. (See Section *V. TEXT AMENDMENTS.)*

Project Description, Page 34

7 Our authority also includes protecting surface and ground water quality from nonpoint sources.

Section III.F. Water Quality, Page 97, Impact 2

8 The narrative states that several tributary swales would be piped within proposed fairways. Piping of the swales eliminates the environmental benefits of the swale. It is not clear whether or not these piped swales were included in the calculations for loss of riparian areas.

Section III.F. Water Quality, Page 97, Mitigation 3

Sheet flows over the clubhouse and practice range parking lots will contain common urban runoff contaminants. The narrative states that the stormwater would percolate into the soil or evaporate. One would expect the same fate for the contaminants. Undoubtedly some biodegradation would occur with respect to organic contaminants. However some organic and inorganic contaminants could migrate to ground water or accumulate in the basins.

9

The narrative states that the basins would be cleaned of accumulated debris as needed. It seems that the basins would only be cleaned if massive siltation or large debris were observed visually. Such occurrences are not likely and the basins are not likely to be cleaned for many years. During that time it is conceivable that an accumulation of urban runoff contaminants could result in an unwanted situation. Installation of floatables/settleables traps at the parking lot collection points could separate out some contaminants before the runoff enters the retention basins, thereby reducing the amount of contaminants entering the retention basin. Such traps would necessitate periodic inspection and cleaning.

10 Section III.F. Water Quality, Page 99, Mitigation 4

The narrative discusses the use of a computerized irrigation control system. As stated in the Project Description, there are many variables that affect the effectiveness of the computerized system and that fine-tuning of the irrigation program would be essential. The discussion of the computerized irrigation system does not instill confidence that the system will meet the expectations described in the DEIR. Aside from the DEIR's claim that little or no water will seep below the root zone, there should be some assurance that the system will operate as intended.

Section III.F. Water Quality, Page 101, Mitigation 4, Monitoring

11 The DEIR states that four new wells will be installed for sampling and testing ground water. Although a ground water monitoring well may be identified as a "background" or "downgradient" well prior to its installation, it is not assured that the well will actually represent background or downgradient water quality. The direction of ground water movement does not always correlate to surface topography nor does it ensure that you are even sampling the same ground water. Therefore the determination of whether or not the wells are appropriately sited can only be made after an adequate evaluation of sufficient hydrogeologic information. The four wells depicted in the DEIR may or may not be appropriate to accomplish the intended goal.

Section III.F. Water Quality, Page 104, Mitigation 6

12 The DEIR discusses manure management, but failed to address equine urine management. Although manure will be picked up and vacuumed up, urine will not. The environmental impacts of equine urine were not discussed.

7. The Regional Board's authority for non-point source control is encompassed by the reference to the NPDES program, as noted on page 34 of the DEIR.

8. The swales to be removed were included in the calculation for loss of riparian areas, to the extent that they include riparian vegetation. All swales to be removed were included for loss of wetlands if they met the Corps' criteria for jurisdictional wetlands under Section 404 of the federal Clean Water Act.

9. Comment noted. The EIR has been revised to note that suggested floatables/settleables traps would be installed in the drainage systems for the parking lots. (See Section *V. TEXT AMENDMENTS.)*

10. The computerized irrigation system would be managed by the golf course superintendent who would be certified in system operation and would have been employed prior to construction of the golf course. As such, the superintendent would gain a detailed understanding of the various soil types and microclimates throughout the golf course as well as the characteristics and requirements of the turf grass varieties used on the tees, greens and fairways. Irrigation water applications would be adjusted for individual areas or zones of the golf course depending on localized conditions and needs. The amount of applied water can even be controlled for each individual sprinkler if necessary. The irrigation system would be linked to an on-site weather station which would provide constant monitoring of weather conditions and would facilitate calculation of evapotranspiration (ET) rates throughout the course. Combined with coefficients for specific turfgrasses provided in the Environmental Management Plan, this data would allow determinations of precise watering requirements for the different parts of the course. The golf course superintendent and irrigation technician would be required to undergo extensive training in the operation of this computerized system prior to the start of golf operations. It is also important to note that there is a strong incentive not to overwater, since it represents and unnecessary expense, and because overwatering creates conditions where fungus can become established.

11. As discussed in the preliminary groundwater investigation by Geoconsultants, Inc., contained in Appendix M of the DEIR, the Hayes Valley aquifer flows from west to east through the project site. Since Hayes Valley contains the headwaters of West Branch Llagas Creek and is confined on the north and south by uninterrupted ridges, there is no doubt that groundwater follows the natural contours downslope to the east.

    Although studies of transmissivity have not yet been conducted, a review of on-site soil types indicates that groundwater on the site would flow in a predictable pattern.

    The well locations shown in Appendix C are based on the best information currently available. The locations of the wells would be fine-tuned during the ASA process once more detailed hydrogeologic information becomes available.

12. The main issue with equine urine is the ammonia and bacteria that are absorbed into the soil where the horses are pastured. During the dry period, a large portion of the ammonia is volatilized. During the wet period, when volatilization is low, there is a greater potential for conversion to nitrogen with some leaching into the soil. However, even under these conditions, equine urine does not represent a significant nitrogen loading factor.

Section III.G. Biological Resources, Page 127, (d)

13 The Regional Board must certify that any permit issued by the U.S. Army Corps of Engineers pursuant to Section 404 of the Clean Water Act (covering dredging or filling of wetlands) complies with state water quality standards, or waive such certification. Section 401 Water Quality Certification is necessary for all 404 Nationwide permits, reporting, and non-reporting, as well as individual permits.

Section III.G. Biological Resources, Page 127, (e)

14 The narrative states that since the quality of the riparian habitat on-site has been degraded due to many years of livestock grazing, smaller buffers would adequately protect existing riparian functions and values. The goals of the California Wetlands Conservation Policy include ensuring "no overall net loss and achieving a long-term net gain in the quantity, quality, and permanence of wetlands acreage and values". It is our experience that riparian areas can quickly rebound from historic, excessive grazing. Although a smaller buffer may protect existing riparian functions and values of the degraded areas, the project offers a prime opportunity to partially mitigate grazing damage and increase wetlands acreage. By maintaining a setback equal to that for the riparian woodland, it is probable that the degraded wetland areas will rebound.

If you have any questions, please call **Tom Kukol at (805) 549-3689** or Brad Hagemann at (805) 549-3697.

Sincerely,

Bradley E. Hagemann

FOR Roger W. Briggs
Executive Officer

TJK\LionDEIR\SJM\p:\cm
Task: 121-01
File: Lion's Gate

13. Comment noted. The DEIR has been revised to include this additional information. (See Section *V. TEXT AMENDMENTS.)*

14. As discussed on page 125 of the DEIR, the project includes a Riparian Habitat Restoration and Enhancement Plan which provides for the re-establishment of riparian vegetation along the on-site reach of West Branch Llagas Creek. In addition, new wetlands would be created by expanding the existing pond and through the creation of three new ponds for tiger salamander and pond turtle habitat.

D

STATE OF CALIFORNIA — ENVIRONMENTAL PROTECTION AGENCY

PETE WILSON, Governor

DEPARTMENT OF TOXIC SUBSTANCES CONTROL

REGION 2
700 HEINZ AVE., SUITE 200
BERKELEY, CA 94710-2737

(510) 540-2122

April 19, 1996

Ms. Juanell Waldo
Santa Clara County
East Wing, 7th Floor
70 West Hedding Street
San Jose, California 94545

Dear Ms. Waldo:

DRAFT ENVIRONMENTAL IMPACT REPORT FOR THE LION'S GATE PROJECT STATE CLEARINGHOUSE NUMBER 94043016

The State Clearinghouse provided the Department of Toxic Substances Control (DTSC) with a copy of the Draft Environmental Impact Report for the above project. DTSC has reviewed the report and with this letter transmits its comments.

1 The soils at the site are likely to contain pesticides resulting from past agricultural operations. No soil samples have been taken and analyzed for contaminants. If these substances are present in the site soils, there would be potential for human exposure to these substances during construction of the proposed project, during subsequent earth-moving activities, and in residential areas where these soils are present.

2 In the context of public health, environmental health, and worker safety, DTSC suggests that prior to commencement of construction, the site soils be thoroughly characterized in order to avoid exposure of construction workers, future residents and users of the facility to potentially hazardous soils. Due to the highly agricultural nature of the project area, DTSC suggests that these samples be analyzed for pesticides and for petroleum hydrocarbons.

3 Enclosed is an order form for DTSC's Preliminary Endangerment Assessment (PEA) Guidance Manual which details the site characterization procedure. Should Santa Clara County or the project proponent desire, DTSC can enter an agreement whereby DTSC will review the PEA for a fee. This is known as the Voluntary Cleanup Program (VCP).

D. Response to Department of Toxic Substances Control

1. Comments noted. These hazardous materials issues have been fully evaluated in Section III. N. of the DEIR.

2. Comment noted. As discussed in the DEIR, soil samples would be tested prior to site clearing, with appropriate remediation measures implemented if necessary.

3. Comment noted. No response required

4 DTSC offers other oversight services under the VCP. Prudent businesses employ these services to responsibly manage releases of hazardous substances (and their associated liabilities) while controlling, via an agreement with DTSC, the kind of regulatory services they desire. A fact sheet describing the Voluntary Cleanup Program is enclosed.

If you have any questions, you may call Ben Hargrove at (510) 540-3845.

Sincerely,

Ben Hargrove
Hazardous Substances Engineer
Site Mitigation Branch

Karen M. Toth
Unit Chief
Site Mitigation Branch

Enclosures

cc: (without enclosure)
Guenther Moskat
Department of Toxic Substances Control
Planning and Environmental Analysis Section
P.O. Box 806
Sacramento, California 95812-0806

State Clearinghouse
1400 Tenth Street
Sacramento, California 95812

4. Comment noted. No response required.

E

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY PETE WILSON, Governo

DEPARTMENT OF TRANSPORTATION
BOX 23660
OAKLAND, CA 94623-0660
(510) 286-4444
TDD (510) 286-4454

May 1, 1996

SCL-101-R12.46
SCH94043016
SCL101373

Ms. Jaunell Waldo
Office of Advance Planning
County of Santa Clara
County Government Center, East Wing
70 W. Hedding Street
San Jose, CA 95110

Dear Ms. Waldo:

Re: Draft Environmental Impact Report (DEIR): Lion's Gate Reserve

Thank you for including the California State Department of Transportation (Caltrans) in the environmental review process. We have reviewed the above-referenced document and wish to forward the following comments:

1

1. There are a number of deficiencies in the DEIR and appendices which make it difficult to thoroughly review the documents. To begin, there should have been a cumulative impact analysis of the project study intersections for project conditions and all approved projects. On page 8, Table II in Volume III entitled, "Approved Projects Trip Generation," the table indicates that 1,010 trips will be generated by all approved projects. It would then follow that there should have been a discussion of the impacts of ALL projects on U.S. 101, since according to page 159 of Volume I, about 40% of the trips are distributed in the mainline. Please clarify.

2

2. Since the above information was not covered and it appears that so much information is either missing or perhaps mislabeled, we find it hard to accept the conclusions reached that there will be no significant traffic impacts to the study intersections. Is the information presented really valid? We refer to Volume I, page 153, section entitled, "Existing Levels of Service," last sentence in second paragraph refers to "calculations" found in Appendix H. On what page are these calculations?

On the same page, last paragraph at the bottom, section entitled,

E. Response to Department of Transportation

1. The Santa Clara County Congestion Management Agency Guidelines for Traffic Impact Analyses indicates that the scoping criteria for evaluating freeway impacts relates only to the proposed project trips and not the total of approved project trips as suggested in the comment. Specifically, if the proposed project is expected to add traffic volumes which exceed 1 percent of the freeway capacity, then that freeway segment should be included in the analysis. In this case, U.S. 101 near the project site provides two lanes in each direction and the 1 percent threshold is 46 vehicles north of Tennant Avenue. Since the project contribution would be lower than this threshold, no detailed analyses of U.S. 101 were conducted.

2. The detailed intersection analyses are contained in Appendixes A through E of the TJKM Traffic Study, which is contained in Appendix H of the DEIR.

3 " Background Traffic-Existing Plus Approved Projects," last sentence refers to "a table of these approved projects and a figure...in Appendix G of this EIR." There is no such table in Appendix G, the Historical and Architectural Evaluation section. Could this be a reference to the "missing" Figure 3 in Appendix H?

4 There are other missing figures in Appendix H, which, again, makes it difficult to adequately review and compare the data. The following are missing :

a. Figure 1: existing transit routes in vicinity of proposed project
b. Figure 3: locations of approved projects near study area
c. Figure 4: project turning movement volumes
d. Figure 6: trip distribution assumptions
e. Figure 7: projected study intersection turning movements for existing plus approved plus project
f. Figure 8: forecasted turning movement volumes

Is it possible that some of the figures in Volume I of the DEIR, i.e., figures 18, 19, or 20, should have been the figures provided in items b, c, d, e above? Please clarify.

We appreciate the opportunity to work with you on this project and wish to continue close correspondence on any new developments. Should you have any questions regarding these comments, please contact Salimah As-Sabur of my staff at (510) 286-5583.

Sincerely,

JOE BROWNE
District Director

By: Phillip Badal

PHILLIP BADAL
District Branch Chief
IGR/CEQA

cc: Dana Lidster, SCH

3. The reference to Appendix G should have read "Appendix H." The table listing the approved projects is identified as Table II of the traffic report in Appendix H. The EIR has been revised to include this corrected information. (See Section *V. TEXT AMENDMENTS.)*

4. Comment acknowledged. All but one of the figures prepared by TJKM for Appendix H were inadvertently omitted from DEIR Volume III. Several of these missing figures appear in Volume I of the DEIR as follows: the missing Figure 1 in Appendix H is the same as Figure 17 in the DEIR; Figure 2 is the same as Figure 18; Figure 4 is the same as Figure 19; Figure 6 is the same as Figure 20; and Figure 7 is the same as Figure 21 in the DEIR. Figures 3 and 8 are missing altogether. The EIR has been amended to include the figures missing from Appendix H. (See Section *V. TEXT AMENDMENTS.)*

F

Santa Clara Valley Water District

5750 ALMADEN EXPRESSWAY
SAN JOSE, CA 95118-3686
TELEPHONE (408) 265-2600
FACSIMILE (408) 266-0271

AN AFFIRMATIVE ACTION EMPLOYER

May 3, 1996

Ms. Juanell Waldo
Santa Clara County Office
of Advance Planning
County Government Center, East Wing
70 West Hedding Street
San Jose, CA 95110

Dear Juanell:

Subject: Draft Environmental Impact Report (DEIR) for the Lions Gate Reserve Golf Course

The District has reviewed the subject document and has the following comments:

Section III E. - Hydrology and Drainage

1 We note that the proposed drainage will be designed to mitigate impacts due to the golf course development and are intended to decrease flooding and runoff impacts on downstream properties. If opportunities are found during the design phase to provide additional detention/retention on site, downstream property owners could be provided additional relief from existing flooding impacts.

2 In conjunction with the design of the drainage facilities, operating rule curves, and a manual for operations, maintenance and management safety should be prepared and provided to this District for review and comment.

3 A District construction permit is required for work adjacent to West Branch Llagas Creek.

Section III F. - Water Quality

4 Page 96, Mitigation 1: This mitigation measure includes the implementation of a comprehensive erosion control program and Storm Water Pollution Prevention Plan (SWPPP). It is stated that the implementation of the SWPPP would be subject to inspection by the Regional Water Quality Control Board (Regional Board) and the Santa Clara ValleyWater District (District).

F. Response to Santa Clara Valley Water District

1. Comment noted. No response required.

2. Comment noted. The details of the drainage design for the project would be worked out during the engineering design process.

3. The requirement for a District construction permit is noted on page 34 of the DEIR.

4. See following page for response.

4 The District may conduct construction inspection activities at the proposed site in the case that equipment is operated in, or in the immediate vicinity of, a waterway. However, the District does not have the authority to inspect SWPPPs or otherwise oversee their implementation. SWPPPs are prepared and implemented as a provision of the Statewide NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Permit). The Regional Board and/or the State Water Resources Control Board are the agencies with the authority over SWPPPs and other requirements of the General Permit. We recommend that clarification be added to this section to reflect this fact.

Page 98. Impact 4 and Mitigation 4

5 1. The proposed mitigation appears to be sufficient to minimize the impact of nitrogen fertilizers on the groundwater resource.

2. The proposed groundwater monitoring wells are not located in the proposed turfgrass area (see Volume II, Appendix E, Figure 8). To better determine the effects of golf course
6 operations, groundwater monitoring should be conducted *in* the fertilized turfgrass areas not *near* turfgrass areas. Monitoring in turfgrass areas will give a rapid indication of any improper fertilizer application. Vadose zone monitoring (such as the use of suction
7 lysimeters) is also recommended so that problems can be detected before groundwater is impacted.

Section III. P. Water Supply, On-Site Groundwater

8 1. This section references "4 agricultural wells on the site which were previously used for irrigation supply, but are no longer in use."

Please be aware that water supply wells that have not been used for a period of one year or more are considered abandoned and are therefor in violation of District Ordinance 90-1.

District staff will work with the current property owner to bring the wells into compliance.

We appreciate the opportunity to review this document.

Sincerely,

Usha Chatwani

for Sue A. Tippets, P.E.
Supervising Engineer (Acting)
Design Coordination Unit

4. Comment noted. The EIR has been revised to include the corrected information. (See Section *V. TEXT AMENDMENTS.)*

5. Comment noted. No response required.

6. The precise locations of the monitoring wells would be fined-tuned during the ASA process once more hydrogeologic information becomes available. Creating the wells in the turfgrass areas as suggested should not compromise the groundwater information obtained from the site.

7. Monitoring within the vadose zone (the area between the root zone and the water table) is not recommended by Audubon Conservation Services, the preparer of the Environmental Management Plan contained in Appendix C of the DEIR. The disadvantage of using lysimeters is that they provide very localized data for one point in the profile, whereas monitoring of the groundwater provides an integrated sample from all surrounding sources and thus is more representative of the complex soil and water dynamics. To be statistically significant, a large number of lysimeters would need to be installed over a large area. Reliance on a few lysimeters could result in false positive or false negative results, and may not be reflective of conditions a short distance away. This might lead to unnecessary actions in the case of false positives, or failure to take action in the case of false negative results. It is also important to remember that the edge of the turfed area would be almost one-half mile from the eastern site boundary.

8. Comment noted. No response required.

G

County of Santa Clara

Environmental Resources Agency
Department of Environmental Health
Central Office - 2220 Moorpark Avenue, East Wing, Room 100

P.O. Box 26070
San Jose, California 95159-6070
(408) 299-6060 FAX 298-6261

MEMORANDUM

DATE: May 3, 1996

TO: Juanell Waldo

FROM: Art Kaupert AK
Sr. Environmental Health Specialist

SUBJECT: Draft Environmental Impact Report for the Lions Gate Reserve (Hayes Valley) Golf Course

The Department of Environmental Health has reviewed the subject Draft EIR and offers the following comments for your consideration.

1. In section III. N. Hazardous Materials it should be noted that closure/removal of the existing underground and above ground chemical/fuel storage tanks must be completed under permit issued by the Department of Environmental Health Hazardous Materials Compliance Division (HMCD). The tanks may not be moved, even for reuse with out HMCD authorization.

1

2. It is stated that the annual wet weather waste water volume plus rainfall can be disposed by irrigation during the eight month dry period. The proposed storage capacity of the waste water storage pond is 90 days, however the wet period is 120 days. The waste storage capacity of the pond should be 120 days of sewage flow plus rainfall. (page 193, Long-term Wet Weather Storage, and page 199, mitigation 4)

2

G. Response to County of Santa Clara Department of Environmental Health

1. The EIR has been revised to include the suggested information. (See Section *V. TEXT AMENDMENTS.)*

2. The 120-day storage period assumes a very wet winter when no spray irrigation whatsoever will be possible during the rainy season. During such a wet winter, the golf activity would also decrease, resulting in a reduction of wastewater flows. For such a scenario, it is not unrealistic to expect a flow reduction to 18,000 gallons per day, in which case the storage capacity of the pond would provide for 120 days of storage. During the final design of the wastewater facilities, the water balance would be more precisely recalculated to consider 120-day storage for reduced winter flows.

H

County of Santa Clara

Environmental Resources Agency

Integrated Waste Management Program (408) 441-1198
Pollution Prevention Program (408) 441-1195
1735 North First Street, Suite 273
San Jose, California 95112
FAX (408) 441-0365

May 2, 1996

Jaunell Waldo
Santa Clara County Office of Advance Planning
County Government Center, 7th Floor, East Wing
70 W. Hedding Street
San Jose, CA 95110

Subject: Draft Environmental Impact Report for the Lion's Gate Reserve (Hayes Valley) Golf Course (file #4039-67-28-93)
SCH #94043016

Dear Ms. Waldo:

1 The Santa Clara County Integrated Waste Management Program has reviewed the Draft Environmental Impact Report for the Lion's Gate Reserve (Hayes Valley) Golf Course (DEIR). We believe the DEIR adequately addresses the issues of waste stream reduction, recycling, composting, collection and disposal, and have no comments.

Thank you for the opportunity to review this project.

Sincerely,

Paula Stoner

Paula Stoner, Management Analyst
Integrated Waste Management Program

8-013

H. Response to County of Santa Clara Integrated Waste Management Program

1. Comment noted. No response required.

County of Santa Clara

Environmental Resources Agency
Parks and Recreation Department

298 Garden Hill Drive
Los Gatos, California 95030
(408) 358-3741 FAX 358-3245
Reservations (408) 358-3751 TDD (408) 356-7146

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April 20, 1996

Jaunell Waldo
Santa Clara County Office of Advance Planning
County Government Center, East Wing
70 W. Hedding Street
San Jose, CA 95110

Subject: **Draft Environmental Impact Report for the Lion's Gate Reserve (Hayes Valley) Golf Course**

Jaunell Waldo:

Following are our comments on the Draft Environmental Impact Report for the Lion's Gate Reserve (Hayes Valley) Golf Course. Our comments are focused on the DEIR's discussion of Parks, Trails and Public Recreation.

1 We have reviewed the subject DEIR. This setting of the document accurately identifies all the existing County Parks in the vicinity of the subject project. This discussion also addresses the fact that there are currently no public trails in the south county connecting these regional public parks. However, the ***Section II, Consistency with Plans, Policies and Regulations*** of the DEIR includes a discussion of the trail routes that are proposed to run parallel to and/or traverse the subject property.

2 Under ***Section III, Parks, Recreation and Open Space - Impacts and Mitigations*** the DEIR states that "*a trail easement for the 2 to 3 mile on-site segment of the proposed San Martin Cross-Valley Trail would be dedicated in conjunction with the project. Segments of two additional trails along the project frontages on Coolidge Avenue and Watsonville Road would be dedicated and improved in conjunction with required roadway dedications and improvements.*" This section also states that the golf course would be open to the public to help alleviate the "*well documented shortage of golf courses in the County.*" With these mitigations in place, we believe that the DEIR has adequately addressed County Parks plans and policies with regard to the project area. Therefore, we have no further comments.

Sincerely,

Julie Bondurant
Park Planner

I. Response to County of Santa Clara Parks and Recreation Department

1. Comment noted. No response required.

2. Comment noted. No response required.

J

THOMAS KRUSE

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FAX Attention Juanell Waldo

Re: Lions Gate Reserve Golf Course DEIR File# 403-67-28-93

Dear Juanell

I am sending this fax in response to the DEIR. In addition to other concerns I have I feel compelled to write about some that I think were not dealt with fully or adequately. I will refer to their letter or number designation in the DEIR and/or appendix;

DEIR Summary B and Appendix B. Agriculture

1 While the developer offers as a mitigation measure the planting of vineyards he does not say how many acres or where they will be located. There would be an enormous difference say between 5 acres of vineyards and 100 acres of vineyards.

Correspondence produced by
Thomas Kruse Winery 4590 Hecker Pass Highway
Gilroy, California 95020 (408) 842-7016
Contents: 750 words on bon

Continued

J. Response to County of Santa Clara Planning Commissioner Thomas Kruse

1. This information is provided on page 18 of the DEIR, where it states that 110 acres of vineyard would be planted in two areas: a 10-acre area along the Coolidge Avenue frontage, and a 100-acre area at the western end of the project near Watsonville Road. This information is repeated on page 66 under "Mitigation 1." It should be noted that this mitigation measure has been revised to include vineyards and/or orchards.

The economic analysis done was modeled using hay, walnuts and cattle. The applicant is proposing vineyards as a mitigation measure. An analysis using vineyards as a model should be done. There are about 400 plantable acres on the entire site. Preliminarily I conclude that 5 tons to the acre @ $1200.00 ton less harvest and cultural costs of about $2000.00 per acre would net the operation $1,600,000 per year.

2

Further the consultant-Niles-conclusion where he says "Thus, there is no agricultural operation that could support any of these tax lots" is wrong.

3

Additionally where he attempts to depict Santa Clara County at a comparative disadvantage in footnote 2 of Appendix B does not demonstrate anything at all. His own orchard is taxed at

2. In response to this comment, Dr. Niles undertook an analysis of a hypothetical vineyard on the Hayes Valley site. This additional analysis has been added to Appendix B of the EIR. (See Section *VI. REVISIONS TO THE APPENDICES OF THE EIR.)* The analysis considered a hypothetical 400 acres of vineyards on the site. Based on current yields and prices, the analysis concluded that it would take at least 10 years before such an operation would reach a break-even position. This is due to the extremely high start-up costs of vineyards, which would total almost $6 million (not including land costs) before the first harvest in the third year of operation. While a vineyard would ultimately be profitable, the conclusion reached was that such an operation would not be financially justified given the opportunity cost of capital and the risk of the operation.

3. The agricultural feasibility report prepared by Dr. Niles was unclear with respect to a key element of the analysis. That is, although the family farm scenarios assumed no land costs and reduced property taxes under the Williamson Act, the cost of starting up a new farming operation was factored into the cost analysis (this latter information was not clearly explained). These start-up costs, which include land preparation, the cost of walnut trees, and the cost of planting, were factored in to make these scenarios somewhat realistic. In the San Joaquin Valley example, there are no such start-up costs to be paid off, and therefore that operation is economically viable while the project case would not be. By the same token, Dr. Niles study was not meant to imply that existing agricultural operations in Santa Clara County are not economically viable, particularly since most of these operations are probably not carrying debt for start-up costs.

$40± per acre and the 28 acre parcel he depicts if it was under the Williamson Act would be taxed at $41.43 per acre. His depictions of farming are clearly meant to arrive at his conclusion but a close reading and cursory analysis shows them to be fraught with error.

DEIR Summary C Parks, Rec etc.

4 While the dedication of 1265 acres of open space is commendable I think that unless the development rights over the golf course itself - 263 acres - are relinquished the impacts of the project as it is now and the potential for future growth impacts are not sufficiently mitigated. The is a model and a precedent for this type of arrangement.

4. With respect to growth-inducement within the golf course itself, there is a very low probability that the golf course would be redeveloped for another use. Considering the effort and expense of gaining project approval for the golf course, and the huge investment required to construct a premiere facility, it makes no sense to turn around and try to develop the site for something else.

Under the HS zoning, the golf course area could be developed for 13 cluster lots at most, which does not provide a financial incentive for converting the golf course. Any proposal for more intensive development would require a General Plan amendment to Rural Residential, but the General Plan specifically prohibits the creation of new Rural Residential areas or the expansion of existing Rural Residential areas.

The question of whether the development rights to the golf course area should be relinquished is a policy decision, and thus is outside the scope of the EIR.

It is my understanding that the City of San Jose and Brandenburg Development are doing just such a contract over their newly proposed golf course.

5 DEIR SUMMARY P and Appendix M Water Supply

Mr. Kirk has stated during his presentations that there was not a significant cost difference between pumping water from on site wells or purchasing it from West San Martin Water Co. I don't believe this to be the case. West San Martin sells water only at one rate and other small parcel owners in the area who are connected to West San Martin and have their own well use their own well wherever feasible because of significant cost differences. According to Mr. Upstead of the Water Co. the golf course

5. According to Robert Ukestad, the General Manager of the West San Martin Water Works, any water conveyed to the Lion's Gate project for irrigation purposes would be charged at a bulk rate which is approximately 35 to 42 percent of the rate for domestic supply. (The rate structure is discussed in the June 7 letter from WSMWW which has been added to the EIR. See Section *VI. REVISIONS TO THE APPENDICES OF THE EIR.)* It should be noted that the irrigation water would be piped directly from the water company's wells to the irrigation pond, and would not pass through the water storage tanks since no fire pressure would be required.

will not get a preferred or lower rate. Consequently the golf course - it may be concluded - will try to use their own water wherever possible. This makes it all the more important that it can be demonstrated that there is in fact an adequate supply of water for irrigation on the site. Mr. Hofer of Geoconsultants obtains his information from written data and he says "... these figures are preliminary in nature. In order to assure that the projected supplies are realistic, a detailed aquifer analysis will need to be performed at Livin's Gate Reserve. In addition, it may be necessary to perform further studies in the West San Martin and Twin Valley Areas." Consequently I think that is necessary that

6

6. As stated in the DEIR, on-site groundwater would provide the primary source of irrigation water but not the only source. On-site groundwater would not be pumped beyond its safe yield. Backup supplies would be provided by West San Martin Water Works, which has an enormous unused supply to draw from without adverse effects to the resource. (In fact, WSMMW could supply all of the irrigation water for the project, if necessary.) In order to determine exactly when to suspend on-site pumping, a down-gradient monitoring well to be located on the site would be monitored constantly during peak pumping periods to observe any drawdown in the water table, which would serve as the indicator of when to suspend on-site pumping and start drawing exclusively from the supplemental sources. In addition, existing off-site wells would also be monitored to ensure that impacts are not occurring to those wells. After the system has been in operation for a period of time, the project geohydrologist would obtain a more refined knowledge of the aquifer characteristics, and would be able to more closely predict available groundwater and plan for water supply augmentation based on the weather conditions and the previous winter's rainfall amount.

7 concrete steps be taken at this point in the application and EIR process and not just more theoretical suppositions being made. The golf course development should be required to site their wells now and drill them to test whether or not there is water. Further, pump tests need to be performed to substantiate the gallons available, the quality and other wells nearby need to be monitored to ascertain the impaction if any caused by pumping.

8 The DEIR makes reference to average rainfall of 21 inches with 3½ inches going to recharge the aquifer. In years with less than average rainfall what will be done? I think that the specific yield

7. There is no doubt in the part of Geoconsultants that more than sufficient water supplies are available to serve the project from on-site groundwater, in combination with supplemental supplies from West San Martin Water Works. (The Santa Clara Valley Water District, in a memo dated June 26, 1996, has indicated it concurrence that there is sufficient water available for the project. This memo has been added to the EIR and is included in Section *VI. REVISIONS TO THE APPENDICES OF THE EIR.)* Additional studies would be required prior to construction to define the characteristics of the aquifer, for purposes of determining the number of production wells needed, and their optimum locations, and in particular to establish setback distances for these new wells to ensure that they do not have an impact on off-site wells. There is no doubt on the part of Geoconsultants that there is sufficient area available on the site so that the required production well(s) can be placed in locations where they would not result in off-site impacts. The procedure for performing the detailed water balance study and well drilling is fully described in Section *II. OVERVIEW OF MAIN ISSUES DISCUSSED IN COMMENTS ON DEIR.*.

8. See next page for response.

8 data need to be proven and an alternate yield (safe yield) formula for water available needs to be figured out for "drought" years. Empirical data must be obtained before anything else should be allowed to proceed because of the totally water dependant nature of this project.

Thank you for your consideration

Very Truly Yours

Tom Kusel

8. Specific volumes of groundwater to be pumped each year would vary in accordance with rainfall amounts and recharges rates. The primary indicator for preventing overdraft conditions would be the monitoring wells discussed in Response #6 above. In addition, after the system has been in operation for a period of time, the project geohydrologist would obtain a more refined knowledge of the aquifer characteristics and would be able to more closely plan for water supply augmentations based on weather conditions and the previous winter's rainfall, or lack thereof during drought conditions.

It should also be noted that in the event of prolonged drought, water usage would be cut back in phases as prescribed in a drought contingency plan to be prepared for the project. (See page 189 of the DEIR for a detailed description of the plan.) In addition, approximately 8 percent of the irrigation water would be provided by reclaimed effluent from the package wastewater treatment plant. (As discussed at pages 196-7 of the DEIR, the treated effluent would be applied at rates no greater than evapotranspiration rates, so there would be no surface runoff or seepage below the root zone.)

THOMAS KRUSE

ATT'N JUANELL WALDO

RE: FILE # 4039-67-28-93 LIONS GATE GOLF COURSE

COMMENT ON DEIR APPENDIX N

9 This project as proposed calls for the formation of a CSD, CSA or special district. Additionally the applicant proposes that a wastewater treatment plant be constructed to handle the effluent from septic tanks. This process is precedent setting in Santa Clara County and has the potential of becoming a growth inducing impact on the site and perhaps elsewhere because of the ability to treat waste effluent ~~of~~ without allowing hookups such as might be the case in urban areas. I think that this make it all the more important to restrict future development on site by giving up the development rights over the golf course itself.

Very Truly Yours

Tom Kruse

Correspondence produced by
Thomas Kruse Winery 4590 Hecker Pass Highway
Gilroy, California 95020 (408) 842-7016

9. The issue of growth inducement on the golf course site itself is addressed in Response #4 above. With respect to expansion of the treatment plant at a later date to accommodate additional flows, it would be difficult to expand the treatment system once it is installed. All of the components of the package wastewater treatment facility would be sized to serve only the Lion's Gate project. That is, the treatment plant capacity would be limited to 30,000 gallons per day, which represents the peak daily flows of the project as proposed. According to Questa Engineering, it would be very difficult if not impossible to add to the system at a later date to accommodate additional development. The proposed treatment plant site is in a constrained location with very limited area available for expansion. Additionally, it would not be possible to expand the effluent disposal pond given its location on top of a knoll, and there are no suitable locations for additional ponds nearby. Also, new pipeline would have to be laid and pump stations added. Moreover, it is unclear what the incentive would be to the homeowners association and the county club for tolerating the inconvenience and nuisance of a system expansion that would not benefit them.

K

County of Santa Clara

Roads and Airports Department

1505 Schallenberger Road
San Jose, California 95131

MEMORANDUM

DATE: April 26, 1996

TO: Jaunell Waldo
Associate Planner

FROM: Ed Evangelista
Land Development and Permits

SUBJECT: Draft EIR

FILE NO.: 4039-67-28-93 (Lion's Gate) Highland Avenue

We have reviewed your March 19, 1996, transmittal along with the attachments for the subject project, and our comments are as follows:

1 (1) The site is located in the area of severe flooding problems. Therefore, we will require that prior to the project's approval, a drainage plan for any impact to County maintained roadway be submitted for our review and approval.

The drainage plan should include drainage calculations prepared by a registered civil engineer and demonstrate that the surface runoff from the site is carried to an acceptable out fall of adequate capacity.

2 (2) We have an existing Official Plan Lines (OPL) along Watsonville Road and Coolidge Avenue. No permanent improvements should be located within the OPL.

At the time of the site development, we will require the developer to dedicate and improve a minimum 30 ft. half street along the site's Watsonville Road, Turlock Avenue, and Highland Avenue frontage. Dedicate and improve the site's frontage along Coolidge Avenue to the minimum 55 ft. half street to the OPL.

3 (3) A County encroachment permit should be obtained prior to the beginning of any work within the County's jurisdiction.

cc: M. Akbarzadeh
A. Chan
File

epe534

K. Response to County of Santa Clara Roads and Airports Department

1. Comment noted. The EIR has been amended to include the revised information. (See Section *V. TEXT AMENDMENTS.)*

2. Comment noted. The referenced Official Plan Lines are discussed on page 161 of the DEIR.

3. Comment noted. This is a standard requirement to be contained in the plans and specifications for the project.

L

CITY OF MORGAN HILL

17555 PEAK AVENUE MORGAN HILL CALIFORNIA 95037

May 3, 1996

Ms. Jaunell Waldo
Santa Clara County Office of Advance Planning
County Government Center, East Wing
70 W. Heading St.
San Jose, CA 95110

RE: Draft Environmental Impact Report for the Lion's Gate Reserve Golf Course.

Dear Ms. Waldo,

Thank you for forwarding a copy of the Lion's Gate Reserve DEIR to the City of Morgan Hill for our review and comment. After reviewing the documents, the City's has some comments/questions that we feel should be addressed in the final EIR document.

1 First, due to the mutual aid agreement with the City of Morgan Hill, the City believes it is important to retain the proposed mitigations under the Fire Protection section requiring that all structures be sprinklered and all access roadways be of sufficient width to accommodate emergency service vehicles. Additionally, the City believes it is equally important that any tanks necessary to assure adequate water pressure to produce adequate fire flow are in place as part of

2 the construction of the project. It was noticed that on Page 187, Mitigation 1a., Paragraph 2, that the last sentence indicates that when the new tank is completed by the water company, that there would be sufficient capacity to meet the fire flow requirements for the Lion's Gate project. The first sentence in this paragraph indicates that the water company plans to build this tank in the "future." Will this tank be completed before or after the construction of the project? If it is constructed after, will adequate water pressure be available to produce adequate fire flows for the sprinkler systems and on-site hydrants. A similar statement is made on Page 202, in the section titled "Water Supply."

3 Second, there did not appear to be any discussion in the DEIR that addressed the potential failure of the wastewater disposal system and subsequent alternatives. If for some reason the proposed system becomes inoperable or infeasible what other alternatives would be used to service the waste water needs of the project after its built? The DEIR should address this topic as it may impact the City of Morgan Hill.

L. Response to City of Morgan Hill

1. Comment noted. No response required.

2. Mr. Bob Ukestad, the General Manager of the West San Martin Water Works, has indicated that the water storage tank will be complete and operational by mid-1998, when the golf course component of the Lion's Gate project is also scheduled for completion.

3. The planned wastewater system is known to be technically feasible since it is based on proven and well understood technologies, and does not represent a new or experimental process. The treatment system is known to be economically feasible because similar plants are being successfully supported by similar sized service areas elsewhere in the region. In the unlikely event that the treatment plant were to become temporarily inoperable, there are redundancies built into the system to prevent a public health emergency. The individual residences would each have septic tanks which could be pumped out as needed. The system would also include emergency backup generators in the event of power outages, and short-term storage capacity is included in the design of the treatment plant and the lift stations, as well as the septic tanks themselves. In the extremely unlikely event that the plant were to become totally unusable, the residential treatment requirements could be met by installing leachfields at each homesite. (Each lot has been tested for leachfield suitability and meets County requirements.) In such an event, the golf course facilities would have to be shut down until an alternative advanced secondary treatment process, such as recirculating sand filter and community leachfields, could be brought on-line.

4 Finally, the DEIR did not appear to address the impact on the water supply for south county. The proposed project appears to be water intensive. The report appears to discuss the impact to the immediate water suppliers but doesn't addrss the potential impact on the neighboring cities of Morgan Hill and Gilroy. The report should address how this project may impact the City's ability to meet its immediate and future water needs?

If you have any questions regarding my review or comments please call me at (408) 779-7248. Thank you for the opportunity to comment on this project.

Sincerely,

Terry Linder
Associate Planner

cc: David Jinkens, City Manager

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4. Geoconsultants has determined that the combination of on-site pumping at the Lion's Gate site, and the pumping for additional water supply from the West San Martin Water Works would not result in adverse impacts on the respective aquifers being pumped. Since the Cities of Morgan Hill and Gilroy are located some distance from these pumping sites, no impacts would occur to the water supplies for those two cities.

M

May 2, 1996

Juanell Waldo
Santa Clara County Office of Advance Planning
County Government Center, East Wing
70 W. Hedding Street
San Jose, CA 95110

RE: Lion's Gate Reserve (Hayes Valley) DEIR

Dear Juanell,

Thank you for this opportunity to express our concerns regarding the DEIR. Our concerns relate to 1) the overall scale and intensity of the development, 2) possible loopholes regarding the open space dedication, 3) impacts on water supply, 4) the package sewage treatment plant, 5) water quality/ riparian impacts, 6) impacts on biological resources, and 7) inappropriate rationale for loss of agricultural lands.

1) Overall Scale and Intensity Development

1 The Committee For Green Foothills has grave concerns over the unprecedented scale and intensity of this project in a rural unincorporated area miles from any existing urban service area. This project combines recreation, commercial and residential uses and consists of over 850,000 sq. ft. of buildings not including the 41 residences. We find the intensity and scale of this project to be inconsistent with the General Plan on several counts:

2 First, we question whether this project- as proposed- can really be considered non-urban and low density in nature as required by General Plan policy R-GD 2 (which is not mentioned in the EIR) for rural unincorporated areas. Furthermore, we believe that the commercial aspect of this project is not in keeping with the

3 General Plan's strong commitment to limiting urban uses to existing urban service areas.

4 Second, contrary to the statement on p. 212, this project *does* represent a change in the character of the area in that it introduces commercial development into a very rural area. According to the General Plan, this area will *not* be shifting to a "more urban character," as it states in the EIR. Please correct this discrepency.

M. Response to Committee for Green Foothills

1. The total floor area contained in the golf course and ancillary uses, and the equestrian center is approximately 114,000 square feet (not including the residences), not 850,000 square feet as stated in the comment.

2. The project cannot be characterized as urban in scale or intensity by any measure. The Floor Area Ratio (ratio of total floor area to total site area) or FAR of the golf course facilities is less than 1 percent of the golf course area compared with typical suburban FARs of 40 to 60 percent for industrial park or commercial retail developments. The FAR of the residential component is approximately 3 percent, compared with 30 to 40 percent for a typical suburban tract subdivision. The impervious surface coverage by the golf course and residential components, including all roads, parking areas, driveways and cart paths, is 6 percent over the 410-acre development area, and 1.5 percent over the entire site area. Compared with 40 to 50 percent for a suburban subdivision and 80 to 95 percent for industrial park or commercial retail development, these coverages reflect a very low intensity of land use. Applying traffic generation is taken as a measure of land use intensity, the total project would generate approximately 1.5 trips per minute during the p.m. peak hour, which is an extremely low rate compared to typical suburban development. These figures demonstrate that the proposed project is indeed non-urban and low-intensity in nature.

3. As discussed in Section II of the DEIR, the proposed project conforms with the "Hillsides" designation of the County General Plan, and the provisions of the Hillside (HS) Zoning District. Section 14-4.2(b) of the HS zoning regulations specifically permit all of the uses proposed including clubhouse, overnight accommodations, swimming pools, tennis courts, and bar and restaurant. Also permitted under HS zoning regulations are corrals and caretakers residences. Thus the proposed project is not considered an inappropriate use for the site according to the applicable County General Plan and zoning requirements.

4. It is important to note that the cumulative impact analysis referenced in the comment took into consideration the approved and pending projects in San Martin and Morgan Hill, which has its southern City limits approximately one mile north of the project site. This is the "area" within which the project could contribute incrementally to cumulative impacts. This area currently includes urban (or suburban) and rural uses, and the overall trend within this area, which is dominated by trends in Morgan Hill, is toward urbanization. However, within the immediate area of the project, it is more accurate to characterize the trend as being a gradual shift from rural agricultural undeveloped land use to developed rural residential land use. This trend has been institutionalized in the San Martin Planning Area policies of the General Plan, which designates most of the area in the project vicinity for Rural Residential development. The DEIR has been amended to add this more specific discussion for the immediate project area. (See Section *V. TEXT AMENDMENTS.)*

5 Third, Committee for Green Foothills finds the overnight accommodations particularly difficult to justify. As recognized in the EIR, allowing overnight accommodations in conjunction with a golf course proposal in the hillsides would be precedent setting, thereby putting the County in a difficult position when approached with future similar proposals. This should be included in the Cumulative Impacts section as it would impact all similar proposals in

6 unincorporated hillside land. Furthermore, General Plan policy R-LU 26 requires that for uses which involve overnight accommodations, the "proposed densities must be consistent with the scale of the allowed recreational or commercial use." However, because studies to determine allowable densities of overnight accommodations have not been completed, this project, if approved, would

7 "stand as the only benchmark of what the County considers an 'appropriate' development density for such uses." What is the justification for the number of units proposed? Is the county willing to use this project's proposed density as a standard for future proposals without conducting any preliminary study?

8 Another point to consider is that allowing overnight accommodations will risk turning the golf course into a resort for out of town guests, thereby competing with the purported high local demand for tee-time and decreasing its public benefit to the local community. Committee for Green Foothills feels that if indeed there is a documented need for overnight accommodations, they should be located within the urban service area of Morgan Hill.

9 And fourth, it is almost impossible to visualize the magnitude and extent of this project. The photo simulation on pg. 147 is a pathetic attempt to provide any visual sense of this project. It should be replaced and supplemented with several photo simulations from various viewpoints that provide some realistic visual analysis of this project. In addition, before a decision can be made, a model of this project should be made available to provide decision makers and the public with good visual sense of how this project would impact Hayes Valley and adjacent lands.

2) Open Space Dedication

Although we applaud the dedication of 1,265 acres of open space, we have several concerns regarding the details of this dedication.

10 First, the EIR states that the 1265 acres of open space will be placed in the ownership of the Homeowners Association formed by the owners of the 41 proposed residences. Is the applicant proposing that the Homeowners Association hold the easement? If so, this essentially means that the Home Owners Association can legally undedicate the land as open space at any given meeting for any given reason. To avoid this loophole and to clarify the intent of

11 the applicant, we request that the easement be held by the Santa Clara County Open Space Authority. In addition, the land-use limitations on the open space easement should be clearly defined in the EIR to ensure proper enforcement.

5. As noted under Response #3 above, Section 14-4.2(b) of the County's Hillside zoning regulations specifically permit overnight accommodations within the HS zone. Thus the decision to approve these units would not be precedent setting in the sense that it would lead to proposals for overnight accommodations in areas where they are not currently permitted by County Zoning.

6. On April 18, 1995, the Board of Supervisors approved the recommendation of the Planning Commission that pending golf course use permit applications (specifically the Lion's Gate and Los Gatos County Club projects) not be required to wait for completion of study of "Hillsides" zoning ordinance, as recommended in General Plan implementation recommendation R-LU(i) 9. This implementation was to specify maximum permissible sizes allowed in conjunction with golf courses, including clubhouses, overnight accommodations, and restaurants. The Planning Commission findings in support of the recommendation stated that the two pending golf course proposals did not involve facilities that appear to be out of scale relative to the size of the golf courses. It is important to note that, at that time, the proposed Lion's Gate project included 60 units of overnight accommodation, which has since been scaled back to 45 units.

   The proposed overnight accommodations would be constructed as a series of adobe cottages following the natural contours. Having a low profile with much variation in building planes and rooflines, these units would not appear as a massive hotel but would blend in with the surroundings. The total floor area of the overnight complex would be approximately the same as the clubhouse itself, and thus would be consistent with the scale and character of the clubhouse, which also would be built in the adobe style.

   In addition, as discussed in Response #8 below, overnight guests could make up approximately 50 percent of the total golf rounds, with the remainder comprising daily fee users. Thus the overnight accommodations would not result in turning the golf course into a resort for out-of-town visitors. As such, the scale of the overnight accommodations would be consistent with the scale of the golf course development.

7. The 45-unit figure is the lowest number considered to be economically feasible by Benchmark Hospitality, the firm that would operate the overnight accommodations. Benchmark operates numerous such facilities, including the Squaw Creek Resort at Lake Tahoe and Chaminade in Santa Cruz County. Based on their experience, Benchmark believes a higher number of units could be supported at the site. In fact, the project originally included 60 overnight units, but this was scaled back to 45 units after the 9-hole academy course was eliminated from the plan.

8. With the 45 units of accommodations proposed, overnight guests would comprise an average of approximately 50 percent of the golf rounds. Assuming each room is occupied by two golfers, and assuming 100-percent occupancy, as many as 90 golfers per day could be accommodated here. It is estimated that 50,000 rounds of golf will be played here per year, which yields an average of 137 per day. Thus the overnight guests could comprise a maximum of 66 percent of the average daily golf rounds. The actual percentage is likely to be 50 percent or lower, considering that occupancy rates would likely average 80 percent, and the unlikelihood that each room would house two golfers. In summer, when the number of golf rounds per day could exceed 200, the percentage comprising overnight guests would be lower still.

9. The comment refers to Figure 16 of the DEIR, which is actually an artist's rendering and not a photo-simulation as indicated. The EIR has been revised to reflect this corrected information. (See Section *V. TEXT AMENDMENTS.)* Since the only vantage point from which the project

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would be visible to the public from off-site locations is from the east, the rendering was done from that vantage point. (As noted in the DEIR, there is one private residence with views over the site from the ridge to the north.) The rendering shows that with the landscaped frontage berms in place, very little of the project would be visible from off-site locations to the east.

The homes to the north, near Highland Avenue would be as close as 200 feet from the road, while the majority of the homes would be at least 1,400 feet from the roadway behind the lake. All of the homes would be screened by the landscaped berm along Turlock Avenue, although some homes would be partially visible through occasional breaks in the berm. To the south, the equestrian center would be located at least 300 feet from the roadway, and would be partially visible through breaks in the berm and through the opening for the access road to the equestrian center. Along the frontage of Coolidge Avenue to the north, the homes would be set back at least 300 feet from the roadway and would be screened by landscaped berms and a vineyard or orchard to be planted in the setback area. Some of the homes may be partially visible through breaks in the berm. During the first few years after project completion, the homes and equestrian center along the eastern project frontage would be more visible until the landscaping planted on and along the berms matures to provide the intended visual screening. The rendering shown in Figure 16 (Revised) shows the proposed frontage landscaping in a mature state.

Since no other aspects of the project would be visible from public roadways or inhabited areas, no further illustrations of visual impact are necessary. However, the DEIR does contain site plans for the golf course and the residential areas, as well as renderings of the clubhouse complex, to provide visual illustrations of these aspects of the project. In addition, a model of the project is currently being constructed.

10. The homeowners association would hold title to the open space areas of the hillside cluster development. As stipulated by the County General Plan, a conservation easement over the open space area would be dedicated to the County.

11. With respect to permitted land uses within the open space area, General Plan Policy R-LU 20 states:

> d. land uses allowed within the area dedicated as permanent open space shall be limited to agricultural or other limited resource-related uses, and to non-commercial recreational facilities of an ancillary nature to the cluster residential development and for use by residents only.

In addition, the County's Cluster Permit Ordinance states that the open space shall be "adequate for the recreational and leisure use of the population that will occupy the cluster development..." and that "insofar as possible...natural features of the land are preserved." The applicant proposes to preserve most of the open space area in its natural state, and to utilize portions of the area for vineyards, an equestrian center and horse trails, all of which conform with the applicable policy and ordinance requirements.

12 Second, as noted in the EIR there is no easement or dedication of development rights over the golf course itself, which means that the course could be redeveloped at a future date. This growth-inducing possibility is not discussed in the EIR. To mitigate this impact, we request that an open space easement be
13 placed over the golf course itself, as was done in the Brandenburg Golf Course planned next to the Calero Reservoir in San Jose.

14 Third, the 1265 acres of open space required by the General Plan includes berms, the equestrian center and residential open space areas as part of the open space acreage. These areas are not, as required by General Plan policy R-LU 20, "configured as large contiguous and usable areas." These areas should be omitted from the open space total acreage and made up elsewhere on the site.

15 Finally, p. 71 inaccurately states that the Hayes Valley site was identified as low priority for open space preservation. In fact, the site was listed as number 26 out of 61 sites studied which can not be considered "low" priority.

5) Water Supply

16 The EIR does not clearly and adequately address the fact that Hayes Valley, the site of this project, is its own complete watershed ultimately dependent on direct rainfall for recharge. Because it is isolated, it does not benefit from recharge efforts of the Santa Clara Valley Water District. As this project depends primarily on the withdrawal of on-site ground water, the potential risk of overdraft and the resulting impacts on surface and ground water supply and quality are high.

17 Therefore, it is critical that the annual safe yield estimate be precisely accurate for this specific site. It is my understanding that the average annual safe yield of 280,000 gpd was based on studies done in 1971 and therefore does not account for our last two droughts. The EIR itself states in the appendices that "extended
18 periods of heavy rainfall or drought may significantly alter the annualized average." We request a current study be conducted before finalization of the EIR to verify the average annual safe yield of 280,000 gpd, which seems impossibly high. In addition, the safe yield should be adjusted annually to account for
19 varying annual rainfall and resulting recharge levels in order to minimize risk of overdraft.

20 The number and location of additional on-site wells should be determined before finalization of the EIR so that their impacts can be thoroughly analyzed and addressed. This will require that pump-tests be "conducted to gain an understanding of aquifer characteristics, especially the transmissivity of the
21 ground water" before EIR certification and project approval. What is the procedure for drilling additional on-site wells in the future?

12. The issue of whether an easement over the golf course is appropriate is a policy question and is not a CEQA issue, and therefore is outside the scope of the EIR.

13. Within respect to the growth-inducement within the golf course itself, there is a very low probability that the golf course would be redeveloped for another use. Considering the effort and expense of gaining project approval for the golf course, and the huge investment required to construct a premiere facility, it makes no sense to turn around and try to develop the site for something else. Under this HS zoning, the golf course area could be developed for 13 cluster lots at most, which does not provide a financial incentive for converting the golf course. Any proposal for more intensive development would require a General Plan amendment to Rural Residential, but the General Plan specifically prohibits the creation of new Rural Residential areas or the expansion of existing Rural Residential areas.

14. The hillside cluster subdivision and the main access road comprise 109.3 acres of the site. The amount of open space required to fulfill the 90 percent requirement is 983.7 acres. The proposed open space area comprises 1,265.7 acres, which represents an excess of 282 acres above the required amount of open space. It is clear from reviewing the project site plan that there is far more than the required 983.7 acres "configured as large, contiguous and usable areas" as stipulated in General Plan Policy R-LU 20. The project includes within the permanent open space areas approximately 60 acres to be used for landscaped berms, buffer areas, the equestrian center and the lake. These areas are included because they are also intended to be owned and managed by the homeowners association. It should also be noted that the above policy language refers to "areas," indicating that the open space area need not comprise a single contiguous area.

15. The Open Space Preservation report covers a total of 61 study areas, but not all of these study areas contain open space areas targeted for preservation, of which there are only 42. A ranking of 26 out of 42 places the Hayes Valley site is in the mid-range of priority for open space acquisition. The EIR has been revised to incorporate this new language. (See Section *V. TEXT AMENDMENTS.)*

16. As stated in the DEIR, the primary source of irrigation water would be from on-site groundwater, but this source would not be pumped beyond its safe yield. Backup supplies would be provided by Twin Valley, Inc., and West San Martin Water Works, the latter of which has an enormous unused supply to draw from without adverse affects to the resource.

17. The estimate of 280,000 gpd is a very conservative preliminary estimate, and the actual safe yield is probably higher. The precise safe yield would be determined prior to project construction. In addition, down-gradient groundwater levels would be monitored regularly during project operation to ensure pumping does not lower the water table for downstream users.

18. The rainfall information cited from Rantz (1971) consisted of an isohyetal (rainfall contour) map of the greater Bay Area. The precipitation values were based on specific gauges throughout the area, and represent the average rainfall for the 50-year period between 1906 and 1956. Although this study has not been updated since then, the gauges have continued to monitor rainfall. There is no precipitation gauge currently installed at the site; however, a gauge in Gilroy has determined average annual rainfall to be 20 inches for the period of 1957 through 1994. Rantz's isohyetal map showed rainfall at Gilroy to also be 20 inches for the period form 1906 to 1956. Therefore, due to the proximity of Gilroy to the site (roughly 4 miles), it can be assumed that the annual rainfall for Hayes Valley has also continued to be the same since 1956. Therefore, the

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average annual safe yield of 280,000 gallons per day calculated in the preliminary groundwater study is based on reliable rainfall data.

19. As part of project operations, a down-gradient monitoring well to be located on the site would be monitored constantly during peak pumping periods to observe any drawdown in the water table. This would serve as the indicator of when to suspend on-site pumping and start drawing exclusively from the supplemental source. In addition, existing off-site wells would also be monitored to ensure that impacts are not occurring to those wells. After the system has been in operation for a period of time, the project geohydrologist would obtain a more refined knowledge of the aquifer characteristics, and would be able to more closely predict available groundwater, and plan for water supply augmentation based on the weather conditions and the previous winter's rainfall amount.

20. There is no doubt on the part of Geoconsultants that more than sufficient water supplies are available to serve the project from on-site groundwater, in combination with supplemental supplies from West San Martin Water Works. (The Santa Clara Valley Water District, in a memo dated June 26, 1996, has indicated it concurrence that there is sufficient water available for the project. This memo has been added to the EIR and is included in Section *VI. REVISIONS TO THE APPENDICES OF THE EIR.)* Additional studies would be required prior to construction to define the characteristics of the aquifer, to determine the location(s) of production well(s), and in particular to establish setback distances for these new wells to ensure that they do not have an impact on off-site wells. There is no doubt on the part of Geoconsultants that there is sufficient area available on the site so that the required production well(s) can be placed in locations where they would not result in off-site impact.

21. The procedure for performing the detailed water balance study and well drilling is fully described in Section *II. OVERVIEW OF MAIN ISSUES DISCUSSED IN COMMENTS ON DEIR.*

22 A portion of the water required for this project would be supplied by West San Martin Water Works. Is this source dependent on the construction of the new 300,000 gallon water tank? Has this project been approved? When will it be completed? is project dependent on new 300,000 tank water project. Will this
23 project go through, If so when will it be completed?

24 The project calls for at least 2 proposed detention ponds, the rerouting, piping and filling of tributaries, and over 850,000 sq. ft. of impervious surfaces not including the 41 residences. How will this affect creek flow, ground water
25 recharge and, ultimately, the average annual safe yield?

3) Package Sewage Treatment Plant

26 The Committee for Green Foothills has grave doubts about the wisdom and efficacy in approving an alternative package sewage treatment plant for this project as it would set a dangerous precedent for other large rural projects and result in severe growth inducing impacts. Ultimately, these systems- unlike septic or municipal sewage systems- can accommodate unlimited growth in remote areas outside urban service areas. To date, the Regional Water Quality
27 Control Board has not approved an on-site treatment plant for a project of this scale or intensity in Santa Clara County. In addition, studies required by CEQA to evaluate the cumulative impact of residential use of alternative systems have
28 yet to be completed.

29 Nowhere in this EIR is the precedent setting nature and growth inducing aspects of this system addressed. The General Plan attempts to limit the growth inducing impacts of these systems on *residential development* by requiring that they be built only if and where traditional septic systems could serve the project. However there are no growth inducing limitations on these systems for *commercial* development(i.e.. the golf course, clubhouse, pool and tennis courts, overnight accommodations, conference centers, equestrian center, etc.). How
30 will the growth inducing and precedent setting aspect of this system on commercial development be mitigated? Could the non-residential component of
31 this project be accommodated by septic? If not, what is the package sewage treatment plant alternative? What are the restrictions on increasing the size of
32 the system once the project is approved (i.e.. could it be expanded to serve existing and future residential units in San Martin)?

33 The precedent setting nature of this system is exacerbated by the creation of a Community Services District (CSD) for the purpose of owning and operating the system. Forming a CSD is essentially like setting up a new town- a new urban service area. A CSD is a quasi-governmental agency that can provide numerous functions besides sewer such as water, fire, recreation etc. for a designated area. Would this CSD provide other services besides sewer? What would limit the
34 CSD from providing other services and what would prevent it from expanding its boundaries? As noted in the EIR, the CSD and its boundary must be

22. West San Martin Water Works would supply all of the domestic water for the project, and would serve as a backup source for irrigation water. Domestic water supplies would originate from off-site tanks to provide the required fire flows and pressure. Irrigation supplies, which have no minimum flow or pressure requirements, would be conveyed directly to the on-site irrigation storage pond.

23. Bob Ukestad, the General Manager of West San Martin Water Works, indicate in a letter dated June 7, 1996 that the water tank will be complete and operational by mid-1998, which is also when the Lion's Gate golf course is scheduled for completion. The letter has been added to Appendix M of the EIR. (See Section *VI. REVISIONS TO THE APPENDICES OF THE EIR.)*

24. As mentioned, the project includes a total floor area of approximately 114,000 square feet (including the golf course and ancillary uses, and the equestrian center, but not the residences), not 850,000 square feet as cited in the comment.

25. The total impervious surface coverage of the site would represent 1.5 percent of the total site area. These changes, together with the piping and rerouting of some tributary drainages, would have negligible effects upon groundwater recharge and safe yield. Except for the treated effluent storage pond and the equestrian facility retention pond, none of the on-site ponds, lakes and basins would be lined, so they would help facilitate recharge rather than impede it.

26. Comments noted. It was recommended by the County Department of Environmental Health and the Regional Water Quality Control Board that the project utilize a package treatment plant instead of conventional leachfield systems. In addition, the Llagas Groundwater Basin Nitrate Study by the Santa Clara Valley Water District recommends the use of package treatment plants for residential developments in order to limit nitrate loadings from individual septic systems.

27. On-site package treatment plants are routinely approved by the Central Coast Regional Water Quality Control Board. To date, the Regional Board has approved 10 to 15 such plants in the neighboring counties of San Benito, Santa Cruz and Monterey. These treatment plants are being monitored by the Regional Board, which has found that they are operating satisfactorily, and meeting all the discharge requirements, as well as producing a high quality of effluent.

28. The County is precluded from approving alternative wastewater disposal systems for individual dwellings. There is no such prohibition on package plants, which are administered by the Regional Water Quality Control Board and the County Department of Environmental Health, as long as conventional septic systems would be feasible under County requirements and standards.

29. As noted, golf courses and ancillary uses are permitted in the HS zoning district. The decisions whether to approve future golf course projects with package treatment plants elsewhere in the County rests with the County decision-makers, and would be based on thorough environmental review for those projects. It is impossible to guess whether, where and when such future projects might be proposed, and any attempt to analyse the growth-inducing impacts of such unknown projects would be purely speculative and thus would not be required under CEQA.

30. Any future projects would be subject to the County's environmental review process, through which project-specific mitigation measures would be identified for implementation in conjunction with project construction.

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31. Septic systems with leachfields were not specifically investigated for the golf course component of the Lion's Gate project. An enhanced treatment process was determined to be more appropriate for this project, particularly since the County's nitrate study of the Llagas Groundwater Basin specifically recommends the use of package treatment plants instead of conventional leachfield systems. An alternative method of enhanced treatment might be a recirculating sand filtration system, where in the effluent is filtered through a sand mound before being disposed of in a community leachfield or by spray irrigation. These systems are in use at commercial land uses elsewhere in the County.

32. As a practical matter it would be difficult to expand the treatment system once it is installed. All of the components of the package wastewater treatment facility would be sized to serve only the Lion's Gate project. That is, the treatment capacity would be limited to 30,000 gallons per day, which represents the peak daily flows from the project as proposed. It would be very difficult, if not impossible, to add to the system at a later date to accommodate additional development. The proposed treatment plant site is in a constrained location with very limited area available for expansion. Additionally, it is not possible to expand the effluent disposal pond given its location on top of a knoll and there are no suitable locations for additional ponds nearby. Also, new pipeline would have to be laid and pump stations added. Moreover, it is unclear what the incentive would be to the homeowners association and the country club for tolerating the inconvenience and nuisance of a system expansion that would not benefit them.

33. The CSD is permitted by law to provide additional services besides wastewater collection, treatment and disposal. The CSD for the Lion's Gate project may also provide for maintenance of streets, storm drains, lighting and landscaping.

34. Any boundary adjustment for the CSD would require LAFCO approval and discretionary approval by the County for any new project to be included in the CSD. At the time that the boundaries of the CSD are set, LAFCO would also establish a Sphere of Influence for the CSD. Since the objective would be to prevent future expansion of the CSD, the Sphere of Influence boundaries would be made coterminous with the CSD boundary. Any request from property owners outside the CSD for a boundary expansion or annexation to the CSD would require a showing of compliance with the policies governing such annexations, as well as the policies governing expansions of Spheres of Influence. The board of directors of the CSD would almost certainly oppose any such annexation request, which would have significant influence on LAFCO's decision regarding any such requests.

35 approved by LAFCO. What are LAFCO's thoughts on the creation of this new service district? According to state policy, one of LAFCO's primary purposes is to *discourage* the creation of new districts. What is the alternative to creating a CSD? The precedent and growth inducing impacts of this CSD should be addressed in the EIR.

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In addition, it should be specifically stated in the EIR that this agency resumes fiscal responsibility in the case of failure which is common and extremely costly, often necessitating public dollars (which the county does not have) to absorb the costs or the environmental cleanup costs stemming from the failure.

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4) Riparian Impacts

While we commend the riparian enhancement and restoration programs, Committee for Green Foothills believes that the EIR underestimates the projects' impacts on riparian corridors. On p. 27, it states that "the project largely incorporates the existing natural drainage system into the design of the golf course and residential areas." However it goes on to say that "there are several instances where short reaches of tributary drainages would be rerouted or piped to accommodate fairway layout and small existing meanders would be removed." Where exactly would this occur? How is this justified and could this be avoided? The EIR later states that the project will result in a loss of 1.7 acres of riparian vegetation, of which .4 acres would become non-riparian due to diversion or filling of channels. How will this affect species dependent on these wildlife corridors? In addition, the project calls for 13 stream crossings. After touring several golf courses with the Golf Course Environmental Design Guidelines Committee this seems significant and is not consistent with the interim Guidelines. These impacts on riparian corridors are of great concern and should be further addressed.

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42 5) Impacts on Biological Resources

There is no EIR discussion of how this project will impact wildlife corridors and the wildlife dependent on those corridors. The EIR also lacks a wildlife management plan for controlling wildlife on the golf course (i.e.. how will deer foraging and ground squirrel problems be managed?). Both these issues need to be addressed in the FIER.

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44 6) Inappropriate Rationale for Loss of Agricultural Lands

While we accept the planting of 110 acres of vineyards as a mitigation for the loss of 110 acres of prime farmland, we do not accept the rationale of "lack of economic viability" as decreasing the impact of this loss. How does economic viability reduce the impact of the loss of 110 acres of fertile agricultural land?. This reasoning sets a dangerous precedent for rationalizing the loss of all prime

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35. LAFCO's decision to approve the formation of a CSD would require a showing of compliance with the LAFCO policies governing such formations. In general, the proposed CSD must satisfy the criteria that the formation of the CSD is the most feasible administrative solution available. The DEIR has been revised to include an analysis of the proposed CSD in terms of the LAFCO guidelines and policies governing the formation of CSDs (see Section *V. TEXT AMENDMENTS).*

36. It should be noted that the creation of the proposed CSD was originally suggested by the Department of Environmental Health and the Regional Water Quality Control Board as an effective mechanism for ensuring the proper long-term operation and maintenance of the treatment facility. The treatment plant could be operated by a private entity if only the golf course were to be served. But where multiple ownerships are involved, as with the Lion's Gate project, the facility must be managed by a public entity. Other potential solutions include annexation to an existing incorporated city, or the formation of a County Service Area or CSA; however, the County is not willing or able to administer such entities.

37. The creation of a CSD, in and of itself, is not growth-inducing. A CSD is only a mechanism for effective implementation of long-term operation and maintenance for facilities that have already been approved by the County decision-makers. As noted above, the boundaries of CSDs are strictly circumscribed, and any future expansion to accommodate new development would require approval of the County and LAFCO.

38. It is not accurate to state that failures of community-scale package treatment plants are common. On the contrary, package treatment plants are being looked to as alternatives for avoiding failures of individual septic systems, which is all too common. Package treatment plants require discharge permits from the Regional Board and approval by County Health, and must be operated by a licensed professional. It is important to note that the treatment plant proposed does not represent a new or experimental technology, but is made up of components and processes that are proven and well understood. There is always the possibility of a breakdown of individual system components, such as a pipe break or a pump failure, which can be readily dealt with, but the potential for a complete catastrophic system breakdown is extremely remote. The treatment plant would be operated by trained professionals, and there would be a maintenance and operation fund to cover maintenance and repairs.

39. With respect to the meanders, there are actually no plans to remove the existing oxbow and meander from the main creek channel. The DEIR erroneously stated that the meanders would be removed, a conclusion which was based on a review of the overall golf course plan. However, the more detailed grading and drainage plans do not show grading or vegetation removal in the vicinity of these meanders. The golf course designer, Robert Trent Jones II, confirmed that these meanders would not be removed, and that they were simply omitted from the more general overall site plan. The EIR has been revised to incorporate this corrected information. (See Section *V. TEXT AMENDMENTS.*)

    The tributary drainages to be partially realigned or piped are located on Holes 2, 3, 4, 5, 17 and 18. These intermittent tributary drainages appear as grassy swales, and the minor piping or realignment of some of these drainages would result in the loss of 0.33 acres of riparian woodland. These minor alterations are necessary for the feasibility of the golf course design.

40. As stated in the DEIR at page 125, without mitigation the loss of riparian vegetation would reduce the value of the riparian habitat. The implementation of the riparian restoration and enhancement plan would provide full mitigation for the loss of riparian habitat. In addition, the

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removal of cattle from the site would eliminate a major source of riparian habitat degradation from the site.

41. Subsequent to the release of the DEIR, the applicant revised the golf course plan to eliminate 5 golf cart bridges, leaving 8 cart bridges and 2 roadway crossings. (See revised Figures 9b and 10a in Section *V. TEXT AMENDMENTS.*) These proposed crossings were sited to avoid existing riparian woodland. Bridges would all span the creek channel to allow for wildlife movement underneath. Since the crossings would all occur in areas where the existing habitat is degraded, the impacts would be minimized.

42. According to H. T. Harvey and Associates, the loss of riparian vegetation would have a minimal effect on the wildlife corridor. The existing creekside areas are very degraded and have little riparian vegetation, and are mainly occupied by species typical of the adjacent non-native grassland areas.

43. Ground squirrels are currently not very prevalent on the site. If they become a problem for the golf course, they could be controlled by trapping or species-specific eradication in a manner that does not have secondary impacts to other species. Deer are not a problem for golf course fairways or greens, but they could browse on landscaping. If that becomes a problem, protective fencing would be installed for landscaping.

44. The analysis of agricultural economics was performed by Dr. James A. Niles, formerly chairman of the Agribusiness Institute at the University of Santa Clara. Dr. Niles' analysis shows the marginal viability of new agricultural operations in South Santa Clara County even under the most favorable conditions (e.g., no land carrying costs and reduced property taxes under the Williamson Act), neither of which apply to the Lion's Gate property. However, the analysis did take into account the debt incurred in starting an agricultural operation. This would not apply to ongoing agricultural operations, which would therefore be in a more favorable financial situation.

45. Comment acknowledged. The EIR has been revised to eliminate the reference (at pages ii and 67) of economic non-viability as mitigating the impact of the loss of prime farmland. (See Section *V. TEXT AMENDMENTS.)* However, it is valid to state that the lack of economic feasibility of agricultural production on this site reduces the severity of the agricultural impact of this project.

agricultural lands in Santa Clara County. We request that this reference on pages 50, 67 and 212 and Appendix B be omitted from the FEIR.

46 In closing, we urge that the decision-making process be given sufficient time to carefully consider all the possible long-term ramifications of this project. Due to its unprecedented nature in several respects, it would not be wise to make a hasty decision without thorough study and evaluation of the potential consequences of this project on both the proposed site and future county land-use decisions.

Sincerely,

Camas Hubenthal

Camas Hubenthal
Legislative Advocate

46. Comment noted. No response required.

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Greenbelt Alliance

PEOPLE FOR OPEN SPACE

May 2, 1996

Juanell Waldo
Santa Clara County Office of Advance Planning
County Government Center, East Wing
70 W. Hedding Street
San Jose, CA 95110

Re: Lion's Gate Reserve (Hayes Valley) DEIR

Dear Juanell:

We appreciate the opportunity to comment on the Hayes Valley DEIR. We have a number of concerns regarding this project and would like them to be thoroughly addressed through the Final EIR.

Issue #1: The overall scale of the development is not consistent with the County General Plan

1 Although we applaud the permanent open space designation for 1,265 acres out of the 1,676 acre site, that still leaves over 400 acres of development, covering 25 percent of the site and most of the actual Hayes Valley itself. We believe the scale of the ancillary facilities, when combined with the housing cluster, go beyond the County General Plan's intent to keep the area rural. We do not believe that the project consisting of 45 units of overnight accomodations, 41 houses, a 250 space parking lot, a million square feet of grading, a total of over 85,000 square feet of buildings including a 29,000 square foot clubhouse and a 6,000 square foot maintenance facility constitutes a "low intensity" recreational development. The overall mass of the clubhouse and adjacent overnight cottages is quite large.

2 The County General Plan (R-LU 16) states that Hillsides should be "preserved largely in natural resource-related and open space uses in order to support and enhance rural character", while R-LU 18 states that allowable uses include "parks and low-density recreational uses and facilities and commercial...uses which by their nature require remote, rural settings; or which support the recreational or productive use, study or appreciation of the natural environment." R-LU 25 goes on to state that non residential land uses allowed in hillsides areas shall be of a 3 "generally low density or low intensity nature, depending on the use, as is consistent with the basic intent of the hillsides designation to preserve the resources and rural character of the land."

4 The DEIR states that "...the proposed ancillary development to the golf course, particularly the clubhouse/overnight accomodations, conforms with the intent of the General Plan and Hillside zoning ordinance that such development be low in density and intensity, in keeping with the rural character of the area....". The DEIR further states, "The number of units is not inconsistent with the scale of the overall project and the proposal to situate units on the side of the lower foothills minimizes their intrusiveness and bulk." We disagree with these statements and would like to 5 see some evidence of this. The DEIR is lacking any realistic visual analysis of the project such as a computer simulated overlay of the development areas on the existing landscape. The only attempt at this was a woefully inadequate photo simulation (page 147, figure 16) which looks like little white blotches on a fuzzy photo taken from one location. Before a decision can be made whether

continued

N. Response to Greenbelt Alliance

1. Although the proposed development area includes a 410-acre area of the site (including the 263-acre golf course), the actual coverage of this area is quite small and cannot be considered as anything but low-intensity. The Floor Area Ratio (ratio of total floor area to total site area) or FAR of the golf course facilities is less than 1 percent of the golf course area, compared with typical suburban FARs of 40 to 60 percent for industrial park or commercial retail developments. The FAR of the residential component is approximately 3 percent, compared with 30 to 40 percent for a typical suburban tract subdivision. The impervious surface coverage by the golf course and residential components, including all structures, roads, parking areas, driveways and cart paths is 6 percent over the 410-acre development area, and 1.5 percent over the entire project area. Compared with 40 to 50 percent for industrial park or commercial retail development, these coverages reflect a very low intensity of land use. Applying traffic generation as a measure of land use intensity, the total project would generate approximately 1.5 trips per minute during the p.m. peak hour, which is an extremely low rate compared to typical suburban development. These figures demonstrate that the proposed project is indeed low-intensity in nature.

2. As discussed in Section II of the DEIR, the proposed project conforms with the "Hillsides" designation of the County General Plan, and the provisions of the Hillside (HS) Zoning District. Section 14-4.2(b) of the HS zoning regulations specifically permits all of the uses proposed including clubhouse, overnight accommodations, swimming pool, tennis courts, and bar and restaurant. Also permitted under HS zoning regulations are corrals and caretakers residences. Thus the proposed project is not an inappropriate use for the site according to the applicable County General Plan and zoning requirements.

3. As discussed under Response #1 above, the proposed project represents a very low intensity use of the site.

4. On April 18, 1995, the Board of Supervisors approved the recommendation of the Planning Commission that pending golf course use permit applications (specifically the Lion's Gate and Los Gatos County Club projects) not be required to wait for completion of study of "Hillsides" zoning ordinance, as recommended in General Plan implementation recommendation R-LU(i) 9. This implementation was to specify maximum permissible sizes of facilities allowed in conjunction with golf courses, including clubhouses, overnight accommodations, and restaurants. The Planning Commission findings in support of the recommendation stated that the golf course proposals did not involve facilities that appeared to be out of scale relative to the size of the golf courses. It is important to note that, at that time, the proposed Lion's Gate project included 60 units of overnight accommodation, which has since been scaled back to 45 units.

   The finding required in the HS portion of the zoning ordinance to determine the appropriateness of the overnight accommodations is that they be "consistent with both the scale of the golf course development and the rural character of the zoning district." The proposed overnight accommodations would be constructed as a series of adobe cottages following the natural contours. Having a low profile and with much variation in building planes and rooflines, these units would not appear as a massive hotel but would blend in with the surroundings. The total floor area of the overnight complex would be approximately the same as the clubhouse itself, and thus would be consistent with the scale and character of the clubhouse, which also would be built in the adobe style. It should also be noted that the original proposal included 60 overnight

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units, but this was scaled back to 45 units when the 9-hole academy course was eliminated from the project.

In addition, overnight guests could make up approximately 50 percent of the total golf rounds, with the remainder comprising daily fee users. Thus the overnight accommodations would not result in turning the golf course into a resort for out-of-town visitors. As such, the scale of the overnight accommodations would be consistent with the scale of the golf course development.

5. The comment refers to Figure 16 of the DEIR, which is an artist's rendering. Since the only vantage point from which the project would be visible to the public from off-site locations is from the east, the rendering was done from that vantage point. (As noted in the DEIR, there is one private residence with views over the site from the ridge to the north.) The rendering shows that with the landscaped frontage berms in place, very little of the project would be visible from off-site locations to the east. The homes to north, near Highland Avenue would be as close as 200 feet from the road, while the majority of the homes would be at least 1,400 feet from the roadway behind the lake. All of the homes would be screened by the landscaped berm along Turlock Avenue, although some homes would be partially visible through occasional breaks in the berm. To the south, the equestrian center would be located at least 300 feet from the roadway, and would be partially visible through breaks in the berm and through the opening for the access road to the equestrian center. Along the frontage of Coolidge Avenue to the north, the homes would be set back at least 300 feet from the roadway and would be screened by landscaped berms and a vineyard or orchard to be planted in the setback area. Some of the homes may be partially visible through breaks in the berm. During the first few years after project completion, the homes and equestrian center along the eastern project frontage would be more visible until the landscaping planted on and along the berms matures to provide the intended visual screening. The rendering shown in Figure 16 shows frontage landscaping in a mature state. Since no other aspects of the project would be visible from public roadways or inhabited areas, no further illustrations of visual impact are necessary. However, the DEIR does contain site plans for the golf course and the residential areas, as well as renderings of the clubhouse complex to provide visual illustrations of these aspects of the project.

6 this project is truly "low-intensity", decisionmakers must have a much better visual sense of its bulk within the context of the setting.

7 In addition, we have no way of judging whether any number of units of overnight accomodations is consistent with the scale of the overall project since the County has not completed its study to determine an appropriate density for overnight accomodations. We believe that if there is a need for overnight accomodations, they would be better situated in Morgan Hill where other services and infrastructure is already in place and where the project could benefit the City's local economy and its downtown. Overnight accomodations on this site, we believe, unneccessarily push the overall scale of this development beyond a low intensity and rural character enhancing development.

8 One additional General Plan policy, R-PR 14, states: Privately owned recreational lands uses and facilities within rural unincorporated areas, ...should be compatible with the landscape and resources of the areas in which they are proposed. To ensure such compatibility, potentially significant impacts often associated with such land uses should be avoided or reduced to less than significant levels, including *(edited for brevity)*:

- water demand
- traffic generation
- waste water generation and disposal
- alteration of the natural topography, drainage patterns
- visual impacts

We disagree that these five areas have been reduced to less than significant levels.

Issue #2: To adequately address the overall growth inducing impact of the development, an open space easement should be required over the golf course parcel and a more careful analysis is needed on the impact of the package sewage treatment plant and community service district

9 On page 43, the DEIR states that the project proposes no dedication of development rights, conservation or open space easements over the lands intended for the golf course. Although technically and legally, the County cannot require this, we strongly urge the applicant to allow an open space easement over the golf course similar to the Brandenburg Golf Course planned next to the Calero Reservoir in San Jose. If the developer does not plan on expanding housing or other development onto the golf course, then we do not see any reason not to voluntarily offer an open space easement to put to rest the concern over potential future development along the golf course.

10 The growth inducing impacts of the package sewage treatment plant and community services
11 district has not be adequately analyzed. What would prevent a new community services district from expanding its scope in the future and servicing more development in the area?

Issue #3: A portion of the permanent open space area does not meet County standards

The permanent open space areas around the cluster subdivision should not be counted towardthe 90 percent total as it is tucked in an around residential development and not contiguous to the other
12 large area of open space. The public value of this is very small, and aside from providing space for berms along the roadway, it primarily serves to benefit the homeowners or the golf course. The 40 plus acres in the southeast corner includes a buffer area around the residential lots, a 4-foot berm along Turlock Avenue, a 20 acre lake and a 20 acre equestrian center. How does the equestrian center and the caretaker's residence constitute dedicated open space? The berms should be required anyway for visual roadside mitigation, the lakes serve the housing development and the

page 2

6. The issue of project intensity is discussed in Response #4 above.

7. The 45 units of single-story overnight accommodation would comprise approximately 34,000 square feet of floor area. This represents 0.3 percent of the total golf course area, 0.2 percent of the total development area, and 0.05 percent of the total site area. This does not represent 'urban' scale or intensity, or a development that would significantly affect the rural character of the area, particularly considering that the overnight units would not be visible to the public from off-site locations. (See also Response #4 above.)

8. The five topic areas enumerated in the comment have all been fully addressed in the EIR, which includes mitigation measures to reduce all potential impacts to less-than significant levels. Without more specific information on particular points of disagreement, it is impossible to respond in further detail to this comment.

9. Comment noted. No response required.

10. All of the components of the package wastewater treatment facility would be sized to serve only the Lion's Gate project. It would be very difficult if not impossible to add to the system at a later date to accommodate additional development. The proposed treatment plant site is in a constrained location with very limited area available for expansion. Additionally, it would not be possible to expand the effluent disposal pond, and there are no suitable locations for additional ponds nearby. Also, new pipeline would have to be laid and pump stations added. Moreover, it is unclear what the incentive would be to the homeowners association and the country club for tolerating the inconvenience and nuisance of a system expansion that would not benefit them.

11. The Community Services District could increase the scope of its activities within its boundaries to encompass services such as the maintenance of streets, storm drains, lighting and landscaping. The boundaries of the CSD could not be expanded without approval from LAFCO.

12. The hillside cluster subdivision and main access road comprise 109.3 acres of the site. The amount of open space required to fulfill the 90 percent requirement is 983.7 acres. The proposed open space area comprises 1,265.7 acres, which represents an excess of 282 acres above the required amount of open space. It is clear from reviewing the project site plan that there is far more than the required 983.7 acres "configured as large, contiguous and usable areas" as stipulated in General Plan Policy R-LU 20. The project includes within the permanent open space areas approximately 60 acres to be used for landscaped berms, buffer areas, the equestrian center and the lake. These areas are included because they are also intended to be owned and managed by the homeowners association. It should also be noted that the above policy language refers to "areas," indicating that the open space area need not comprise a single contiguous area.

golf course, the equestrian center serves only the housing development and the other open space in between benefits only the housing development. Why should this be included as part of the 90 percent dedicated open space with such minimal public benefit?

The County General Plan states in R-LU 20 that "those portions of the land permanently preserved as open space shall be configured as large, continguous and usable areas. This portion (southeast corner) of the dedicated open space does not meet this criteria and should not be counted toward the 90 percent total. An equivalent number of acres should be found to add to the contiguous portion of open space.

Issue #4: The terms of the open space easement have not been described

13 We believe it is important to have the actual restrictions on the open space easement spelled out clearly. We assume the County would hold the easement, but would recommend that it be jointly held by the Santa Clara County Open Space Authority.

Issue #5: The traffic impact analysis is not sufficient

14 Lacking from the analysis is the traffic impact during the time that children are going to school. The Final EIR should also include the expected daily and annual average number of trips and include evening events at the clubhouse and what impact an increase traffic flow would have on the local community when large events are planned.

Issue #6 Rationale for loss of agricultural lands is not appropriate

On page 50 of the DEIR, we disagree with the statement that the loss of ag lands is not significant because the site is "Not economically viable for cultivation." We do not agree with the analysis on page 67 (supported by the analysis in the appendix) that this farm would cover costs, at best, with no return on investment. Depending on a whole host of variables, farming can be
15 economically viable in the South County. This argument can and has been made to justify the wholesale conversion of prime agricultural lands all around the South County. Year after year, farmers who wish to cash out and develop their land list a litany of reasons why their land can't be farmed anymore. Virtually any parcel of agricultural land can be studied with the same conclusion depending on what factors are used in the analysis. We request that the reference of lack of economic viability on page 50, 67 and 212 be omitted from the FEIR.

16 We also disagree witht the statement on page 66 that the "use of a 20 acre portion of the (farm)field for the equestrian center would represent an agricultural use and would not be counted as a loss of farmland." Does the County consider equestrian centers true agricultural uses?

17 We can accept the mitigation of the permanent loss of 110 acres of prime agricultural land by planting vineyards over 110 acres.

Issue #7 Riparian Corridor Impacts Should be Reduced

18 Page 27 of Draft EIR states that short reaches of tributary drainages would be rerouted or piped to accomodate fairway layout and along the West branch of the Llagas Creek, two locations where small meanders would be removed. Why is this necessary? What options were studied to reduce the number of stream crossings?

19 On page 49 of the DEIR, the clubhouse parking area is proposed for a minimum of 75 feet from the creek bank and in some instances the edge of the turf is proposed as close as 25 feet. Setbacks of as small as 10 feet are being proposed to protect habitat values. This is too narrow. We also are

page 3

13. The open space area would be held under the ownership of the homeowners association. As required in the 1995 County General Plan, the project would include the dedication of an easement to the County over the permanent open space area.

14. Safe routes to school are an important aspect of a community; however, in this case the potential for impacts are extremely minor. First, there are no public schools close to the project site. Secondly, the project trip generation during the hour before school starts (a.m. peak hour) is relatively light with only 57 trips total on all local streets.

It is estimated that this project would add approximately 1,050 daily trips to the local streets. It is reasonable to assume that the annual trip generation would be 365 times this amount, or 383,250 trips.

The traffic study focuses on the peak commute hours because these two hours of the day typically carry more traffic than the other 22 hours. This approach is also consistent with the Santa Clara County Congestion Management Agency Guidelines for Traffic Impact Analyses. Since only moderate delays were shown for peak hour traffic conditions, evening and weekend traffic would operate with relatively light volumes and delays.

The traffic added by the occasional larger event at the project site (e.g., banquets, tournaments, weddings) may attract up to several hundred participants. The busiest traffic period for these events typically is immediately following their conclusion. However, no significant impacts are expected because of the relatively low background volumes. For example, the maximum sized event that could be accommodated at the proposed banquet facility is 200 guests, who would arrive in about 100 cars. If all these guests left in the same hour, the traffic generated would be about the same as p.m. peak hour trip generation. However, the impact would be lower than the p.m. peak (which would experience no significant impact), due to the lower background traffic levels during such events, which would tend to occur on weekends.

15. The agricultural feasibility report prepared by Dr. Niles was unclear with respect to a key element of the analysis. That is, although the family farm scenarios assumed no land costs and reduced property taxes under the Williamson Act, the cost of starting up a new farming operation was factored into the cost analysis (this latter information was not clearly explained). These start-up costs, which include land preparation, the cost of walnut trees, and the cost of planting, were factored-in to make these scenarios somewhat realistic. In the San Joaquin Valley example, there are no such start-up costs to be paid off, and therefore that operation is economically viable while the project case would not be. By the same token, Dr. Niles study was not meant to imply that existing agricultural operations in Santa Clara County are not economically viable, particularly since most of these operations are probably not carrying debt for start-up costs.

The EIR has been revised to eliminate the reference (at pages ii and 67) of economic non-viability as mitigating the impact of the loss of prime farmland. (See Section *V. TEXT AMENDMENTS.)* However, it is valid to state that the lack of economic feasibility of agricultural production on this site moderates the severity of the agricultural impact of this project.

16. The HS zoning regulations permit agricultural uses including large animal husbandry, provided that the number of animals shall not exceed one animal per two acres. Since the lot upon which

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the equestrian center would be located would comprise the 1,265-acre permanent open space area, it is the County's position that the above intensity requirement would be easily met for the 20 to 30 horses proposed. It should also be noted that although the zoning ordinance would permit keeping of one horse on each such lot (which would be two acres or larger in size). The CC&Rs for the project would prohibit the keeping of horses on the homesites themselves. Instead, the residents would keep their horses at the equestrian center, which would be available only to residents of the Lion's Gate Reserve. Keeping the horses in one location at the equestrian center would be far superior environmentally because of the stable management, manure management and drainage control measures that would be implemented, which would not be required for keeping of horses on individual residential lots.

17. Comment noted. No response required.

18. The minor alterations to the on-site drainages are included in the golf course design to improve the layout and playability of the course. With respect to the meanders, there are actually no plans to remove the existing oxbow and meander from the main creek channel. The DEIR erroneously stated that the meanders would be removed, a conclusion which was based on a review of the overall golf course plan. However, the more detailed grading and drainage plans do not show grading or vegetation removal in the vicinity of these meanders. The golf course designer, Robert Trent Jones II, confirmed that these meanders would not be removed, and that they were simply omitted from the more general overall site plan. The EIR has been revised to incorporate this corrected information. (See Section *V. TEXT AMENDMENTS.*)

    With respect to stream crossings, the applicant has revised the development plan to eliminate 5 golf cart bridges, leaving 8 cart bridges and 3 roadway crossings. (See revised Figures 9b and 10a in Section *V. TEXT AMENDMENTS.*) Since the main creek channel runs through the center of the golf course, the planned number of crossings is not excessive considering the one-mile reach of creek channel involved.

19. The setbacks were recommended by H.T. Harvey and Associates, ecological consultants for the DEIR, who believe these distances are adequate for the various conditions noted, considering the degraded state of the riparian habitat.

concerned at the statement on page 128, "In areas that do not support canopy for a distance of at least 100 feet, the buffer should measure 10 feet from the top of the bank." This seems to imply
20 that any existing canopy under 100 feet could be encroached upon by development up to 10 feet from the bank. This is not acceptable.

21 We also request that the Final EIR provide very specific drawings to show the width of the buffer zones and other changes proposed to waterways.

Issue #8 Cumulative Impact Analysis

We disagree with the third paragraph on page 212 which states that the "character of this area is
22 essentially a mixture of urban and rural uses. Therefore, these projects do not represent a fundamental change in the character of the area, individually or collectively, but are incremental additions to the ongoing gradual shift from a rural to a more urban character".

A review of the County General Plan indicates that, although San Martin will continue some additional rural residential growth, the area around Hayes Valley will not be shifting from a rural to
23 a more urban character. San Martin residents, backed by County policies, will continue to support efforts to keep San Martin a rural community. Hayes Valley and its immediate surroundings is very definitely a rural area and should stay that way if the County General Plan is complied with

Issue #9 Alternatives to the Proposed Project

We believe the DEIR underestimates the reduction of impacts of the "Lower Density Alternative"
24 described on page 219. By reducing the overall scale of the ancillary uses, particularly by eliminating the overnight accomodations and the size of the clubhouse facility, the project would be closer to compliance with the General Plan's "low-intensity" recreational use policies and would be more in keeping with the rural setting.

Furthermore, we would like to EIR, on page 225 under "Growth Induced by Increased
25 Infrastructure Capacities" to reflect that the wastewater treatment and disposal and water pipes would be sized for the ultimate size of the development, including a reduced scale project and to offer some means to assure that the size of the treatment plant would not be increased in the future.

Issue #10: Inaccurate Portrayal of Hayes Valley as "Low Priority" Open Space Preservation Site

Page 71 incorrectly states that the Hayes Valley site was identified as a low priority (rated #26
26 out of 42) for open space preservation. Actually, the Preservation 2020 report studied a total of 61 areas for open space preservation and only listed 42 out of those as having priority. Thus, out of all of the the study areas, Hayes Valley ranked among the top half (out of 61), which does not make it a "low" priority.

We look forward to your responses to our comments as well as a bona fide visual analysis of the development. Thank you.

Sincerely,

Vicki Moore

Vicki Moore
Associate Policy Director

20. For greater clarity, the referenced statement has been revised as follows: "In areas where canopy is absent for a distance of at least 100 feet..." (See Section *V. TEXT AMENDMENTS.*)

21. The buffer zones can be seen in Figure 15, the Riparian Habitat Restoration and Enhancement Concept, as revised. (See Section *V. TEXT AMENDMENTS.)*

22. It is important to note that the cumulative impact analysis referenced in the comment considered approved or pending projects in San Martin and Morgan Hill, which has its southern City limits approximately one mile north of the project site. This is the "area" within which the project could contribute incrementally to cumulative impacts. This area currently includes urban (or suburban) and rural uses, and the overall trend within this area, which is dominated by trends in Morgan Hill, is toward urbanization. However, within the immediate area of the project, it is more accurate to characterize the trend as being a gradual shift from rural agricultural undeveloped land use to developed rural residential land use. This trend has been institutionalized in the San Martin Planning Area policies of the General Plan, which designates most of the area in the project vicinity for Rural Resident development. The EIR has been revised to add this more specific discussion for the immediate project area. (See Section *V. TEXT AMENDMENTS.*)

23. As noted in Response #21 above, the area in the immediate vicinity of the project will continue to undergo a transition from rural agricultural undeveloped land use to developed rural residential land use, in conformance with the County General Plan.

24. As discussed in Responses #1 and #7 above, the clubhouse and overnight accommodations element of the project already comprises a very small proportion of the overall development area. The total area covered by these facilities and the parking areas comprises 1.1 percent of the total golf course area, 0.7 percent of the total development area, and 0.17 percent of the entire site area. Since this already represents a very low intensity of development, the analysis of a lower intensity development would show a negligible difference in environmental effect.

25. The referenced discussion on page 225 contains essentially the same statement as the one requested, as follows: "The wastewater treatment and disposal system proposed for the project would not have any excess capacity beyond what is needed for the project." Since all development rights on the project site would be taken by the project, it is difficult to envision off-site locations for which extension of sewer service would be desirable or practical given the distances from the treatment plant and the low density of Rural Residential development allowed in the vicinity under the General Plan. Even if a treatment plant expansion were to be proposed, the operating permits from the County Department of Environmental Health and the Regional Board would require modification, and the required expansion of the Community Services District would require the approval of LAFCO.

As a practical matter it would be difficult to expand the treatment system once it is installed. All of the components of the package wastewater treatment facility would be sized to serve only the Lion's Gate project. That is, the treatment capacity would be limited to 30,000 gallons per day, which represents the peak daily flows from the project as proposed. It would be very difficult if not impossible to add to the system at a later date to accommodate additional development. The proposed treatment plant site is in a constrained location with very limited area available for expansion. Additionally, it is not possible to expand the effluent disposal pond given its location on top of a knoll, and there are no suitable locations for additional ponds nearby. Also, new

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pipeline would have to be laid and pump stations added. Moreover, it is unclear what the incentive would be to the homeowners association and the country club for tolerating the inconvenience and nuisance of a system expansion that would not benefit them.

26. The Open Space Preservation report covers a total of 61 study areas, but not all of these study areas contain open space areas targeted for preservation, of which there are only 42. A ranking of 26 out of 42 places Hayes Valley site in the mid-range of priority for open space acquisition. The EIR has been revised to incorporate this new language. (See Section *V. TEXT AMENDMENTS.)*

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Friday, April 3

Juanell Waldo
Santa Clara County Planning Department
70 West Hedding, 7th Floor
San Jose, CA 95110

Dear Ms. Waldo:

The following are comments by the Santa Clara Valley Audubon Society (SCVAS) on the Lion's Gate Reserve EIR. SCVAS has approximately 4000 members in the County, including many in the south County area. We have been involved in the numerous golf course development proposals around the County, and I also represent one of the environmental constituencies currently reviewing the County's golf course guidelines. These comments are simply listed for convenience.

Alternatives

1 An alternative should be studied which would allow residential and perhaps agricultural development to proceed while assuming that the CUP for the golf course is denied. This would essentially reflect what the property owner could do "by right" under the current zoning. The "No General Plan Amendment" alternative does not suffice, in that it still assumes a CUP for a golf course is granted.

This would allow the County Board to accurately weigh the impacts of the proposed golf course to the impacts of residential development. In terms of water consumption, land altered, cutting and filling required, and several other measures of potential environmental impact, a purely residential development would doubtless show greatly reduced potential impacts.

This same concept was discussed in the Boulder Ridge proposal. The County should have drawn on the comments produced in those hearings to shape the alternatives for this project.

22221 McClellan Road, Cupertino, CA95014 Phone 408 • 252 • 3747 Fax 408 • 252 • 2850

O. Response to Santa Clara County Audubon Society

1. Comment noted. The EIR has been revised to include an analysis of the requested alternative. (See Section *V. TEXT AMENDMENTS.*)

Riparian Issues

While the EIR states, "Impacts to the riparian habitat would be avoided to
2 the extent feasible," the project as proposed does not achieve this goal. Instead, the project relies on mitigation to compensate for losses to riparian values.

The project would generate at least 15 roadway or cartpath crossings of
3 the West Branch Llagas and its tributaries. Two of these would be at least 62' wide, while the others would be smaller. Combined, the result will be a major fracturing of the riparian corridor in the area.

Continuity of riparian habitat is important to many species. A discussion of the continuity of habitat currently, under the project as proposed, and under the project with changes (see below) should be included in the EIR, with those impacts better quantified.

In addition, the EIR should contain more information about nesting and
4 breeding of birds and other wildlife on the site. Now would be the right time of year to be looking for nests and fledglings. Many bird species nest primarily in less disturbed areas of habitat, especially areas of more dense canopy cover and little human intrusion. This project will disturb much of what little dense canopy cover exists near the West Branch Llagas, and nearly all the better quality riparian habitat would be subjected to human disturbance.

Several changes to the project should be considered to avoid these impacts and enhance the riparian zone.

5 -First, the layout of the course in particular and the development in general should be altered to reduce the number of creek crossings.

-Second, setbacks of the course from the riparian areas should be increased. No doubt, the course will intrude on the creek, but these places
6 should be carefully planned. Currently, holes 2, 6, 7, 8, and 9 all play immediately adjacent to the main creek, and other holes play adjacent to tributaries. A setback goal should be made, and then areas that infringe on that setback should be compensated for by other areas with increased setbacks.
7 Further, the holes should be designed so that poor players will not often be hitting balls into the creek, then ignoring the signs and walking into the creek area. Setbacks and holes that play away from the creek would help solve this.

-Third, some areas of dense, undisturbed habitat should be created to
8 accommodate nesting and foraging of species more sensitive to human intrusion (such areas are sometimes called "refugia").

-Finally, the project proposes to remove two meanders from the main creek. This impact should be avoided. Meanders are natural to most creek

2. As noted in the DEIR, the riparian areas along West Branch Llagas Creek have been severely degraded by cattle grazing over the years. There are few mature riparian trees and no understory. The plant species present along the creek are those typically found in the adjacent non-native annual grasslands. Consequently the habitat value of the creekside area is very low compared to pristine riparian corridors. A recent reassessment of riparian vegetation based on detailed field measurements found that 0.83 acres of riparian vegetation would be removed. In addition, the existing degraded habitat along West Branch Llagas Creek would be restored at a ratio of 3:1 and enhanced through a comprehensive planting program, as discussed in the DEIR.

3. Subsequent to the release of the DEIR, the applicant revised the golf course plan to eliminate 5 golf cart bridges, leaving 8 cart bridges and 2 roadway bridges in the plan. (See Section *V. TEXT AMENDMENTS.*) All of the proposed bridges would span the creek channel without placing piers or abutment walls in the channel itself. Sufficient room would remain under the bridges to allow for wildlife passage. As noted on page 128 of the DEIR, the turfed areas adjacent to the riparian corridor are used by wildlife, and thus would not inhibit wildlife movement along the creek. Thus the function of the riparian zone as a movement corridor would not be interrupted by the bridge crossings.

4. As discussed in the DEIR and the supporting biological reports in Appendix F, the project site was subject to extensive field surveys for a number of wildlife species. Those surveys were primarily focused on species of special concern such as the golden eagle, burrowing owl and other raptors, the San Joaquin kit fox, herptiles such as the California tiger salamander, the western pond turtle and red-legged frog, and invertebrates such as the Bay checkerspot butterfly and Opler's longhorn moth. All of these surveys were conducted at the appropriate time of year for each species. In addition, pre-construction surveys would be required during the breeding season for the bird species to ensure that no new nests have been established that may be subject to project impacts, with avoidance required if such new nests are found.

5. As noted in Response #3 above, 5 of the 13 cart crossings originally proposed have been removed from the golf course plan.

6. As discussed on pages 127-8 of the DEIR, the golf course plan conforms with setback requirements for varying environmental conditions, as established by H.T. Harvey and Associates, a well-qualified ecological consulting firm.

7. Two of the 18 holes cross the creek channel. In both instances tee boxes are planned on the opposite side to provide the option of not playing across the creek, and signs would be placed prohibiting golfers from entering the creek. Golfers who lose their ball in riparian habitat would not be assessed a penalty stroke for continuing with a new ball, thus further reducing the tendency for unauthorized incursions. No tree or shrub planting is proposed at the points where the two holes across the creek channel (and where the current habitat value is minimal), so occasional unauthorized incursion by golfers into these areas would not result in significant impacts. In addition, information would be distributed to golfers regarding the value of the riparian corridor and the importance of not entering it

8. In addition to the areas of riparian habitat enhancement along the creek channel, the project includes the preservation of 460 acres of valley oak woodland and over 500 acres of non-native grassland, including all of the on-site serpentine grasslands. In addition, new habitat areas would be created for the California tiger salamander and the western pond turtle.

9 systems and serve important hydrodynamic processes. Removing meanders often leads to increased up or downstream erosion, necessitating future erosion control measures.

Is This "Low Intensity," Rural Development

10 The EIR seems to state that because each of the individual uses (golf course, large clubhouse, overnight accommodations, conference rooms, swim and tennis club, equestrian center, restaurant, residential housing, vineyards) of the site could be consider "low intensity, low density," then the project as a whole complies with County General Plan policies. This is false logic. The EIR should discuss whether the conglomeration of many "low intensity" uses makes this a high intensity project, and which of the various uses should be sacrificed to bring down the level of overall intensity.

Misc.

11 The project should consider using decomposed granite or another permeable surface for the golf cart paths. Such surfaces are evidently functional on lesser slopes such as these and would decrease the amount of impervious surface.

12 Why does the swim and tennis center need its own clubhouse? The layout of this facility should allow for use of the main clubhouse, which will have much the same facilities.

13 The project plans introduction of mosquito fish to the site. There should be assurances that the fish can not move off site or to on site creeks, as they interfere with native species.

14 Lakes and ponds on the site should, where possible, be vegetated with natives. Many courses put turf grass to the edge of their lakes and erect walls or hardscape borders around them. Visual and habitat considerations benefit from more natural looking waters.

Thank you for considering these concerns.

Sincerely,

Craig K. Breon

Craig K. Breon

9. There are no plans to remove a meander and an oxbow from the main creek channel, as indicated in the DEIR. The EIR erroneously reported that the meanders would be removed, a conclusion which was based on a review of the overall golf course plan. However, the more detailed grading and drainage plans do not show grading or vegetation removal in the vicinity of these meanders. The golf course designer, Robert Trent Jones II, confirmed that these meanders would not be removed, and that they simply were omitted from the more general overall site plan. The EIR has been revised to incorporate this corrected information. (See Section *V. TEXT AMENDMENTS.*)

10. Although the proposed development area (including the 263-acre golf course area) encompasses a 410-acre area of the site, the actual coverage of this area is quite small and cannot be considered as anything but low-intensity. The Floor Area Ratio (FAR) of the golf course component is less than 1 percent, compared with typical suburban FARs of 40 to 60 percent for industrial park or commercial retail developments. The FAR of the residential component is approximately 3 percent, compared with 30 to 40 percent for a typical suburban tract subdivision. The impervious surface coverage by the golf course and residential components, including all structures, roads, parking areas, driveways and cart paths, is 6 percent over the 410-acre development area and 1.5 percent over the entire site area. Compared with 40 to 50 percent for industrial park or commercial retail development, these coverages reflect a very low intensity of land use. Applying traffic generation as a measure of land use intensity, the total project would generate approximately 1.5 trips per minute during the p.m. peak hour, which is an extremely low rate compared to typical suburban development. These figures indicate that the proposed project is indeed low-intensity in nature.

11. Comment noted. No response required.

12. The swim and tennis center requires a building to house showers, change rooms, rest rooms, lockers and the like. It does not make sense to have swimmers driving to the main clubhouse to change out of their wet swimsuits.

13. Mosquito fish would only be used in ponds that are self-contained, such as the reclaimed water storage pond and the irrigation storage pond.

14. As noted in the EIR, the existing pond would be maintained as a wetland, and the new ponds to be created to provide habitat for the tiger salamander and western pond turtle would also include native wetland vegetation.

P

SIERRA CLUB • LOMA PRIETA CHAPTER
San Mateo • Santa Clara • San Benito Counties

May 2, 1996

Juanell Waldo
Santa Clara County Office of Advance Planning
County Government Center, East Wing
70 West Hedding Street
San Jose CA 95110

RE: Comments on DEIR for Lion's Gate Reserve (Hayes Valley) Golf Course

Dear Juanell:

The Loma Prieta Chapter has the following concerns regarding the project as proposed and request that these be addressed in the FEIR. Our concerns range from a general concern that the project is too intensive a development for the rural area to specific requests for clarification.

In general, we believe that the level of development proposed is too intensive for the rural nature of the area. We believe that the precedent set by the package sewage treatment plant and the size and intensity of ancillary uses for both the golf course and the residential development will set the tone for development in the south county for decades. The precedent of this project is even noted in the DEIR. Such a precedent deserves a thorough and deliberate review by the Planning Commissioners. Specifics of these concerns are detailed below.

1 **Massive Building Development** The total mass of buildings proposed for the site, not including residential, is in excess of 85,000 square feet. This is disproportionate to existing and proposed development in the area. The proposed square footage of development includes a club house of 29,000 square feet, proposed cottages/meeting rooms in excess of 25,000 square feet, a maintenance facility of 6,000 square feet, a 1,000 square foot facility to serve the practice facility, a club house at the swim and fitness center of 2,000 square feet, the sewage treatment plant is (I can't even find how many square ft. it is) and the equestrian center which would have numerous buildings, including a 100'x200' foot covered arena + 20 to 30 stalls on three sides (20,000+ square ft), hay storage and a caretaker's residence. This level of development is quite substantial and deserves careful scrutiny.

3921 East Bayshore Road Suite 204
Palo Alto, CA 94303
415-390-8411
FAX 415-390-8497

P. Response to Sierra Club - Loma Prieta Chapter

1. The project cannot be characterized as a "massive building development" by any measure. The Floor Area Ratio (ratio of total floor area to total site area) or FAR of the golf course component is less than 1 percent of the golf course site, compared with typical suburban FARs of 40 to 60 percent for industrial park or commercial retail developments. The FAR of the residential component is approximately 3 percent, compared with 30 to 40 percent for a typical suburban tract subdivision. The impervious surface coverage by the golf course and residential component, including all structures, roads, parking areas, driveways and cart paths, is 6 percent over the development area and 1.5 percent over the entire project area. Compared with 40 to 50 percent for suburban residential subdivision and 80 to 95 percent for industrial park or commercial retail development, these coverages reflect a very low intensity of land use.

   The residential densities proposed are comparable to existing and planned Rural Residential densities in San Martin. In the HS zone, the density is one lot per 36 acres, with proposed dwellings clustered on 2-acre minimum lots as permitted in the HS zone. In the RR zone, the density is one lot per 5 acres, with 2-acre minimum cluster lots as permitted in the RR zone. This is consistent with the prevailing and planned Rural Residential densities in the San Martin planning area.

Overnight Accommodations As written now, the units are only for the guests using the golf course or guests of corporate members. What is the justification for 45 units?

2 Has there been a market study? Is there a reasonable guarantee that this number and approach is economically feasible and the accommodations won't need to be opened up to the public or marketed quite aggressively? Will the limitation on guests be a condition of permit and what approvals will the applicant need to change the limited nature of the guest list?

3 We believe that the analyses of the lower density alternative is incomplete as it only analyzed a project with fewer residential units. We request additional review of the benefits of fewer or no overnight accommodations. If there were no overnight accommodations the development would have less of a commercial feel to it.

4 We understand that the mitigation for the growth inducement or commercialization of the overnight accommodations is limiting access to foot or golf cart only. However, the drawings in the DEIR do not adequately show if the design precludes this from changing in the future. Will the conditions of permit require limited access? If, in the future, cars were allowed to drive to the units, would the applicant need to revise the permit or go through some approval process?

5 Page 18 indicates that the guest cottages may also have some meeting rooms. Exactly how many rooms are proposed? How many meetings annually are predicted? Will Lion's Gate also become a meeting facility? Does this activity require a conditional use permit?

6 Also please specify the total square footage for buildings which will house the rooms (guest + meeting). This was not clear in the DEIR.

Package Sewage Treatment Plant A package sewage treatment plan certainly has

7 some benefits (less potential for increases in nitrate contamination, ability to reclaim the water). As we understand it, each residential development must be able to meet septic requirements. Can the other facilities, clubhouse, guest cottages, swim and tennis center and practice service facility also meet septic system requirements? Where would the leach fields be and was their impact analyzed? What precedent does this set for other

8 medium to high intensity commercial uses in areas zoned hillside? Since, a community service district is needed for the management of such a plant, will this increase the likelihood that we will see more mixed use developments in the future?

9 Since the boundary for the new community services district is set up by LAFCO after the permit is approved, what is to keep the boundary from including more houses or businesses? In other words, what guarantee do we have that this plant will not be growth inducing? Just because the winter storage pond only accommodates the size of this project, what precludes the district from building a second pond?

2. The 45-unit figure is the lowest number considered to be economically feasible by Benchmark Hospitality, the firm that will operate the overnight accommodations. Benchmark operates numerous facilities, including the Squaw Creek Resort at Lake Tahoe and Chaminade in Santa Cruz County. Based on their experience, Benchmark believes a higher number of units could be supported at the site. In fact, the original proposal was for 60 units, which was scaled back to 45 units when the 9-hole academy course was eliminated from the plan.

3. The 45-units of single-story overnight accommodations would comprise approximately 34,000 square feet of floor area. This represents 0.3 percent of the total golf course area, 0.2 percent of the total development area, and 0.05 percent of the total project site area. Since this already represents a very low intensity of development, the analysis of a even lower intensity development would show a negligible difference in environmental effect, and therefore is not justified. Moreover, a complex with fewer units would not be economically feasible according to Benchmark Hospitality, the operator for the overnight complex, as discussed in Response #2 above. It is also important to note that the overnight units would be distinctly residential in appearance, and would not have a "commercial feel." Also, the overnight units would not be visible to the public from off-site locations.

4. As shown in the detailed site plan for the clubhouse vicinity (Figure 10a of the DEIR), the cart paths providing access to the overnight units are 10 feet wide, with sharp curves, and have the units clustered closely along the path. With this layout, it would be impossible to convert these paths into vehicle access drives that would meet County standards. Thus the possibility of future vehicular access is precluded in the site plan itself. Any future proposal to change the site plan would require an application for a use permit modification which would require a Planning Commission hearing. Any thoughts of converting these units to residential would be futile since a General Plan Amendment would be required, and the General Plan contains no residential categories that could be used for such a conversion.

5. There would be one meeting room for every 2 units, or no more than 23 meeting rooms. These meeting rooms would be quite small at 500 square feet, and would accommodate meetings of only a few people. It is unknown how many meetings would be held here. It should be noted that the primary attraction in staying here would be the golf course, so any meetings would be incidental to playing golf. The overnight accommodations, including the meeting rooms, would be included in the conditional use permit for the entire golf course facility.

6. The floor area of each of the 45 overnight units would approximately be 500 square feet for all of the units. Each of the 23 meeting rooms would also be approximately 500 square. Thus the total floor area of the overnight accommodations would be approximately 34,000 square feet.

7. The septic requirements for the golf course and related facilities could be met on the site with leachfields, although both the County Department of Environmental Health and the Central Coast Regional Water Quality Control Board have indicated that a package treatment plant would be much preferable from a water quality standpoint.

8. This would be the first package treatment plant to be built in the County. (Although a package treatment plant was previously approved for the Gilroy Hot Springs project, that development has been since downscaled and will now utilize leachfields.) However, it is not the first instance of a CSD formed in the County to operate and maintain a community wastewater treatment system. (The Lake Canyon area in the Lexington Basin has a CSD to administer the community

10 How large will the actual treatment plant be? While we find its location on the maps, we are unable to find a discussion on its size, bulk, or visual impact. Please provide this information.

11 What are the "fast growing trees" which are proposed to be used to screen the holding pond?

12 **Equestrian Center** This is a large equestrian center, that may seem more like a commercial operation than agriculture to many, and it is in the area designated as "permanent open space." Is the size of buildings and level of activity consistent with the agricultural uses allowed under the policy? Is the caretaker's residence allowed under the policy? Will the operations need a conditional use permit or be included in the cluster development permit? Will there be a condition of permit precluding lessons,

13 rentals or boarding of horses, aside from boarding horses of those who live in the 41 houses? This is a pretty fancy facility for 41 homes, will operations need to be expanded

14 to pay for the facility? Why are 20 parking spaces required for a facility which will serve only the residential development? Will the storage of horse trailers be provided on this site? Where?

15 Please specify the proposed square footage of all buildings associated with the equestrian facility.

16 Please evaluate a smaller equestrian facility under the lower density alternative.

17 The manure should be composted on site. Disposal in a landfill is inconsistent with state goals to divert solid waste from the waste stream. The DEIR should include a review to determine where and how a compost facility can meet appropriate permit requirements. We further urge that any composting facility be designed to support a process which reduces the viability of weed seeds.

18 The discussion in appendix D, page 7 states "Because of the limited impervious surfaces associated with the equestrian center, there should be no increase in runoff from the area after the project." Has the runoff from roofs of all of the buildings (100'x200' foot covered arena +20 to 30 stalls on three sides, hay storage and a caretaker's residence, etc.) been factored into that equation? The paragraph further states that the detention pond, while retaining water from a small storm event may not affect flooding from storms greater

19 than 10 years. The EIR does not clearly indicate the impact or mitigations for flooding from this facility. Further, would the flood water which discharges into a "ditch along the road" be contaminated or be a health risk?

20 **Swim and Tennis Center** The narrative indicates that the corporate members of the golf course will also be allowed to use the swim and tennis center, including the 2,000 square foot clubhouse. Is this allowed on the lands designated for "permanent open space?"

wastewater collection and leachfield system.) It cannot be predicted whether similar projects with CSDs would be proposed in the future.

9. Any boundary adjustment for the CSD would require LAFCO approval, which would have to be tied to a discretionary approval by the County for any new project to be included in the CSD. At the time that the boundaries of the CSD are set, LAFCO would also establish a Sphere of Influence for the CSD. Since the objective would be to prevent future expansion of the CSD, the Sphere of Influence boundaries would be made coterminous with the CSD boundary. Any request from property owners outside the CSD for a boundary expansion or annexation to the CSD would require a showing of compliance with the policies governing such annexations, as well as the policies governing expansions of Spheres of Influence. The governing board of the CSD would almost certainly oppose any such annexation request, which would have significant influence on LAFCO's decision regarding such requests.

   As a practical matter, it would be difficult to expand the treatment system once it is installed. All of the components of the package wastewater treatment facility would be sized to serve only the Lion's Gate project. That is, the treatment capacity would be limited to 30,000 gallons per day, which represents the peak daily flows from the project as proposed. It would be very difficult if not impossible to add to the system at a later date to accommodate additional development. The proposed treatment plant site is in a constrained location with very limited area available for expansion. Additionally, it would not be possible to expand the effluent disposal pond given its location on top a knoll, and there are no suitable locations for additional ponds nearby. Also, new pipeline would have to be laid and pump stations added. Moreover, it is unclear what the incentive would be to the homeowners association and the county club for tolerating the inconvenience and nuisance of a system expansion that would not benefit them.

10. The floor area of the wastewater treatment plant would be 2,000 square feet. It would appear as a single-story structure and would be unobtrusive and designed to be compatible with the other on-site structures.

11. Since the holding pond would be elevated relative to the rest of the project, it would only be visible from the single residence on the adjacent ridge to the north, and the future trail along the northern site boundary, which would be 2,800 feet and 1,400 feet from the pond, respectively. Specific landscape species would be identified in conjunction with the Landscape Plan to be approved at ASA.

12. The proposed equestrian center, which would have room for 20 to 30 horses, cannot be characterized as large or commercial in scale. A large equestrian center would be typified by the existing Calero stables at Calero Reservoir, or the proposed equestrian center at the Guadalupe landfill in San Jose, both of which have capacity for 150 horses. Caretakers residences are permitted in the HS Zoning District. It should be noted that the equestrian center is proposed instead of allowing horses to be kept on each lot, as permitted in the HS zone. In the absence of an equestrian center, there would be no manure management plan or drainage control to mitigate the effects of horse stables. The equestrian center would be a private facility for the use of residents only, and would not be a commercial operation.

13. The conditions for the equestrian center would be included in the cluster development permit, since it would be a permitted recreational use within the permanent open space area for the Hillside cluster subdivision. The conditions of the permit would specifically preclude the possibility of expanding the operation to a commercial facility.

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14. The parking layout for the equestrian center would be refined during the ASA process, and would be designed in compliance with the County parking standards.

15. The equestrian center would comprise an enclosed riding area (20,000 square feet), stables (12,000 square feet), caretaker's quarters (1,800 square feet), reception hall (5,000 square feet), and office and display room (3,200 square feet), for a total of 42,000 square feet. A new figure showing the floor plan and building elevations of the equestrian center has been added to the EIR as Figure 10c. (See Section *V. TEXT AMENDMENTS.*)

16. The proposed equestrian facility cannot be characterized as large, compared with other facilities in the area, as discussed in Response #12 above. A smaller equestrian facility would result in a negligible difference in terms of impacts, and fewer impacts than would result from horse stables on each residential lot, as discussed in Response #12 above.

17. It has not yet been determined whether the manure from the equestrian center would be composted or disposed of at an approved landfill. This would be determined in conjunction with the preparation of a Manure Management Plan which would be prepared for ASA.

18. It is important to note that runoff that currently flows through the equestrian center site from the adjacent hills to the west would be diverted around the area and into the large lake, which would compensate for the minor addition of runoff from the new impervious surfaces.

19. As discussed in the DEIR, the paddock and exercise areas would be cleaned of manure daily. The retention pond would dry up in summer when it would be cleaned of accumulated sediments. Given the high maintenance of the equestrian facility, the condition of the runoff stored in the pond would be similar to runoff currently generated on the site or other pastures in the area. During a heavy storm, this runoff would be further diluted and would not pose any greater health risk than flood waters from other agricultural areas. The pond would be sized to contain runoff from a 25-year storm, but would overflow some of its contents in larger storm events. However, since the equestrian facility and the retention basin would be sited outside the 100-year floodplain, they would not be subject to inundation during the 100-year event or lesser frequency events.

20. The swim and tennis center lie within the area of the golf course, and are not located within the area to be preserved as "permanent open space."

21 **Clubhouse Activities** What is meant by "card rooms" in the description on page 20 of what will be included in the clubhouse? What frequency and range in size of events
22 was assumed to determine number of employee and traffic generation?

23 **Practice Facilities** Where is the 1,000 square foot structure which will serve the practice facility located? It does not seem to be on any map. Is this square footage
24 included in the total shown for the other buildings on Table 2?

25 **Night Operations** What night activities are anticipated? If yes, what is the impact of
26 the lighting? Will the hours of operation be addressed in the use permit?

27 **Table 1** Does Table 1 include the area and access road for the maintenance facility?

Table 2 Please expand Table 2 to include information related to the size of the
28 package treatment plant, the number of lakes or detention ponds, the equestrian center, swim and tennis center, practice facility building, and meeting rooms.

29 **Maintenance Facility** The discussion on pg. 98 indicates that all drainage from adjacent paved areas will drain into an advanced filtering and recycling system. Does this include all of the drainage from the maintenance facility, especially from the 20,000 square foot area of impervious surface for parking, wash down and storage? Or does only the wash bay at the rear of the facility drain into this facility? If it all does not go into the filtering/recycling system, to where does the excess drainage flow?

30 **Stream Crossings and Riparian Buffer Zones** We are very concerned about the number of stream crossings required by this project and that the project did not review
31 alternative designs. What options are there for reducing stream crossings? What options exist for retaining the meanders and not piping the reach near the parking?

While we understand that the County's General Plan allows for reduced buffer zones in
32 stream reaches where the habitat is degraded, we are still confused by the meaning of the sentence on page 128, "In areas that do not support canopy for a distance of at least 100 feet, the buffer should measure 10 feet from the top of the bank." Does this mean if there is an existing canopy of 50 feet, that the development can encroach 40 feet into the buffer zone?

Specific information with respect to the width of buffer zones and the various crossings
33 is very hard to discern from the document's graphics. Please provide graphics which more clearly indicate the buffer zones and other changes proposed to waterways.

34 **Wildlife** What is the position of the resource agencies with respect the development and mitigation proposals? Are the mitigation ratios and monitoring plans acceptable?

35 We recommend that a prohibition on the use of mosquitofish be added to the mitigations for the tiger salamander.

21. According to the applicant, the members lounge would include rooms with tables for casual card games.

22. The traffic study focuses on the peak commute hours because these two hours of the day typically carry more traffic than the other 22 hours. This approach is also consistent with the Santa Clara County Congestion Management Agency Guidelines for Traffic Impact Analyses. Since only moderate delays were shown for peak hour traffic conditions, evening and weekend traffic would operate with relatively light volumes and delays.

    The traffic added by the occasional larger event at the project site (e.g., banquets, tournaments, weddings) may attract up to several hundred participants. The busiest traffic period for these events typically is immediately following their conclusion. However, no significant impacts are expected because of the relatively low ambient volumes. For example, the maximum sized event that could be accommodated at the proposed banquet facility is 200 guests, who would arrive in about 100 cars. If all these guests left in the same hour, the traffic generated would be about the same as p.m. peak trip generation. However, the impact would be lower than the p.m. peak (which would experience no significant impact), due to lower background traffic levels during such events, which would tend to occur on weekends.

23. The 1,000 square-foot driving range building would be located near the driving range tee boxes. Figure 10a has been revised to show the location of this structure. (See Section *V. TEXT AMENDMENTS.)*

24. The square footage for the driving range building is not included on Table 2, which is intended to provide a summary of the main project elements, not an exhaustive recounting of all of the project statistics contained in the project description narrative.

25. Activities which would occur in the evening at the clubhouse complex include operation of the restaurant, occasional weddings and banquets, and of course occupancy of the overnight accommodations. Since the clubhouse complex is not visible to the public from off-site locations, there would be no lighting impact from these activities. The swim and tennis center would also operate in the evenings. This facility is well set back from the site frontage on Turlock Avenue and would be visually screened by landscaped berms. As discussed in DEIR Section *III. J. Visual and Aesthetics*, project lighting would be designed to minimize off-site light and glare, and would be subject to ASA review.

26. There are currently no plans to limit the hours of operation for any specific project activity in the use permit, although other laws and regulations may do so.

27. Table 1 does include the area for the maintenance facility and access road within the golf course acreage.

28. Table 2 is intended to provide a summary overview of the main project elements, not an exhaustive accounting of all the project statistics contained in the project description narrative.

29. The statement on page 98 of the DEIR has been revised to indicate that washwater from the equipment washing area and drainage from the chemical mixing area would be conveyed to the water filtering and recycling system. The recycled water would be reused for equipment washdown. This washdown and chemical mixing area would be covered to prevent rainwater from entering the system. The stormwater drainage from the remaining paved areas would be

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directed to grease traps before being released to the storm drain system. (See Section *V. TEXT AMENDMENTS.)*

30. Upon further review of the golf course plan, the applicant has identified 5 crossing points that can be eliminated or combined with nearby bridge crossings. These refinements are reflected in the revised Figures 9b and 10a. (See Section *V. TEXT AMENDMENTS.)*

31. There are actually no plans to remove the existing oxbow and meander from the main creek channel. The DEIR erroneously stated that the meanders would be removed, a conclusion which was based on a review of the overall golf course plan. However, the more detailed grading and drainage plans do not show grading or vegetation removal in the vicinity of these meanders. The golf course designer, Robert Trent Jones II, confirmed that these meanders would not be removed, and that they were simply omitted from the more general overall site plan. The EIR has been revised to incorporate this corrected information. (See Section *V. TEXT AMENDMENTS.*)

32. For greater clarity, the referenced statement has been revised as follows: "In areas <u>where canopy is absent</u> for a distance of at least 100 feet..." (See Section *V. TEXT AMENDMENTS.)*

33. The crossings in the central area of the golf course can be clearly identified in Figure 10a (as revised). Figure 9b has also been revised to more clearly indicate the bridge crossings. Figure 15, the Riparian Habitat Restoration and Enhancement Concept, has been revised to highlight the turfed areas, so that the buffer zones along the creek can be more readily discerned. (See Section *V. TEXT AMENDMENTS.*)

34. The U.S. Fish and Wildlife Service did not comment on the DEIR. The California Department of Fish and Game expressed their concerns in a letter dated May 6, 1996, which is included as Comment Letter A. In response to that letter, several refinements were made to the development plan. A meeting with the DFG biologist Jeannine DeWald was held on the Lion's Gate site on June 24, 1996. At that field meeting, Ms DeWald indicated that her concerns had been generally satisfied with the refinements to the mitigations and the clarifications to the EIR, as discussed in the Response to Comment A in this FEIR.

35. As stated on page 200 of the DEIR, mosquito fish would only be appropriate for the effluent storage pond and the irrigation pond, which would be self-contained with no outlets. As stated, mosquito fish would not be introduced to water bodies with outlets to natural drainages, such as the existing pond and the proposed lake in the residential area.

We are assuming that this construction will occur over a period of a few years. Mitigation for many animals include preconstruction surveys 30 days prior to site
36 development. We are unsure what "site development" means. We, therefore, recommend that the language for "preconstruction surveys" be amended to address any phasing of construction. We also recommend that there be at least one survey per year, appropriate to the species' critical habitat and life cycle, during the entire construction process.

37 **Groundwater** **Page 27 last paragraph in Drainage** Has the impact of discharged into dry wells been analyzed? Why is it even needed as an alternative? We believe that this option should be discarded.

38 **Page 32 first bullet** The narrative states that a minimum vertical separation of 2 feet from high groundwater would be provided. Has the County's Agricultural Inspector given a determination on the recommended minimum separation?

39 We applaud the applicant's intention of monitoring ground water conditions. What bonding or contingency plans will be required in case contamination is detected?

The document states that the amount of nitrates percolating from the property will be reduced through a combination of removing the cattle and the nitrogen uptake of the course turfs. It also states that the contribution of nitrates from the equestrian facility will be mitigated by directing runoff into the lined pond. Were the potential impacts
40 from using pond water for irrigation analyzed? Was the percolation of rainwater in the open areas of the equestrian center analyzed?

It also notes that level of nitrate contamination increases from west to east, with higher
41 concentrations found east of the property. If the amount of water in the aquifer is reduced, will the concentration of nitrates increase in the waters east of the property?

Water Supply While we have found information showing that the average water
42 use is below the safe yield, we were unable to locate the information which shows that peak summer use won't exceed safe yields. Please provide the information which shows that peak summer use will not impact the ground water and wells down gradient.

43 Also, the February 20, 1996 letter from Geoconsultants to Tom Hix states in the conclusions that "...the figures are preliminary in nature. In order to assure that the projected supplies are realistic, a detailed aquifer analyses will need to be performed at the Lion's Gate Reserve. In addition, it may be necessary to perform further studies in
44 the West San Martin and Twin Valley areas." Have these studies been done? If not, will they be required?

36. Grading and construction for the golf course facilities would be completed over a period of approximately 18 months. In the event that there are areas of the project where grading and construction has not commenced before the second breeding season, additional pre-construction surveys would be conducted for those areas.

37. Comment noted. The EIR has been revised to delete the reference to dry wells. (See Section *V. TEXT AMENDMENTS.*).

38. The County Agricultural Commissioner has stated that no numeric standard would be meaningful given the variability of conditions from site to site, and that this issue should be resolved on a case-by-case basis depending on site-specific conditions.

39. The contingency plan to be implemented in the event that contamination is detected is described in detail on pages 101 and 102 of the DEIR.

40. The retention pond at the equestrian center would not be used as a source of irrigation water. As discussed on page 103 of the DEIR, the equestrian area would be cleaned of manure daily, so the potential for nitrates percolating into the soil would be minimized.

41. On page 198 of the DEIR it is stated that the addition of nitrates from golf course fertilizer and wastewater disposal would be roughly equivalent to current nitrate loadings from cattle grazing. However, the estimate of project nitrate loading is conservative and would likely be less given the operating criteria of matching nitrogen applications to turf nutrient requirements. In addition, the nitrate loading analysis did not take into account the nitrogen uptake from the proposed tree planting, which can be substantial (e.g., 20 to 40 lbs per acre). However, if one assumes that there would be no change in nitrate loading on the site, the reduction in groundwater could theoretically reduce the amount of groundwater available for dilution of nitrates downgradient from the site. However, according to Questa Engineering, it is unlikely that an actual increase in nitrate levels in downgradient wells would occur as a result of reduction in groundwater flows from the site.

42. Average annual water demand includes both peak usage during the hot summer months, as well as zero usage during the periods of heavy rainfall in the winter months. The primary purpose of peak demand calculations is to assure that the entire water supply system is capable of producing the required amounts without overdrafting the aquifer. During periods of high demand, water would be taken from the on-site storage pond to prevent stress to the aquifer. In addition, supplemental supplies would be piped from the West San Martin Water Works to the on-site storage pond. The question of when to begin drawing from this supplemental source would be initially calculated based on information obtained during the site testing program. During operations, a downgradient monitoring well located on the site would be monitored constantly during peak pumping periods to observe any drawdown in the water table, which would serve as the indicator of when to suspend on-site pumping and start drawing exclusively from the supplemental sources. In addition, existing off-site wells would also be monitored to ensure that impacts are not occurring to those wells. After the system has been in operation for a period of time, the project geohydrologist would obtain a more refined knowledge of the aquifer characteristics, and would be able to more closely plan for water supply augmentations based on weather conditions and the previous winter's rainfall (or lack thereof during drought conditions).

43. There is no doubt on the part of Geoconsultants that more than sufficient water supplies are available to serve the project from on-site groundwater, in combination with supplemental

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supplies from West San Martin Water Works and Twin Valley, Inc. (The Santa Clara Valley Water District, in a memo dated June 26, 1996, has indicated it concurrence that there is sufficient water available for the project. This memo has been added to the EIR and is included in Section *VI. REVISIONS TO THE APPENDICES OF THE EIR.)* Additional studies will be required prior to construction to define the characteristics of the aquifer, for purposes determining the number of production wells(s) needed, their optimum locations, and in particular to establish setback distances for these new wells to ensure that they do not have an impact on off-site wells. There is no doubt on the part of Geoconsultants that there is sufficient area available on the site so that the required production well(s) can be placed in locations where they would not result in off-site impacts.

44. A detailed hydrogeologic analysis would be performed prior to on-site water usage. (A description of the detailed groundwater investigation is provided in Section *II. OVERVIEW OF MAIN ISSUES DISCUSSED IN COMMENTS ON DEIR, A. WATER SUPPLY.)* The best time for conducting all of these studies is in the late summer or early fall when the groundwater table has reached static conditions. Any investigations conducted earlier in the year would still be influenced by the previous winter's rainfall.

45 The document bases its assessment that the project will not impact the aquifer on studies conducted by Rantz (1971 & 1974). These estimate the rate of runoff, recharge and water loss to evapotranspiration. Does this assessment account for reductions in recharge due to increase water absorption or uptake by course vegetation? Does this assessment
46 include reduction in recharge due to increased impervious surfaces and lined lakes in the recharge area? How many acres of the recharge area are removed by the project? What are the expected decreases in recharge because of this project? What impact will that have on the water table and safe yield assessments?

47 **Traffic** While the analyses of the peak am and pm flows is important it may not be
48 the most relevant measure for this community. Please analyze the impacts during time that children are going to school. Please indicate the expect daily and annual average
49 number of trips that this project would generate. Would increase traffic from night events at the clubhouse impact the community?

50 There is no discussion in the document about contingencies for overflow parking during tournaments or large weekend day events at the clubhouse. Please discuss this issue.

In closing, we urge a thorough review of the impacts from the ancillary use, a detailed aquifer analyses and a review of alternatives which will provide larger buffer zones for riparian areas.

In addition, we urge that the comment period on the DEIS be extended and that the Planning Commission take another tour of this project. We do understand that they did toured the site just over a year ago but we believe that they will benefit from a tour after the presentation on May 2,1996.

Thank you for the opportunity to comment on this project.

Sincerely,

Julia Bott

Julia Bott, Chapter Director

45. Annual groundwater recharge estimates presented by Geoconsultants included losses from retained surface moisture to account for vegetation.

46. The increased acreage of impervious surfaces, such as structures, roads, cart paths, and parking lots, is minute in relation to the overall project acreage (1.5 percent over the 410-acre development area, including the 263-acre golf course area). The proposed lakes would not be lined, and thus would augment recharge rather than diminish it. In addition, the retention basins to be located throughout the golf course would provide further recharge capability.

47. Safe routes to school are an important aspect of a community; however, in this case the potential for impacts are extremely minor. First, there are no public schools close to the project site. Secondly, the project generation during the hour before school starts (a.m. peak hour) is relatively light with only 57 trips total on all local streets.

48. It is estimated that this project would add approximately 1,050 daily trips to the local streets. It is reasonable to assume that the annual trip generation will be 365 times this amount, or 383,250 trips.

49. As discussed in Response #22 above, the traffic added by occasional evening events would not have a significant impact, primarily because of the low background traffic volumes.

50. For events such as weddings and banquets that may occur simultaneously with regular golf course activities, the planned parking areas may not be sufficient. Under these conditions, the available parking area would be maximized by valet parking, which would allow vehicles to be parked closely together. In the event that overflow parking would be required, it would be provided in an area to the north of the planned chipping green on the north side of the main access road, between the driving range and Lot 11 (see revised Figure 10a in Section *V. TEXT AMENDMENTS.)* In this location there is a relatively level area of sufficient size which is away from the creek and otherwise absent of environmentally sensitive features. No parking areas outside the golf course site would be required.

Special parking arrangements such as those described above may also be required for some golf tournaments. In the worst-case situation of a "shot-gun" tournament, 144 golfers would participate simultaneously. However, golf tournaments would not overlap with other events such as weddings. Invariably, there would be a banquet after a tournament so no weddings or other events would be scheduled on a tournament day. It is expected that there would be an average of one tournament per month at the Lion's Gate Reserve.

Q

COLLIERS PARRISH

Colliers Parrish International, Inc.
1960 The Alameda, Suite 100
San Jose, California 95126 U.S.A.
408- 554-8181• Fax: 408- 247-2317

April 25, 1996

Ms. Jaunell Waldo
ENVIRONMENTAL PLANNING
SANTA CLARA COUNTY
70 West Hedding Street, 7th Floor
San Jose, California 95110-1705

Re: **Lion's Gate Reserve Project**
San Martin, California

Dear Ms. Waldo:

This letter is in response to the Environmental Impact Report (EIR) done for Lion's Gate Reserve. I am wonderfully surprised and pleased that the County has required the development of such a project to be put through such a test.

1

This report has been well thought-out and addresses all the issues relating to such a development. I am in full support of this project and feel that such a quality project is needed for our community. The developer seems to have addressed all issues and has come up with a plan that does not destroy the natural beauty of our land.

I would like to thank and applaud the County employees who worked on this project for their careful understanding of the environment.

Very truly yours,

COLLIERS PARRISH INTERNATIONAL, INC.

André R. Walewski
Senior Vice President
408-236-3124

ARW:mag

Q. Response to Colliers Parish International

1. Comments noted. No response required.

R

FORST

COMMERCIAL REAL ESTATE

May 2, 1996

To: Planning Commission
Santa Clara County

Re: 4039-67-28-93DEIR
Lion's Gate Reserve

I am a 20 year resident of San Martin and a 9 year member of the San Martin Planning Advisory Committee. I have thoroughly read the DEIR and am satisfied with the mitigation measures. I do have two points to which I directed my attention:

1) Conversion of agricultural land.

1 The Am zoned portion is currently non-producing. If activated to producing, it would impact water usage and the groundwater. Clustering of homes on the proposed zone change to H is a better treatment because it removes the possibility of higher density at a later time and it leaves the remaining area for recreation and permanent open space.

2) Flooding.

2 The west San Martin area is susceptible to flooding. The creation of a lake (aesthetically pleasing) and the other mitigation measures will alleviate the current situation.

At the April 10 meeting of the San Martin Planning Advisory Committee the members were polled and, although comments were made, the Committee voiced unanimous support for the project.

The developer is extremely sensitive to the environmental issues and has diffused any of my concerns of any negative impact. To the contrary, I feel this project is a positive addition to the rural character of San Martin. I urge your support of this quality development that is proposed in San Martin.

Respectfully submitted,

Pat A. Forst

1190 So. Bascom Avenue. #129 • San Jose, CA 95128 • (408) 279-2664

R. Response to Forst Commercial Real Estate

1. Comment noted. No response required.

2. Comment noted. No response required.

S

April 16, 1996

Juanell Waldo
County of Santa Clara
Environmental Planning Dept.
70 West Hedding St. 7th floor
San Jose, CA 95110

Reference EIR Lion's Gate Reserve and Golf Course

Dear Ms. Waldo:

It was interesting for me to read the entire Draft EIR for the property described above. As a long term resident of Santa Clara County, owner of property in the area, golfer, and environmentally sensitive citizen, it was gratifying to read such a well thought out and thorough report. It seems that the applicant has spend considerable time and effort in trying to satisfy the need and requirements of all the parties concerned.

1

Golf is becoming such a popular sport that it is almost impossible to find a tee time in the county. The need for courses is apparent. However, the amount of land required, coupled with the multitude of issues to solve in building a course is a difficult task. It appears that the developer Hix-Rubenstein have done there homework and the project deserves our support.

Please put me down as an avid supporter of this project.

Sincerely,

William P. Moison

MOISON
INVESTMENT
COMPANY

RECEIVED
PLANNING OFFICE
96 APR 22 PM 4:17

350 2nd Street
Suite 7
Los Altos, California 94022

S. Response to Moison Investment Company

1. Comments noted. No response required.

T

ATTENTION: Ms. Jaunell Waldo, Environmental Planning

To Santa Clara County Planning Commission

From Twin Valley Water
14295 Sycamore Drive
Morgan Hill, CA 95037

RE: Lion Gate Reserve EIP and Geoconsultant Report

1 Twin Valley Water was listed in the above Report as a provider of Water for the Lion Gate Reserve Golf Course. Twin Valley was listed as providing only 14000 gallons per day. This letter is to inform the Commission that Twin Valley has developed two new wells and can now provide Lion Gate Reserve up to 120,000 gallons per day.

2 With the two new wells which are below 4 ppm of nitrates, the two old wells can be dedicated to the Lion Gate Reserve project. This will be a good use of the old wells and the water they supply. Especially since the old wells have a nitrate level above the 45 ppm as government regulations. The Twin Valley main water pipes run along the Watsonville Road area just next to the Lion Gate Reserve.

I feel Twin Valley will provide at least 120,000 gpd of water for the golf course. If you have any questions please call at 408-229-6473.

Sincerely

Steve Havens
Twin Valley, Inc.
President

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PLANNING OFFICE
96 MAY -3 PM 4:09

T. Response to Twin Valley, Inc.

1. The preliminary water supply study by Geoconsultants, Inc., contained in Appendix M of the DEIR, estimated that the safe yield remaining after Twin Valley fulfills its obligations to its existing customers is 14,000 gallons per day. It should be noted that this estimate is very conservative and is based on rainfall conditions, and takes into consideration the general physical characteristics of the groundwater basin. It is possible that a detailed field investigation of the Twin Valley aquifer would indicate that the safe yield is actually greater than estimated in the preliminary study.

2. Comment noted. No response required.

U

John Ambrose
Chris Ambrose
625 Highland Avenue
San Martin, Ca 95046
April 24, 1996

Planning Commission
c/o Juanell Waldo
County Government Center
E. Wing 70 West Hedding Street
San Jose, Ca 95110

Dear Juanell,

We live on Highland Avenue and we are opposed to massive development in the hills and foothills of San Martin, such as proposed by the Lion's Gate developers. We oppose the development for at least four valid reasons. The EIR(environmental impact report) understates problems with flooding, insurance, water supplies available, and future increases in traffic. The EIR omits any discussion of mortgage insurance problems in an expanding flood zone as determined by FEMA and other government agencies. The report ignores existing county recommendations for not building in flood zones near rivers or creeks.

1 During the last two winters the Highland Creek and the west branch of Llagas Creek overflowed and once the overflow flooded our barn and part of our backyard past the back of the house on 625 Highland. We were notified our home needed flood insurance six months after moving to Highland Avenue in June 1993, costing an additional $1,276.00 per year to the mortgage insurance. The current EIR does not note that the FEMA flood zone will soon increase in size after recent floods and formation of "Lake Highland" near Harding and Highland in the wintertime. This flooding occurred with less than the maximum of 44 inches of rainfall/year in recent memory. Our insurance will certainly go up! Please see the enclosed flood map of 1988. The homes in the area can't tolerate more runoff. Even with the current runoff ditches and small streams flooding occurs, development of land in the area will create a situation for more runoff because the rain will not be absorbed by the ground. The current ditches must be maintained by the water district, although this has not happened in our area.

U. Response to John and Chris Ambrose

1. The drainage and flooding study prepared by Schaaf & Wheeler for the DEIR is based on the updated flood map prepared in 1991, which has not yet been published by FEMA and is only available in draft form. As discussed in the DEIR at Section *III. E. Hydrology and Drainage,* the Lion's Gate project includes sufficient retention basin capacity such that the peak flows from the site during major storm events would be reduced compared to present conditions.

   With respect to the flood insurance question, CEQA requires only that EIRs address the potential physical impacts of proposed projects. Therefore, the analysis of social or economic issues, including insurance matters, is not within the scope of review required for the EIR.

2
3 We are all aware of the droughts of the late 1980's in this county with water rationing and dry wells. The EIR fails to show where the surplus water will come from in a drought, nor discuss land sinking with over pumping of ground water.

4 Since the municipal court, police, and VMC buildings were constructed recently at the Highland and Monterey Highway intersection there has been more foot traffic without sidewalks plus auto traffic has increased on our narrow road without shoulders. A truck recently crashed into my walnut trees in front of my house and the Highland-Santa Teresa intersection is already much too busy with out further development. The local quite community and our family fear next will come traffic lights, more accidents, and congestion with the Santa Teresa commute traffic increasing.

5 Aside from direct questions about the EIR, we are not aware of any petition by golfers in the area to force upon us another golf course out of "necessity". There are a number of good golf courses form Almaden to Ridgemark, which are usually busy on weekends and holidays. The contractor, Hix, has not convinced us of a need
6 at this time. If any thing is needed in San Martin it is more horse trails in the mountains instead of houses. Perhaps the county could create a park instead of an exclusive club for increasing the tax base. This may be an area that could be purchased by the Open Space Authority of the county for the use of all residents.

Sincerely,

John Ambrose

John Ambrose M.D.

Chris Ambrose

BIOLOGIST

Chris A Ambrose Ambrose

accountant

2. On-site groundwater resources are not sufficient to meet the irrigation needs of the golf course, except possibly after very wet winters. Thus supplemental water supply would be obtained from off-site sources, principally West San Martin Water Works. This water company draws from 400-foot deep wells in central San Martin, and no difficulties whatsoever were experienced by the water company during the last drought. During the height of the drought, water levels in the Llagas aquifer dropped only to 112 feet below the ground surface, far above the level of the water company's pumps. (The Santa Clara Valley Water District, in a memo dated June 26, 1996, has indicated it concurrence that there is sufficient water available for the project. This memo has been added to the EIR and is included in Section *VI. REVISIONS TO THE APPENDICES OF THE EIR.)*

   The pumping of on-site groundwater at the Lion's Gate site would vary from year to year depending on the amount of recharge received from the previous winter's rainfall. Water withdrawals would be carefully monitored to ensure that the safe yield for any given year is not exceeded, and to determine when to suspend on-site pumping and switch to off-site sources of supply. (See Section *II. OVERVIEW OF MAIN ISSUES DISCUSSED IN COMMENTS ON DEIR.)*

3. With regard to potential land sinking or subsidence, this effect would be prevented by not withdrawing groundwater beyond the specified safe yield for the on-site aquifer. As noted in DEIR Section *III. D. GEOLOGY AND SOILS* at page 84, since the sediments underlying the Lion's Gate site are moderately to well consolidated, minimal subsidence or settlement is anticipated to result from moderate irrigation pumping.

4. The intersection of Monterey/Highland is controlled by a traffic signal and has been shown to operate under minor traffic delays during peak hours (Level of Service A or B). Added traffic from approved projects and the proposed project would not significantly change this condition. The peak hour conditions would still function at LOS B which is deemed to be acceptable by County standards.

5. There is no requirement in CEQA that project proponents demonstrate the "necessity" or "need" for their project.

6. As noted in the DEIR, the project includes the dedication of an easement for a shared use trail along the northern site boundary.

V

Ernie Dercto
12605 Harding Ave
San Martin, Ca. 95037

Ms Jeanne Waldo
Advance Planning Office
County Government Center, East Wing
70 West Hedding Street
San Jose, Ca 95110

Subject: Notice of preparation for Lion's Gate Project, Santa Clara County, California (SCL number 4039-87-28-93)

Dear Ms. Waldo:

I attended a meeting in San Martin of the proposed Lion's Gate Project planned for Hayes Valley on the South side of Watsonville Road between Morgan Hill and Gilroy. After reviewing the proposal, the 3 serious issues that were not completely addressed were land use, water shed, and impact of development on rural surrounding areas.

1.)Land use: Ag20 was assigned because it complied with the moratorium passed in __-__-1974 which required land to be sub-divided into 20 acre parcels allowing each ranch owner/buyer to provide their own sewer system, water and utilities on an individual basis rather than having a third party management/association. Associations do well early in the project, but when the residence who live there find that Not all of the funds are going where they should, it is usually too late because by then the project is sold to another Association that tries in vain to balance the budget. As a result, the project begins to show signs of neglect and carelessness which can have an impact on the surrounding areas.

2.)Water Shed: As the San Martin Council member stated, 'During a drought year, San Martin Water Shed cannot provide the water capacity required by the project and still insure surrounding/neighboring wells from going dry'.

A) During a drought year farmers have the most to lose, but even local home owners pay more because it takes more electricity to pump up a smaller volume of

V. Response to Ernie Donato

1. The package wastewater treatment plant would not be operated by the homeowners association, but by a Community Service District. CSDs are special districts provided for under state law and created by the County of Santa Clara Local Agency Formation Commission (LAFCO). Therefore, the CSD for the project would exist as a separate entity with its own governing board not subject to the control of the golf course operator or homeowners association. Since the CSD would be funded through a special assessment included in the property tax bills, the proper maintenance and operation of the treatment plant would be assured over time.

2. As discussed in the DEIR, West San Martin Water Works would provide supplemental irrigation water supply for the golf course. During the recent drought, the water company experienced no water shortages or other drought-related difficulties. Naturally, the groundwater levels declined in response to lower than normal annual recharge, as would be expected. It should be noted that for the Lion's Gate project, monitoring wells would be located on-site, which together with existing off-site wells would be constantly monitored to ensure that groundwater pumping at the site is suspended before the safe yield for the aquifer is reached in any given year.

water. the only ones who do well in a drought are companies like Chappel pump & Supply and Azeveco Well Drilling.

3 B) During a drought year their is not enough natural run off to sustain a 20 acre lake. but if we allow this lake to go in, San Martin Water Works could be held liable for maintaining a minimum water level to keep endanger wildlife that become residence their from becoming extinct.

4 C) Some of the latest Golf maintenance equipment includes a golf ball washer that uses Krytonite ball cleaner. it claims to be biodegradable and non-toxic. but I did not actually read the label. Can anyone verify their claim? it is made by Range Land USA, 2331 south Seventh St. San Jose, Ca. 95112. there is also a ball socker with conveyor attached that moves 3000 balls per minute into the ball washer. Don't know what is used in ball socker. My question is: if the project does intend to use this type of equipment, where will the used cleaning solutions be dumped?

5 1.) Impact on Surrounding Areas: Many neighbors are already taxed beyond ability to pay.

6 If this project goes througnout, it will increase land value and result in higher taxes for the over all community. The community is already seeing nigh nitrate levels in the water, and we cannot afford another risk to our water supply.

Sincerely, Ernie Donato april 21,1996

Ernie Donato

3. The proposed 20-acre lake to be located in the residential area near Turlock Avenue would be naturally fed by groundwater and would not be lined. Therefore, water levels in the lake would be expected to fluctuate seasonally and from year to year depending on rainfall amounts.

4. The ball washers would contain water with a very small solution of common dishwashing liquid. The detergent selected would not contain phosphates and would be biodegradable. The small amount of solution involved could be periodically discharged directly onto the turf with no significant water quality impacts.

5. Under Proposition 13, property tax increases are limited to no more than 2 percent annually. Therefore, external factors would have no impact on property tax rates for existing owners.

6. As discussed on page 198 of the DEIR, the nitrate levels would not increase as a result of the project. The new sources of potential nitrate loading represented by the wastewater treatment system and golf course fertilizers would be offset by the removal of cattle grazing from the site.

W

Lion's Gate Reserve (Hayes Valley) Golf Course

Below are my comments on the Draft Environmental Impact Report for this project. (Note: Your opinions on the merits of the project should be sent directly to the Planning Commission prior to the approval hearing.)

1) The number of stream crossings (13?) should be reduced to minimize impacts on the riparian corridor consistent with the County's Golf Course Guidelines.

2) Require a permanent conservation easement over the golf course

3) The 20,000 sq. ft. equestrian facility combined with the outdoor horse ring and ancillary facilities should be scaled down to reduce runoff downslope + potential flooding onto Tarlock Ave.

4) Structures for private use - Clubhouse, tennis, swim, equestrian & should not be counted as open space by the County's own dedication requirements

Please provide the following information so we can provide you with a response to your comments. Please print clearly.

Name Timothy Duff

Address 960 Alice Lane #3
Menlo Park, CA 94025

Written comments can be sent to Jaunell Waldo at the County Planning Office, 70 W. Hedding Street, San Jose, CA 95110 until **May 3, 1996.**

5) Equestrian Center should require a separate use permit.

W. Response to Timothy Duff

1. The total number of stream crossings in the development plan has been reduced from 16 to 11 crossings.

2. The question of whether an easement would be required over the golf course is a policy question to be addressed by the County decision-makers, and is outside the scope of the EIR.

3. As discussed on pages 24 and 103 of the DEIR, drainage through the equestrian area would be reduced as much as feasible by routing drainage originating up-slope around the equestrian center to the proposed lake. This would offset the minor increase in runoff resulting from the impervious surfaces of the equestrian center.

4. The clubhouse and the swim and tennis center lie within the golf course site and are not included in the acreage calculation for the permanent open space area. The equestrian center is located within the open space area, as provided for in the cluster ordinance which allows such areas to be used for recreational facilities for the project's residents. The equestrian center is proposed to house residents' horses, instead of having individual horse stables on each lot, as permitted in the HS zone. It should also be noted that the permanent open space area contains 282 more acres than is required to make up 90 percent of the total hillside-zoned area.

5. As part of the cluster development, the equestrian center would be included in the cluster permit for the hillside cluster residential area.

X

1005 Highland Ave
San Martin, Ca. 95046
April 16, 1996

Jaundell Waldo
Env. Planning Dept.
San Jose, Ca. 95110

Re: E. & R. Lions Gate Preserve

Dear Ms. Waldo,

Last Tuesday evening in Morgan Hill we had the opportunity to meet with approximately one hundred citizens to listen to Tom Kipp present the "Lions Gate Preserve" Project.

1 For forty minutes with overhead screen and large architectural drawings, Mr. Kipp carefully presented every aspect of the project, which was followed by a tremendous

X. Response to Lyle and Esther Hughes

1. Comments noted. No response required.

round of appreciative applause.

We were all given a draft of the "Environmental Impact Report" also, a copy of Lion's Gate Reserve Project," which we have carefully studied and appraised.

It was gratifying to witness that every aspect of concern environmentally had been addressed minutely, adequately and satisfactorily. In fact
2 here is a project in which we can have justifiable pride, one that can be a superb model for many years to come.

We are landowners adjacent to this project and are excited about what is going to happen. This project has our enthusiastic and full support.

Respectfully, Esther Hughes

2. Comments noted. No response required.

Y

Responses and questions by Doug Marlitt regarding: 4/26/96

Draft Environmental Impact Report -- Lion's Gate Reserve
Volume III, Appendix M - Water Supply Reports and Documentation
Volume I, Section P

Ref: 1. Geoconsultants, Inc.
San Jose
Project # G1022-01
John Hofer April 6, 1995

2. West San Martin Water Works
1005 Highland
San Martin
Bob Ukestad Nov 30, 1995

3.Geoconsultants, Inc.
San Jose
Project # G1022-01A
John Hofer Feb 20, 1996

WATER SUPPLY

1.Geoconsultants' reports mention "preliminary" or "very preliminary" 13 times. Geoconsultants 4/6/95 report states well location studies and aquifer testing was outside the scope of the Hayes Valley on-site report and offers its services to perform a "detailed basin water balance study to more accurately determine safe yield figures, or on-site studies for water well location." Geoconsultants 2/20/96 report states "It should be noted these figures are preliminary in nature. In order to assure that the projected supplies are realistic, a detailed aquifer analysis will need to be performed at the Lion's Gate Reserve. In addition, it may be necessary to perform further studies in the West San Martin and Twin Valley areas." (Aquifer tests include drawdown data from observation wells and on-site specific hydraulic characteristics.)

1 2 3 ***When will the on-site aquifer and well studies be completed? Because the site will be very dependent upon on-site water availability for irrigation, should project approval be delayed until water availability is established empirically? What will be the affect on neighboring wells on the same aquifer (or very close to it) when irrigation begins?***

2. In Section IIID, Geology and Soils, impact #10 states: "As discussed in section IIIp, Water Supply, on-site wells would be used to augment irrigation water supplies from Twin Valley, Inc. However, on-site pumping would not exceed the estimated safe yield of

Y. Response to Doug Marlitt

1. The best time for conducting the study of hydrogeologic characteristics is in the late summer or early fall when the groundwater table has reached static conditions. Any investigations conducted earlier in the year would be still influenced by the previous winter's rainfall.

2. There is no doubt on the part of Geoconsultants that more than sufficient water supplies are available to serve the project from on-site groundwater, in combination with supplemental supplies from West San Martin Water Works and Twin Valley, Inc. (The Santa Clara Valley Water District, in a memo dated June 26, 1996, has indicated it concurrence that there is sufficient water available for the project. This memo has been added to the EIR and is included in Section *VI. REVISIONS TO THE APPENDICES OF THE EIR.)* However, additional studies are required to define the characteristics of the aquifer, for purposes of determining the optimum location(s) of production of well(s), and to establish setback distances for these new well(s) to ensure that they do not have an impact on off-site wells.

3. There is no doubt on the part of Geoconsultants that there is sufficient area available on the site such that the required production well(s) can be placed in locations where they will not result in off-site impacts. (See Response #5 below.)

280K gpd based on an average daily used, therefore, the on-site water table is not expected to be lowered as a result of supplemental irrigation pumping at the site".

4 5 ***Hayes Valley is the prime irrigation source augmented by Twin Valley's minuscule 14K GPD -- Hayes Valley is not a supplemental source. What measures will be taken to ensure no overpumping during drought years when lower rainfall cannot be expected to replenish the aquifer?***

3. Hayes Valley's aquifer recharges from rain only -- there is no groundwater inflow. The recharge rate of 470ac-ft/yr is calculated from a 25-year old report. Twin Valley on-site recharge is only from rain, also. We have had two droughts in the past 20 years. Section III P, "Water Supply", overlooked that the development will require twice the water in its 6 first year as was mentioned on page 30 in the project description. This fact was not mentioned in the Geoconsultants, Inc. reports, either. All figures are based on average usage's. Peak demands go unaddressed -- in the first year, irrigation needs would demand 300% of the on-site availability during a six-month period; 54% every year thereafter. The Geology and Soils section says "....minimal subsidence, or settlement, is not anticipated to result from moderate irrigation pumping". The additional 300% the first year and 54% every year after is not "moderate". The first year alone will pull 15% from the aquifer (if full) over and above the annual recharge rate.

7 8 9 10 ***Is there data more recent than 25 years old regarding rainfall? Should the safe yield figure be recalculated to be realistic? What measures will be taken to prevent overpumping in drought years when the aquifer recharge rate is inadequate? What thresholds will be established to prevent misuse of the aquifer supply and its possible affect upon subsidence and neighboring wells? How can peak demand during the six, or so, dry months be mitigated by using averages?***

4. Page 184 - on-site groundwater states: " There are 4 agricultural wells on the site which were previously used for irrigation supply, but are no longer in use." They aren't mentioned in Geoconsultants, Inc. reports

11 ***Why are these wells unused? No demand for them or are they dry? Has the water supply ever been inadequate for them?***

5. On-site well(s) locations or depths are not defined. Geoconsultants states there would be impact to off-site wells if on-site wells are placed too close to eastern down-gradient wells. Section P states: "The precise location of the on-site irrigation well (sic) would be determined prior to project development, based on primary locational criterion of resulting in no down-gradient impacts."

12 ***Who determines well location and when? Who approves this? What about northeastern down-gradient wells? What is a "prudent distance"? Where are the required professional studies that are not preliminary?***

4. The referenced statement has been revised to reflect the fact that the Hayes Valley aquifer is the primary source of irrigation water. (See Section *V. TEXT AMENDMENTS.)*

5. A downgradient monitoring well on the site would be monitored constantly during pumping operations to observe any drawdown in the water table, which would provide an indicator of when to suspend on-site pumping and begin drawing exclusively from supplemental sources. In addition, existing off-site wells would also be monitored to ensure that impacts are not occurring.

6. The referenced discussion on page 30 of the DEIR states that water applications would be approximately double normal irrigation rates during the 6-month grow-in period, which was a very conservative estimate. This discussion has been revised based on the experience of the Silver Creek Valley Country Club, which has conditions very comparable to the Lion's Gate site. At Silver Creek, the grow-in period lasted 1.5 to 2 months, with water consumption rates only a small percentage higher than during subsequent years. The total water consumption during the first year was 140 million gallons over 120 irrigated acres, versus 130 million gallons for subsequent years. The estimated average annual irrigation water consumption for the Lion's Gate golf course is 122 million gallons over 97 irrigated acres. It is also important to note that grow-in occurs either in the spring or fall; the summer period is avoided to prevent burning the seeds, and winter is avoided to prevent the risk of washouts during heavy rains. (See Section *V. TEXT AMENDMENTS.)*

7. The rainfall information cited from Rantz (1971) consisted of an isohyetat (rainfall control) map of the greater Bay Area. The precipitation values were based on specific gauges throughout the area, and represent average rainfall for the 50-year period between 1906 and 1956. Although this study has not been updated since then, the gauges have continued to monitor rainfall. There is no precipitation gauge presently installed at the site; however, a gauge in Gilroy has determined average annual rainfall to be 20 inches for the period of 1957 through 1994. Rantz's isohyetal map showed rainfall at Gilroy to also be 20 inches for the period from 1906 to 1956. Therefore, due to the proximity of Gilroy to the site, it can be assumed that the annual rainfall for Hayes Valley has also continued to be the same as indicated in the preliminary groundwater study (at 21 inches).

8. The principal means of preventing overdrafting during drought years would be the suspension of on-site pumping when the monitoring wells indicate the approach of unacceptable drawdown levels. Under severe drought conditions, it is reasonable to assume that little or no water would be available from on-site groundwater or Twin Valley, Inc. Thus all of the irrigation water supply for the project would have to be supplied by West San Martin Water Works. According to the Geoconsultants report of February 20, 1996 (contained in Appendix M of the DEIR), WSMWW has more than sufficient surplus safe yield to provide for all of the project's irrigation requirements.

   The water company draws from three 400-foot deep wells in central San Martin, and no difficulties whatsoever were experienced by the water company during the last drought, so no rationing program had to be implemented. During the height of the drought, water levels in the Llagas groundwater basin dropped only to 112 feet below the ground surface in the vicinity of the wells, which is far above the level of the water company's pumps at 400 feet below the ground surface. It is also worth noting that the overall water demand in the West San Martin service area has actually declined over the years with the reduction in agricultural irrigation.

   In the event of a prolonged drought, a drought contingency plan would be instituted at the golf course to reduce irrigation water demand. As discussed on page 189 of the DEIR, water usage at the golf course would be cut back in phases. As a drought develops and/or water supplies diminish, irrigation applications would first be reduced in less critical areas such as fairways. As conditions worsen, irrigation of fairways

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would be further reduced or suspended altogether, depending on the severity of the drought. During this time, irrigation would also be reduced on higher priority areas such as tees and fairway landing areas, to a level which would still maintain plant life, but at a severely stressed level. The greens would be the last to have reduced irrigation because they include the most critical turfgrass, and because they make up only about 4 percent of the total irrigated acreage.

9. As the operation continues over the years, the project geohydrologist would maintain a record of rainfall and well pumping in relation to water table drawdown. This would enable a better understanding of aquifer characteristics and capacities that would in turn provide a basis for predicting available groundwater for a given year based on the previous winter's rainfall. The golf course would include a weather station and rain gauge, which would allow for calculations based on known rainfall amounts at the site.

10. As discussed in Response #5 above, once on-site groundwater levels begin to approach unacceptable levels, on-site pumping would be suspended and off-site sources such as West San Martin Water Works would be relied upon exclusively for irrigation supply.

11. The on-site agricultural wells are not currently used because there is currently no demand for non-potable water at the site. There is no well history available on these agricultural wells.

12. In response to these concerns, Geonconsultants prepared the following summary of the geohydrologic studies that would be conducted to provide the detailed information required.

> Initially a 24-hour aquifer test will be performed on one of the existing wells on the property. Static water levels will be measured in the pumping well as well as a monitoring network of at least one on-site well and one off-site well (i.e., existing wells on neighboring properties). Drawdown and recovery levels will be recorded in all wells during the pumping test. Based on the results of the aquifer test, calculations of transmissivity, specific capacity, and storitivity will be prepared. This information will enable the geohydrologist to make a determination as to the maximum radius of pumping influence (see diagram on page 4). Once this has been established, a setback line can be drawn so that new on-site production wells will not have an impact upon existing off-site wells.
>
> Once the setback line has been established, an on-site survey for the purpose of locating one or more on-site production wells will be performed. Based on the results of this survey, one or more production wells would be constructed, and the water-bearing characteristics of the formations evaluated.
>
> A 72-hour pumping test to determine well production parameters such as specific capacity and recommended pumping rates will be performed following construction. At the conclusion of the test, a water sample will be collected for an evaluation of constituents in accordance with State and County drinking water standards.
>
> A monitoring well network will be developed including the production well(s), other on-site wells and appropriate off-site wells (i.e., existing wells on neighboring properties). In order to develop a water level history, measurements will be taken in each of the wells for an extended period of time. Individual well hydrographs will be developed. In addition, a precipitation gauge will be installed at the site in order to develop accurate rainfall totals. This information will allow periodic updates of the aquifer characteristics, and assure that an overdraft condition would not occur.

7. Geoconsultants' report states average domestic usage will be 150K GPD -- Section P states 114K GPD.

13 ***Which is correct?***

8. WSMWW storage capability with the new tank will be 450K gallons -- a single day's peak usage. Current storage is 150K -- 34% of peak usage.

14 ***When is WSMWW's new storage tank going to be completed?***

9. Mitigation 1b in section P quotes the Geoconsultant report in appendix M to say "...the pumping of on-site groundwater *would* not result in impacts to wells immediately down-gradient to the east...." Geoconsultants, Inc. says *should.*

15 ***There is difference between "would" and "should". "Would" implies a definite conclusion, "should" implies an educated guess. Will there be impact, or not?***

TRAFFIC

The traffic generated by this development, in and of itself, may not appear to have significant affect, but the EIR does not address the increasing traffic along the Santa-Teresa/Coolidge north-south route through San Martin by West Gilroy residents. There is absolutely no traffic control between First Street in Gilroy and Watsonville Road in Morgan Hill. Following the building of the new wide straight road between Day Road and Highland which bypassed the Turlock dogleg, traffic volume and speed have increased dramatically. The stop sign suggested for Turlock affects only a dozen, or so, residents on Turlock who will now have to stop for Hayes Valley traffic.

16 ***I believe the EIR understates the overall inevitable congestion and safety hazards at adjacent roads. There should be traffic control on Coolidge/Santa Teresa where it intersects with Highland.***

FLOODING

17 FEMA is revising its Flood Insurance Rate Map for San Martin. Quoting, "the proposed 100 year flood plain for West Branch Llagas Creek near Highland Ave. is significantly larger on the revised maps than on current maps".

There will be a 33% increase in upstream runoff from the development. Turlock, Coolidge and Highland avenues already flood, without the addition of upstream development. Regardless of mitigating lakes and ponds, the additional flood water the development will cause will still have to go somewhere when those lakes and ponds fill up. The EIR mentions a waiting period of 24 hours after a storm before allowing held flood

13. The estimated average daily demand for potable water at the project is estimated to be 114,000 gallons. The figure of 150,000 reflects the volume of water which West San Martin Water Works has committed to providing per their letter which is included in Appendix M of the DEIR. However, WSMWW has indicated in a letter dated June 7, 1996, that it could provide more water if needed. As mentioned above, the Santa Clara Valley Water District concurs with this, as discussed in their memo of June 26, 1996. The WSMWW letter and the SCVWD memo have been added to Appendix M of the EIR. (See Section *VI. REVISIONS TO THE APPENDICES OF THE EIR.)*

14. Bob Ukestad, the General Manager of West San Martin Water Works, indicates that the water tank will be complete and operational by mid-1998, the projected date for completion the Lion's Gate golf course. (See June 7 letter noted above.)

15. As discussed in the responses above, the well-monitoring program will ensure that on-site pumping will be suspended when the groundwater table approaches unacceptable levels.

16. The traffic study was completed in April 1995 and included all the projects in the cities of Gilroy, Morgan Hill and unincorporated Santa Clara County approved up to that date. Since the release of that study, a new development in Gilroy (Deer Park/Rancho Hills) was approved that included 294 units. However, it is expected that only minor traffic will be added to the project area from this development which lies several miles to the south.

    It is acknowledged that as traffic growth does occur in San Martin, the traffic controls at local intersections may need to be upgraded even though no such improvements are recommended to serve this project. The forecasted peak-hour volumes at Highland/Santa Teresa (the project entrance) are well below the level needed to warrant All-Way STOP controls. The existing 2-way STOP controls would be adequate. However, the County, at its discretion, may elect to place an All-Way STOP control at the Highland/Santa Teresa intersection to control the known speeding problem on Santa Teresa Boulevard. The Santa Clara County Roads Department is responsible for evaluating the need for All-Way STOP or traffic signals on major streets in the county. These evaluations follow standard technical guidelines which judge vehicle speeds, volumes and accident histories.

17. The flooding study prepared by Schaaf & Wheeler for the DEIR is based on the updated flood map prepared in 1991, which has not yet been published by FEMA and is only available in draft form.

waters to drain into the West Branch Llagas Creek so the holding ponds can take on more water. Once the holding ponds are full, storms will not conveniently stop every 24 hours. As a resident, I also know the West Branch Llagas Creek doesn't subside that quickly -- it's several days, if not weeks, after a storm before it subsides. The proposed mitigation for handling the additional runoff from this development will only be effective when storms are evenly spaced enough to allow lowering the holding ponds' flood levels.

18 ***When storm periodicity precludes the emptying of excess water from the holding ponds, where will this water from the holding ponds go when they overflow?***

One quarter of Lion's Gate's homes will be built in flood zones. The diverted water from new homes planned north of the creek has to go somewhere. This fact was overlooked in the EIR. This water will be diverted north, guided by a proposed berm along Coolidge to flood lower neighboring properties. Flood waters already occurring in this area currently break over Coolidge avenue between Powder Horn Court and Steven's Court to find its normal route.

The County Drainage Manual issues guidelines to ensure there are no off-site drainage problems associated with a project.

19 ***The EIR understates the development's impact to neighboring San Martin residents and does not completely mitigate off-site drainage impact to existing neighbors, north or east.***

Thank you for this opportunity to comment.

Doug Marlitt
12845 Coolidge Ave.
San Martin, Ca. 95046

D - 434-0601 x3408
E - 683-4046

18. The outfall from the lake into West Branch Llagas Creek would be designed so that no flows from the lake could enter the creek until the flows in creek have receded. In the event that the lake completely fills up with flood water from the site, the pond would be designed to permit overflows toward Turlock Avenue, as would occur under current conditions. However, the volume of these flows would be lower than under current conditions, since much of the flood water would remain stored in the lake.

19. Comment noted. The berm along Coolidge Avenue would be designed with sufficient breaks such that the direction of sheet flows during major storm events would not be altered relative to existing conditions. The EIR has been revised to clarify this point. (See Section *V. TEXT AMENDMENTS.)*

It is important to note that the project would not be responsible for mitigating drainage and flooding that would occur under existing conditions, but rather to avoid or mitigate any increase in flood hazard resulting from the project.

Z

The Meadows

4/25/96

Santa Clara County Planning Commission
70 West Hedding St
San Jose, CA 95112

Re: Hayes Valley/Lion's Gate Proposal - EIR

Dear Commissioners,

This letter is to address concerns surrounding the proposal. I represent a 16 home subdivision figuratively and literally downstream from Hayes Valley. My immediate concerns would involve downstream flooding and traffic. I have read the DEIR and have the following comments:

Downstream Flooding

The Meadows borders the West Branch of the Llagas Creek which is the drainage channel for the Hayes Valley project. The San Martin/North Gilroy area has been subject to repeated sheet flooding occurrences that have closed Fitzgerald and Day Roads repeatedly as well as some structure inundation. The PL 566 project has been completed to Day Road and it is obvious that there is no money from SCVWD, SCS, the County, or the State, to extend the project. Many of us in the area have sought some action to protect the lands in the area. I am very pleased to see that this project will result in an **improvement** of the local flood situation due to the creation of several onsite detention facilities. Please look favorably on any such structures that improve the hydrology of the area and consider the long range benefits to the area wide drainage problems when considering the expansion (if proposed) of such detention facilities. The DEIR did not address the fact that this onsite detention would also create wildlife habitat. From personal experience I can say that this too would be a positive environmental impact.

1

Traffic

The Meadows is again downstream of the traffic impacts of the project. Upon review of the DEIR I am assured the impacts are less than significant. Upon reflection I realize that golfers are given starting times that are separated by 7-12 minutes and the maximum

R. Jeffrey Martin • Broker
101 Green Valley Drive • Gilroy
(408) 848-1151

Z. Response to Jeffrey Martin

1. Comment noted. No response required.

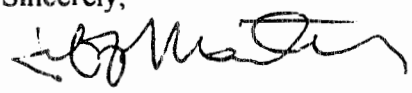
group size is four people. This metering of golfing would be paralleled in the traffic pattern created by the golfing component. I would expect to see cars coming and going at the rate of about 2-4 cars every 10 minutes. Therefore, as a neighbor, I feel that the project impact is minimal. Also it seems that the traffic patterns would be reversed from the existing local traffic. This too would reduce the impact.

2

While all aspects of the project are important these two areas caused me the most concern. In light of the extensive studies made in connection with the DEIR I think that this development would be an asset to the San Martin community.

Please feel free to call if there are any questions concerning this letter.

Sincerely,



Jeff Martin
848-1151

cc: Jaunell Waldo

2. Comment noted. No response required.

Z1

May 1, 1996

Jaunell Waldo
County Planning Office
70 W. Hedding Street
San Jose, CA 95110

Re: Lion's Gate Reserve (Hayes Valley) Golf Course

Dear Jaunell,

My husband and I are building a home on a parcel off Watsonville Road that will have a shared fence line with the above development. We did attend the planning meeting that was held in San Martin, and I have recently had a phone conversation with Tom Hix. We have the following concerns regarding the Draft Environmental Impact Report:

• The entrance off Watsonville road is designated to be *minimal* usage. Per my conversation with Mr. Hix, *minimal* usage means a supply truck once a week and five to six employees per day coming in the morning and leaving in the afternoon. This sounds reasonable to us. Our concern is that the actual usage not exceed these parameters and that there will not be heavy duty trucks coming and going, ten to twenty employees a day, or golfers exiting onto Watsonville road. Mr. Hix indicated that there will be a gate on the Watsonville road side, but we are not sure how he will keep golfers and others leaving the golf course from exiting out this way. We would appreciate this being addressed and stated in the EIR to avoid any problems or confusion further down the line.

1

• Noise travels extremely well in the Hayes Valley area. For example, if you are standing on our property you can hear a conversation taking place at the ranch across the street. We are concerned about parties and events at the clubhouse/hotel and the possibility of hearing amplified music at our home. We would like to see a requirement enforced and stated in the EIR that prohibits amplified music from being played outside the clubhouse/hotel or on the golf course grounds. Recently we know that the Los Altos Hills Country Club golf course has upset many neighbors by holding parties outside the clubhouse and on the golf course grounds. Even though the homes are closer in the LAH Country Club area, the impact will be the same because of the extreme and concentrated way noise travels

2

Z1. Response to Shelley E. Moeller

1. Since there would be no through-connection between the clubhouse area and Watsonville Road, it would be physically impossible for golfers and others to enter or exit via Watsonville Road.

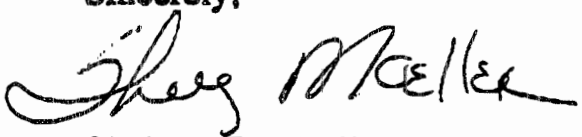
2. The home referred to in this letter would be approximately 8,000 feet away from the proposed clubhouse. Noise attenuation over this distance would be significant. It was calculated by Illingworth & Rodkin that if loud music were played inside the clubhouse even with the windows open, noise levels would be inaudible under all conditions on this property. If a band were playing at high rock concert levels outdoors, it would be possible that the sound would be noticeable at this home. Typical party band noise levels might also be audible but they would not be significant. Even under worst-case atmospheric conditions, noise levels would not exceed County limits.

through the interior Hayes Valley area.

3 • The public trail is a great idea and I know our family will enjoy it. However, we strongly suggest making it strictly a walking/jogging and equestrian trail. You are asking for trouble if you let bicyclists also use this trail. The combination of bicycles and horses is deadly. Bicyclists have a tendency to go very fast and sometimes do not see the person or horse around the bend. Furthermore, most horses will spook at bicycles, and there is a strong chance that the bicyclist or the horseback rider could get seriously hurt. There is a park in Woodside (Huddart) that considered letting bikes on a few of the trails, but the county voted it down for these reasons and many others. Besides, there are many horse owners in this area and horses complement the flavor and environment of the valley.

Thank you for considering our comments and concerns before you approve the EIR report for this project. Before moving to Morgan Hill, we lived by a well known golf course and are very familiar with the noises they can generate. We will be investing a large portion of our net worth into our home and property. We are planning on living there a long time (fifteen to twenty years) and would not want the above issues to preclude us from doing so or cause us to lose money on our investment. By the way, we will not hesitate to file noise or disturbance of the peace complaints if we find any noise from the development offensive. In order to avoid any problems in the future and to ensure that we all get along, I would appreciate the above concerns being addressed and incorporated in the final EIR report. Please feel free to call us with any questions or comments.

Sincerely,



Shelley E. Moeller

3. Although an easement for a shared-use trail would be dedicated by the project, the trail would not be constructed by the applicant. The issue of whether or not bicycles would be permitted on this trail would be addressed by the County Parks and Recreation Department in the environmental review process for the trail, which would be required prior to their construction of the trail.

Z 2

RECEIVED
PLANNING OFFICE
96 APR -9 AM 10: 30

Dwayne and Cathy Turpin
665 Highland Avenue
San Martin, California 95046
April 6, 1996

Juanell Waldo
Santa Clara County Office of Advance Planning
County Government Center, East Wing
70 W. Hedding Street
San Jose, California 95110

Dear Juanell:

As a neighbor of the Lion's Gate Project we are directly concerned by the following items that have been glossed over in the DEIR.

Flooding Hazards

1 For the past two years the section of the West Llagas Creek that runs through my property has crested and has over run its banks on neighboring properties. This is without any land being paved over or irrigation in process. If this project is allowed to continue we will definitely flood.

2 According to area maps this project lies within a FEMA flood zone. County regulations forbid building in flood zones. Why is this project an exception?

3 If this project is allowed to proceed and it causes flood damage to our property, we want a stipulation that the developers will cover any damages to our property and expenses we may incur. Also the County should plan on dredging the creek in our property and building a berm on the structure side of the creek to alleviate damages.

4 There is only passing mention of the drainage proposal for the six unit cluster housing bordering Coolidge Avenue. It is planned that they will drain directly into the west Branch of the Llagas Creek. This alone will cause us to be underwater during next winter's rains.

Urbanization

5 Throughout the DEIR it is stating that this project is consistent with the changing of this area from rural to urban in character. This area of San Martin is certainly not urban in

Z2. Response to Dwayne and Cathy Turpin

1. As noted in the DEIR, the detention basins, lakes and ponds to be incorporated into the project would provide sufficient storage during major flood events such that downstream flooding impacts would be reduced relative to current conditions.

2. Building is not permitted in the 'floodway' portion of the flood-prone area, which carries 99 percent of the flow. However, building and fill is permitted in adjacent areas subject to shallow flooding, provided an equivalent area of storage capacity is provided on-site such that the overall volumetric capacity of the flood zone is not reduced and the boundary of the flood-prone area is not expanded. As discussed in the DEIR, the project complies with these requirements.

3. As noted in the DEIR, the project would not result in increased downstream flooding hazard.

4. According to the project engineers, Forsgren Associates, the drainage from the six-unit cluster development would drain to a small retention basin located in the northeastern portion of this site. (The DEIR has been revised to incorporate this new information.) Since the impervious surface coverage added by the project would represent less than 10 percent of this area, the additional runoff would be minor and would be readily accommodated in a small basin. Thus this portion of the project would not increase flooding potential downstream.

5. See following page for response.

5 any sense of the word. It is changing from rural to rural-residential and this commercial
6 project is thoroughly inconsistent with the present zoning and the established neighbor hoods. Cluster housing is inconsistent with the rural ambiance now present in this area no matter how much open space surrounds them. The grape vineyard proposed as screen for the project is inadequate. Grape vines do not provide much in the way of
7 screening and require a great deal of water. We should know as we have 75 plants on our property.

Traffic

8 The traffic control study was done two years ago. Much housing has been developed
9 along Santa Teresa in Gilroy since then. The traffic is much heavier than this study leads one to believe.

10 The traffic projection table on page 157 is so inaccurate that it is unbelievable. Of the 41 new homes to be built, it will only generate 19 trips out during peak a.m. hour. Most homes will be two income families and this figure is way off base for that. The
11 restaurant has only 22 trips in during p.m. peak hour. This place will surely go broke! They have the audacity to subtract trips for the 7 ranch workers who will lose their jobs
12 due to this project. There is absolutely no mention of the number of employees that will be part of this development: gardeners, restaurant, lounge, pro shop, motel, maintenance. It surely will have a significant impact on this traffic study.

13 Throughout the DEIR there is constant mention of "low projected traffic volumes". How can one sink millions of dollars into a project and expect to recoup their investment with a statement like that? Any development open to the public will have a high projected volume of traffic.

Our two lane country road, Highland Avenue, is proposed to be the main "gateway" into
14 this development. There is already lots of congestion at the new justice facility at the intersection of Monterey and Highland. Our country lane simply is inadequate to handle the reality of the traffic that will come.

15 If this project is allowed then we will be living at the intersection of two major traffic arteries. This is certainly not what we envisioned when we moved here two years ago. It will adversely affect our property values. We want to be compensated if this project lowers our value. At our expense we will have our property appraised to provide the developers a baseline value. Other neighbors feel the same as we do.

Dwayne & Patty Tuttle

5. Comment noted. The DEIR states that the Morgan Hill-San Martin area is changing from rural to urban in character. The EIR has been amended to add that the character of the immediate project vicinity is in transition from undeveloped rural agriculture to developed rural residential. (See Section *V. TEXT AMENDMENTS.)*

6. The proposed cluster housing is consistent with the rural residential subdivision adjacent to the site at the corner of Coolidge and Highland Avenues. It is also consistent with the General Plan designations for western San Martin, which is predominantly Rural Residential. The San Martin Community Plan specifically encourages the clustering of this Rural Residential development.

7. In addition to vineyards (and/or orchards), a landscaped berm would be placed along the Coolidge Avenue frontage. Combined with the 300-foot setback area to be planted in grapes or orchards, these elements would provide adequate visual screening and buffering from nearby residences.

8. The traffic study was completed in April 1995 and included all the projects in the cities of Gilroy, Morgan Hill and unincorporated Santa Clara County approved up to that date. Since the release of that study, a new development in Gilroy (Deer Park/Rancho Hills) was approved that included 294 new units. However, it is expected that only minor traffic would be added to the project area from this development which lies several miles to the south.

9. The trip generation rates used in the study were taken from the *Institute of Transportation Engineers Trip Generation,* which is the most comprehensive source available. The peak hour traffic estimates used in the study represent only the two busiest hours of the day in terms of the total traffic traveling on the street. This is also the busiest hour for residential uses. However, it is common for some uses to have busier periods during other times of the day. For example, restaurants typically reach their highest activity between 6:00 to 8:00 p.m., and do not have their highest traffic generation during the peak commute hours studied for level of service impacts.

10. Single-family residences generate an average of 10 trips per day, of which 10 percent or one trip would occur during the p.m. peak hour, and 0.74 percent would occur during the a.m. peak hour. Of these a.m. trips, 74 percent would be outbound as shown on the referenced Table 10 on page 157 of the DEIR. These are professionally accepted generation rates, based on numerous studies, and are applied to all developments of this nature. It is important to note that not all outbound morning trips occur during the same hour, but are spread out over several hours, only one of which is the a.m. peak hour.

11. As noted in Response #8 and above, the peak usership for restaurants does not coincide with the p.m. peak for traffic, but occurs later in the evening.

12. The trip generation estimates for non-residential uses already include all types of traffic for employees, visitors, delivery and maintenance purposes. (See Appendix C of the Traffic Study, in Appendix H of the DEIR, for a full discussion of specific traffic generation factors for the golf facility.)

13. The projected traffic volumes for the golf course are based on many studies done at similar facilities which, have been repeatedly shown to be light traffic generators.

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14. The intersection of Monterey/Highland is controlled by a traffic signal and has been shown to operate under minor traffic delays during peak hours (Level of Service A or B). Added traffic from approved projects and the proposed project would not significantly change this condition. The peak hour conditions would still function at LOS B, which is deemed to be acceptable by County standards.

15. Comment noted. Under CEQA, the preparation of EIR, is to be confined to an analysis of potential physical impacts. Since other effects such as potential social and economic impacts do not fall within the scope of EIR review, questions of property value are not required to be addressed under CEQA.

Z3

April 29, 1996

Laurell Waldo
County of Santa Clara
Environmental Planning Dept.
70 West Hedding St. 7th Floor
San Jose, CA 95110

RECEIVED
PLANNING OFFICE
96 APR 31 AM 11:14

Re: EIR Lion's Gate Reserve

Dear Mr. Waldo,

As a landowner in San Martin and after reviewing the Draft EIR for the proposed project, I feel Hix Rubenstein Companies have created an environmentally sensitive project.

The proposed use of Lion's Gate Reserve for a golf course, overnight facilities, restaurant and homes will be a good use of the land. This is a beautiful piece of property that can then be appreciated by more of the population.

1

At present San Martin has no overnight facility, nor anything that would entice one to stay such a beautiful area. I feel it's a compliment to San Martin to have a well designed project like this come into our area. Furthermore it will add fire protection and increase existing property values to our area.

Sincerely,
Jeanne Wentzel

Z3. Response to Royanne Ukestad

1. Comments noted. No response required.

V. PUBLIC HEARING COMMENTS AND RESPONSES

The following are not verbatim comments, but are a summary of the issues raised at the May 2, 1996 public hearing held by the Planning Commission on the Draft EIR. Each comment is followed by a response in italics.

AA. Comment by Julia Bott, Sierra Club

Ms Bott summarized the written comments submitted by the Sierra Club - Loma Prieta Chapter (see Comments Letter P).

Refer to Response P.

BB. Comments by Camas Hubenthal, Committee for Green Foothills

Ms Hubenthal summarized the written comments submitted by the Committee For Green Foothills (see Comment Letter M).

Refer to Response M.

CC. Comments by Vicki Moore, Greenbelt Alliance

Ms Moore summarized the written comments submitted by Greenbelt Alliance (see Comment Letter N).

Refer to Response N.

DD. Comments of Pat Forst, Forst Commercial Real Estate

Ms Forst summarized her written comments (see Comment Letter R).

Refer to Response R.

EE. Comments of Craig Breon, Santa Clara County Audubon Society

Mr. Breon summarized the written comments submitted by the Santa Clara County Audubon Society (see Comment Letter O).

Refer to Response O.

FF. Comments of Steve Havens, Twin Valley, Inc.

Mr. Havens summarized his written comments (see Comment Letter T).

Refer to Response T.

GG. Comments of Bob Murphy, Northern California Golf Association

Complemented Tom Hix for doing a great job in undertaking a very thorough planning effort in which every environmental concern has been met in the proposed project.

Discussed the shortage of golf courses in Santa Clara County, and how golfers are forced to travel outside the valley to play.

The project complies with every guideline proposed by the County, whereas if the guidelines were applied to existing golf courses in the County, 80 percent of them would not comply.

There is nothing unprecedented about this project. There are many instances of golf courses being developed in places far more pristine than Hayes Valley, and they demonstrate how golf courses can successfully co-exist with nature and the environment.

This does not represent intense development, but rather the project will be very pastoral and will preserve open space. This project is opposed by people who don't play golf, and don't like golf, and don't want others to play golf either.

Comments noted. No response required.

HH. Comments of Bob Ukestad, West San Martin Water Works

With respect to concerns over the adequacy of water supply, West San Martin Water Works was not hindered at all during the drought by water shortages. Although water customers were encouraged to conserve water, the company did not institute any rationing program. At the peak of the drought, the water level dropped to 112 feet below the ground surface, and it is currently at 30 feet below ground surface after all the rains. During the drought, the water company never had to adjust or lower the pumps in their wells, which are at 400 feet below the ground surface. In fact, there is a lot less water being drawn now than years ago when the area was mainly in agriculture.

Mr. Ukestad gave assurances that the water company would be able to accommodate any water service required by the Lion's Gate project, including all domestic and fire protection requirements.

The water company is currently in the engineering design phase for a 300,000 gallon storage tank that will greatly enhance the fire protection in the area.

Comments noted. No response required.

II. Comments of Royanne Ukestad

Ms Ukestad summarized her written comments (see Comment Letter Z.3).

Refer to Response Z.3.

JJ. Comments of Chris Williams

Commended the thoroughness of the EIR in addressing the issues, and believes that the project will be a model for the County.

Comments noted. No response required.

KK. Comments of John Ambrose

Mr. Ambrose summarized his written comments (see Comment Letter U).

Refer to Response U.

LL. Comments of Thomas Kruse, Planning Commissioner

Commissioner Kruse is concerned that this project will be precedent-setting in this County, if not elsewhere. This project is somewhat unique in that it is fairly large in scope and has commercial, recreational, residential, and open space uses plus a sewage treatment plant. The fact that all these uses are combined in one project makes it somewhat unique. Because of its size and scope and diversity of uses, the Planning Commission should be circumspect and thoughtful in gauging the merits of this application.

The project includes a large acreage, but also demonstrates how the hillside cluster ordinance operates to concentrate permissible development in a confined area while preserving the vast majority of the site as permanent open space. Although the minimum required density for the project is 36 acres per lot, the cluster ordinance provides for 41 lots due to the large size of the site.

All of the uses proposed in the project are permitted in the applicable General Plan and zoning provisions for this site. While a specific project including a golf course and residential subdivision may not have been previously approved in the County, it has been a permitted combination of uses in HS zone for many years. Therefore, it would not be precedent setting in the sense that it would represent a combination of land uses not previously permitted in the County.

In terms of overall intensity of the development, the total coverage of buildings is 1.5 percent over the 410-acre development area (including the golf course area), and 0.4 percent of the total site area. The total coverage by all impervious surfaces, including buildings, roads, cart paths and parking areas is 6 percent over the 410-acre development area, and 1.5 percent of the total site area. Compared with 40 to 50 percent for a typical suburban subdivision, and 80 to 95 percent for industrial park or commercial retail development, the proposed coverages do not represent a large scale or intense development.

The package wastewater treatment plant was included at the recommendation of the County Department of Environmental Health and the Regional Water Quality Control Board, in order to avoid the use of conventional septic systems. This facility would be sized to serve the proposed project only, and it would be extremely difficult if not impossible to expand to accommodate

additional hookups in San Martin. (See Section *II. OVERVIEW OF MAIN ISSUES DISCUSSED IN COMMENTS ON DEIR, D. GROWTH INDUCEMENT.)*

With respect to Section *III. B. AGRICULTURE,* it is understood that the relocation of housing from the floor of Hayes Valley necessitates taking the frontage parcel out of agriculture. The EIR states that the loss of 110 acres of prime agricultural land would be offset by the planting of vineyards in areas not proposed for development, and by the fact that the site is not economically viable for cultivation. The latter argument is a myth perpetuated over and over, and is used every time someone who doesn't want to farm anymore, or where it is more profitable to do something else. Taken to its logical extreme, this means that agriculture would be forced out of the County, which is not reasonable or desirable. The County has just completed an agricultural preservation study to try to help preserve agriculture. Granted there are interface problems where you have a mixture of rural and non-rural uses, and the project addresses this by providing buffer zones along the eastern frontage.

The Niles report on agricultural economics of the site states that crop yields are lower in Santa Clara County, but with local soil and climate conditions yields should be as good as anywhere. It is unclear from the analysis how Santa Clara County is at a competitive disadvantage to the San Joaquin Valley for agricultural production.

Refer to Response J.3.

It is unclear in the DEIR how many acres of vineyard would be planted or where they would be located.

Refer to Response J.1.

With respect to parks and open space, the EIR stresses that 1,265 acres would be preserved as open space. There is a concern that the open space should be permanent open space and that a portion should be dedicated to an agency so that the homeowners association or somebody can not change this is in the future.

As required by Policy R-LU 20 of the 1995 County General Plan, an open space or conservation easement over the permanent open space area would be dedicated to the County.

The Citizens Planning Advisory Committee for San Martin was supportive of the project, but only as a golf course, and not a project that later would be converted to a subdivision. In order to ensure that the golf course remains on this site, the applicant should agree to the dedication of the development rights over the golf course itself to permanent open space so that the use could not be changed in the future.

The question of whether the development rights to the golf course area should be relinquished is a policy decision and therefore is outside the scope of this EIR.

With respect to hydrology, the analysis is good but there is a concern with the berms along Coolidge Avenue having the potential to deflect flood waters to homes to the north unless breaks are provided in the berms.

The berm along Coolidge Avenue would be designed with sufficient breaks such that the direction of sheet flows during major storm events would not be altered relative to existing conditions. The EIR has been revised to clarify this point. (See Section V. TEXT AMENDMENTS.)

With respect to water quality, it is a good idea to use Twin Valley water, which has a high nitrate content, since the water quality would be improved through utilization of the nitrogen.

Comments noted. No response required.

With respect to biological resources, positive things are planned such as the planting of many trees and the creation of new ponds. Since much of the wildlife is nocturnal, it would be desirable to have the developers impose upon themselves limits on nighttime operations, lighting and noise.

No nighttime activities are planned for the golf course or practice area/driving range. Evening activities would be confined to the clubhouse, restaurant and overnight complex. The lighting of the buildings and parking areas would be directed downward so as not to illuminate adjacent areas. Noise generation would be minimal except for occasional weddings when music would be played. These activities would be confined to a small area of the site and would not significantly interfere with wildlife use of the site.

Commissioner Kruse is satisfied with the archaeological and historic resources portions of the EIR.

Comment noted. No response required.

With respect to visual and aesthetic impacts, it is noted that the subdivision would be set back from the edge of the property. From the western site boundary, a very small portion of the maintenance building may be visible from Watsonville Road.

Comment noted. No response required.

Regarding traffic, there is concern that traffic has been understated. Other uses have not been addressed, such as banquets, weddings and other functions, with an inordinate number of people coming to the site.

Occasional functions such as weddings and banquets occur in the evenings or on weekends, when background traffic volumes are lowest. The analysis of traffic impacts focuses on the peak commute periods when the background traffic levels would be highest, and when traffic generated by the project would be highest. Although functions at the clubhouse may attract up to several hundred participants, the resulting traffic impacts would not be significant because of the low ambient traffic levels for those events. For example, the project would generate almost 100 trips during the p.m. peak hour, which would result in no traffic impacts. For large events like weddings, the clubhouse would have capacity for 200 guests. Assuming 2 people per car, 100 trips could be generated before and after such an event. However, since such events would occur on weekends when background traffic levels are low, no traffic impacts would result.

With respect to noise, it is believed that all noise would be contained within the valley. The air quality impacts would be negligible to slightly impaired. Hazardous materials impacts will be avoided if the project complies with the Golf Course Guidelines and the Audubon program. There is no concern with electromagnetic fields.

Comments noted. No response required.

With respect to water supply, there are concerns with potential impacts on neighboring wells. There still needs to be a lot of work done to determine availability of retrievable water supply. The assumptions made by the hydrologists about the water supplies on the site have yet to be confirmed. Assumptions regarding depth of alluvium, transmissivity, and specific yield still need to be tested out. There is a need for test wells and one or more monitoring wells. The calculations made by Geoconsultants regarding how much groundwater is available for withdrawal are probably realistic. However, there should be a formula for less-than-average rainfall years so precautions can be taken to prevent overdraft and subsidence and permanent loss of the aquifer.

Refer to Response J. See also Section II. OVERVIEW OF MAIN ISSUES DISCUSSED IN COMMENTS ON EIR, A. WATER SUPPLY..

Bob Ukestad of the West San Martin Water Works indicated that the golf course would pay the same rate as domestic users. This is of concern because it provides an incentive to rely overly heavily on on-site groundwater, which would be cheaper to obtain.

Since the time of the May 2 Planning Commission hearing, Mr. Ukestad has indicated in writing that any water conveyed to the Lion's Gate project for irrigation purposes would be charged at approximately 35 to 42 percent of the rate for domestic supply. The letter from Mr. Ukestad has been added to Appendix P of the EIR. (See Section VI. REVISIONS TO THE APPENDICES OF THE EIR.)

One of the biggest concerns is with intensity of use and the amount of development on the site itself. There are always plusses and minuses for a project of this size and scope. Most people in the South County who want to see this project never want to see it change, so the developer should relinquish development rights over the golf course itself.

Refer to the response to the first comment above regarding the issue of project intensity and scope. The question of whether development rights to the golf course should be relinquished is a policy decision which is outside the scope of this EIR.

MM. Comments of Brent Ventura, Planning Commissioner

The concerns with agricultural lands is something of a threshold issue, and the EIR should include further analysis of this issue. There are varying figures in the EIR regarding the amount of agricultural land that would be permanently converted to non-agricultural use by this project.

Comment noted. The EIR has been revised to clarify this issue. (See Section V. TEXT AMENDMENTS.)

Where will the 110 acres of vineyard be planted. Do these areas comprise prime soils or something else?

As discussed on pages 18 and 67 of the DEIR, 10 acres of vineyard would be planted along the eastern project frontage along Coolidge Avenue, and 100 acres would be planted at the western end of the site near Watsonville Road. These areas comprise Class II, III and IV soils, and are not designated as "Prime Farmlands." (Note that this mitigation has been revised to include vineyards and/or orchards.)

The other issue is why can't further efforts be made to move the houses and amenities of the project so as to preserve more of the agricultural soils. One of the top goals of the County's General Plan policies and zoning is to preserve agricultural land in the South County. To allow this acreage to be converted based on the argument that it is no longer viable will set a precedent that can be used by applicants in the future, which runs contrary to policy. This issue needs to be further addressed in the environmental document.

The hillside cluster subdivision is planned for the field along Turlock Avenue largely to avoid placing the lots in the interior of the valley, which could involve significant impacts. For example, additional roadways and homesites in the interior of the site would require more piping and crossing of streams, and the internal traffic would result in greater potential mortality to California tiger salamanders and western pond turtles. This alternative would likely necessitate removal of oak woodland and would generally reduce the wildlife habitat value of the site. To provide a full discussion of this scenario, a new project alternative has been added to the EIR. (See Section V. TEXT AMENDMENTS.) The proposal to place the cluster subdivision on the agricultural land is not driven by the fact that the agricultural land was no longer viable, but rather that it represents the least environmental damaging alternative location for the residential lots when all environmental factors are considered. The lack of agricultural viability is not relevant to the siting issue, but rather is the conclusion of the agricultural impact analysis required for the EIR, which was undertaken long after the current project was first proposed and designed.

With respect to open space dedication, further evaluation needs to be undertaken regarding the types of easements to be dedicated and the agencies to which they might be dedicated to.

As required by Policy R-LU 20 of the 1995 County General Plan, an open space or conservation easement would be dedicated over the permanent open space area. (The issue of whether a conservation easement should be required over the golf course area requires a policy decision and is therefore outside the scope of the EIR.) The specific provisions of such easements are to be reviewed by the Planning Commission and county counsel. These are policy and administrative matters which are not required by CEQA to be discussed in EIRs.

Regarding visual and aesthetics, another analysis is requested of what they project will look like on-site and off-site.

The visual aspects of the project are addressed in Section III. J. of the DEIR. As discussed, only the cluster subdivisions and the equestrian center along the eastern site frontage would be visible from off-site public locations. (As noted in the DEIR, there is one private residence with

views over the site from the adjacent ridge to the north.) The potential visual impacts along the eastern site frontage would be mitigated with landscaped frontage berms as shown in the artist's rendering in Figure 16 (Revised). Since no other aspects of the project would be visible from public roadways or inhabited areas, no further illustrations of visual impact are necessary. However, the DEIR does contain site plans for the golf course and the residential areas, as well as renderings of the clubhouse complex (and a floor plan and building elevations of the equestrian center have been added) to provide visual illustrations of these aspects of the project. In addition, a model of the project is currently being constructed.

With respect to the overnight units, the environmental document should include a discussion regarding the convertability of the overnight units to permanent residential units. What kind of mechanisms can be included to assure that there will not be a problem in this regard?

As shown in the detailed site plan for the clubhouse vicinity (Figure 10a of the DEIR), the cart paths providing access to the overnight units are 10 feet wide, with sharp curves, and have the units clustered closely along the path. With this layout it would be impossible to convert these paths into vehicle access drives that would meet County standards. Thus the possibility of future vehicular access is precluded in the site plan itself. Any future proposal to change the site plan would require an application for a use permit modification which would require a Planning Commission hearing. Any thoughts of converting these units to residential would be futile since a General Pan Amendment would be required, and the General Plan contains no residential categories that could be used for this purpose.

Given the amount of recharge and reuse of water proposed on the site, the EIR did not contain much of a discussion of odors associated with those processes, which should be addressed.

The potential odor impacts associated with the wastewater treatment process are fully addressed on pages 199 and 200 of the DEIR.

Regarding the County's Golf Course Design Guidelines, one of the things being considered that should be addressed is counting the trees that are going to be impacted as trees that are to be removed. However, given the number of trees that are going to be planted, this should not be a significant issue.

A review of the project site plans indicates that as many as 6 trees are located adjacent to proposed roadways. Without more detailed engineering plans for the roadways, the potential for impact is difficult to determine. Even if some of these trees do not survive despite efforts to avoid impacts, the proposed planting of over 2,500 trees on the site would certainly compensate for this loss.

There is a concern for the restoration and creation of habitat, particularly riparian corridors and habitat for turtles, salamanders and avian predators. What habitat is going to be created or restored for them and where on-site will this occur? The model courses at Spanish Bay and Granite Bay have left the environment in better shape than it was before development. It is hinted that these things will occur but the specifics are skimmed over in the DEIR, and should receive further review.

With respect to the habitat restoration for riparian corridors and habitat for California tiger salamanders and western pond turtles, these programs are described in detail in the reports by LSA Associates contained in Appendix F, and are summarized in the text of the DEIR. These programs include detailed restoration plans and monitoring programs. It is not clear which aspects of these programs are believed to have been "skimmed over" in the DEIR.

With respect to "avian predators" such as eagles and other raptors, the DEIR and the biological report by H.T. Harvey and Associates state that the on-site grasslands comprise a small percentage of the overall foraging areas for these birds, and the removal of a portion of the on-site grasslands would not have a significant adverse impact on these species. There are no known raptor nests within the project site or in proximity to the development area, although preconstruction surveys for any newly established nests would be undertaken, with mitigation and avoidance measures taken if any such nests are found.

The EIR addresses growth-inducing aspects of the golf course, but does not speak to the growth inducement resulting from this golf course development, which is beyond just a golf course. The package treatment plant in particular is a non-rural, growth-inducing aspect of this development, and that needs to be addressed.

The growth-inducement discussion in the DEIR, commencing at page 224, addresses not only the growth inducement potential from the golf course complex but also the residential development, as well as the proposed General Plan amendment.

With respect to the package treatment plant, the DEIR at page 225 states: "The wastewater treatment and disposal system proposed for the project would not have any excess capacity beyond what is needed for the project." That is, the treatment capacity would be limited to 30,000 gallons per day, which represents the peak daily flows from the project as proposed. Since all developments rights on the project site would be taken by the project, it is difficult to envision off-site locations for which extension of sewer service would be desirable or practical given the distances from the treatment plant and the low density of Rural Residential development allowed in the vicinity under the General Plan. Even if a treatment plant expansion were to be proposed, the operating permits from the County Department of Environmental Health and the Regional Board would require modification, and the required expansion of the Community Services District would require the approval of LAFCO.

*As a practical matter it would be difficult to expand the treatment system once it is installed. All of the components of the package wastewater treatment facility would be sized to serve only the Lion's Gate project. It would be very difficult if not impossible to add to the system at a later date to accommodate additional development. The proposed treatment plant site is in a constrained location with very limited area available for expansion. Additionally, it would not be possible to expand the effluent disposal pond given its location on top of a knoll, and there are no suitable locations for additional ponds nearby. Also, new pipeline would have to be laid and pump stations added. Moreover, it is unclear what the incentive would be to the homeowners association and the country club for tolerating the inconvenience and nuisance of a system expansion that would not benefit them. (*See also Section *II. OVERVIEW OF MAIN ISSUES DISCUSSED IN COMMENTS ON DEIR, A. WATER SUPPLY.)*

The EIR should include an analysis of whether or not the development raises the value of surrounding land, and therefore is a growth-inducing driver in that area. Increased land values would make the land more developable, and more interest would be generated for more overnight units in the area.

CEQA does not require EIRs to include analyses of economic impacts, which would include assessments of property values. Thus any discussion of the connection between property values and growth-inducement is outside the scope of the EIR.

With respect to project alternatives, the EIR should incorporate an alternative that would preserve more of the prime agricultural land on the site.

Comment acknowledged. The EIR has been revised to add a new project alternative which avoids impacts to prime agricultural land, as suggested. (See Section V. TEXT AMENDMENTS.)

Regarding riparian corridors, an attempt should be made to eliminate some of the proposed creek crossings, and to keep a minimum 100-foot buffer from any turf, rough or parking areas.

Subsequent to the release of the DEIR, the applicant revised the development plan to eliminate 5 golf cart bridges, leaving 8 cart bridges and 3 roadway bridges in the plan. (See Section V. TEXT AMENDMENTS.)

As discussed on pages 127-8 of the DEIR, the golf course plan conforms with the setback requirements for varying environmental conditions, as established by H.T. Harvey and Associates, a well-qualified ecological consulting firm.

NN. Comments of Tom Tanner, Planning Commissioner

On page 54 of the DEIR there is a discussion of the conformance of the project with Policy SCl-7 which states that urban development shall occur in an orderly and contiguous pattern. The EIR does not address this statement, particularly with regard to the overnight units, which are urban. Likewise, the DEIR does not address Policy SCl-10 which states that urban developments shall only occur in cities.

The finding required in the HS zoning ordinance to determine the appropriateness of the overnight accommodations is that they be "consistent with both the scale of the golf course development and the rural character of the zoning district." The proposed overnight accommodations would be constructed as a series of adobe cottages following the natural contours. Having a low profile with much variation in building plans and rooflines, these units would not appear as a massive hotel but would blend in with the surroundings. The total floor area of the overnight complex would be approximately the same as the clubhouse itself, and thus would be consistent with the scale and character of the clubhouse, which also would be built in the adobe style.

The 45 units of single-story overnight accommodation would comprise approximately 34,000 square feet of floor area. This represents 0.3 percent of the total golf course area, 0.2 percent of the total development area, and 0.05 percent of the total site area. This does not represent urban scale or intensity, or a development that would significantly affect the rural character of the

area, particularly considering that the overnight units would not be visible to the public from off-site locations. It should be noted that the original proposal was for 60 overnight units, which was scaled back to 45 units when the 9-hole academy course was eliminated from the project.

There is somewhat of a conflict between General Plan Policy R-LU 18(g) and the Hillside zoning ordinance regarding commercial and industrial uses in rural settings. The General Plan policy permits commercial and industrial uses which by their very nature require a rural setting. However, a golf course does not necessarily require a rural setting, and overnight units do not require a rural setting. On the other hand, the Hillside Zoning Ordinance specifically identifies overnight units as being permitted. There seems to be somewhat of an inconsistency between the General Plan and the Hillsdale Zoning Ordinance in this regard.

Refer to the above response.

V. TEXT AMENDMENTS

The following sections of the Draft EIR are amended as noted below. New wording is underlined. Deleted wording is ~~lined out~~.

SUMMARY

B. SUMMARY OF IMPACTS AND MITIGATIONS

B. AGRICULTURE

p.ii Revise Mitigation 1 as follows:

The loss of approximately 110 acres of prime farmland would be offset by the planting of vineyards and/or orchards in areas not proposed for development. ~~and by the fact that the site is not economically viable for cultivation.~~

p.vii Revise Impact 3 as follows:

3. The project would result in the loss of ~~1.7~~ 0.83 acres of riparian vegetation or in the reduction of habitat quality in the riparian zone. **(Potential Significant Impact)**

G. BIOLOGICAL RESOURCES

p.ix Revise Impact 12 as follows:

12. The project would eliminate approximately ~~1.5~~ 1.2 acres of existing wetlands on the site.

H. ARCHAEOLOGY

p.x Revise Mitigation 2b as follows:

b. ~~Any human remains that are discovered shall be removed, the remains shall be analyzed, a report shall be prepared, and if determined to be Native~~

~~American, the remains shall be reburied under the direction of a designated Native American group.~~

In the event that human skeletal remains are encountered, the applicant is required by County Ordinance No. B6-18 to immediately notify the County Medical Examiner/Coroner (299-5137). Upon determination by the County Medical Examiner/Coroner that the remains are Native America, the Coroner shall contact the California Native American Heritage Commission, pursuant to subdivision (c) 7050.5 of the Health and Safety Code, and the County Coordinator of Indian Affairs. NO FURTHER DISTURBANCE OF SITE MAY BE MADE EXCEPT AS AUTHORIZED BY THE COUNTY MEDICAL EXAMINER/CORONER. If artifacts are found on the site, a qualified archaeologist shall be contacted, along with full compliance with section B6-19 of the Santa Clara County Code.

I. PROJECT DESCRIPTION

B. DESCRIPTION OF THE PROPOSED PROJECT

p.14 Replace "Figure 9a" with "Figure 9a (Revised)" on the next page.

p.15 Replace "Figure 9b" with "Figure 9b (Revised) on the second next page.

Permanent Open Space Area

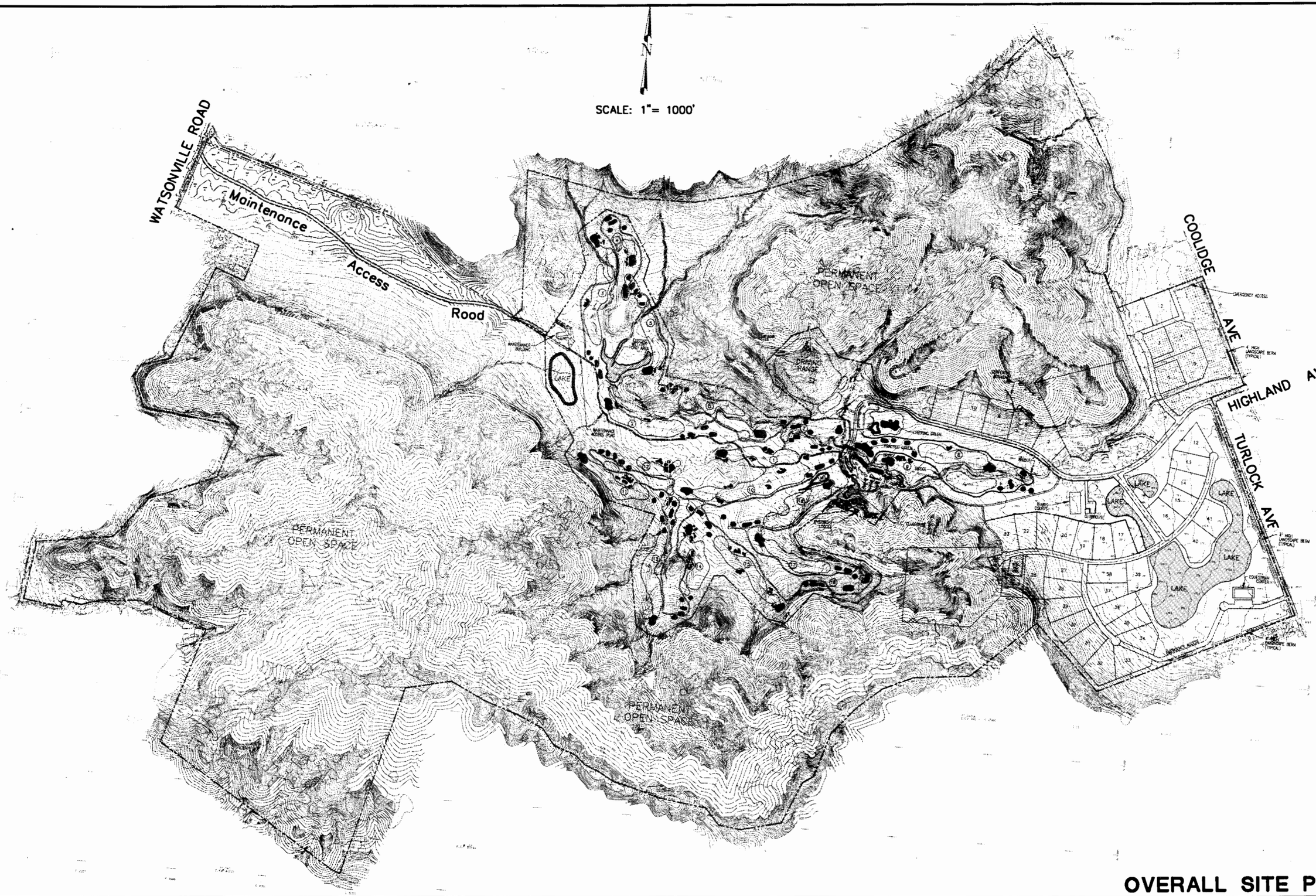
p.18 Revise the paragraph three, sentence one as follows:

> The permanent open space area would also include ~~100~~ 110 acres of vineyard to be planted in two areas.

p.18. Revise the fifth paragraph to add the following:

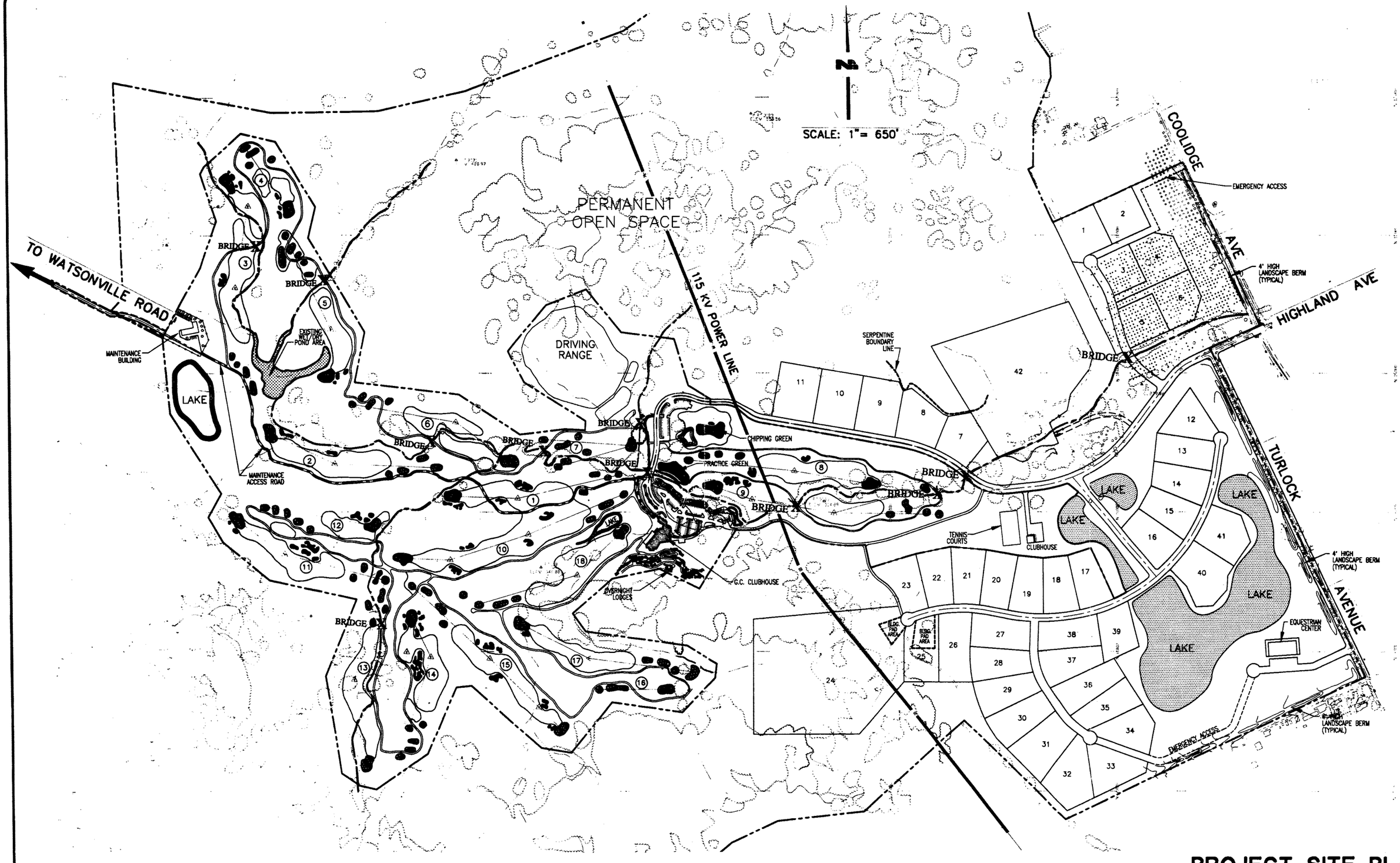
> The permanent open space areas of the site would be placed in the ownership of the homeowners association for the project ~~and~~. In accordance with County requirements, a conservation easement over the open space area would be dedicated to the County, but this open space area would not be open to the general public.

p.21 Replace "Figure 10a" with "Figure 10a (Revised)" on the third next page.



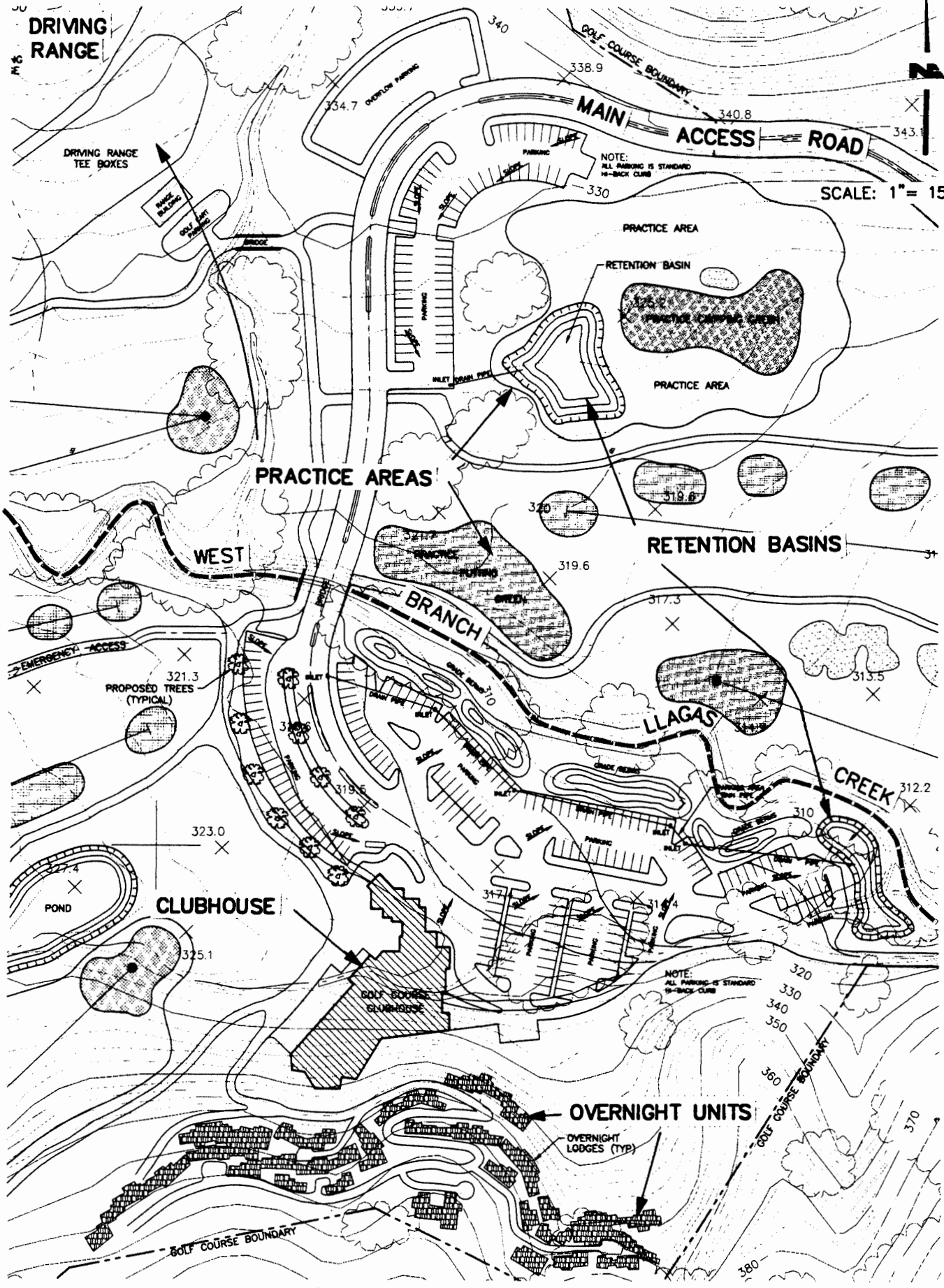
OVERALL SITE PLAN

FIGURE 9a (REVISED)



PROJECT SITE PLAN

FIGURE 9b (REVISED)



SITE PLAN - CLUBHOUSE VICINITY

FIGURE 10a (REVISED)

Equestrian Center

p.24 In the first paragraph, add the following after the first sentence:

(see Figure 9c)

p.24 In the first paragraph, add the following after the fifth sentence:

(see Figure 10c)

p.24 Revise paragraph two, sentence six as allows:

Any proposal to compost manure would require approval from the County Department of Health Solid Waste Unit and the Regional Water Quality Control Board.)

p.24 Insert the new Figure 10c after page 24, as shown on the following page.

Maintenance Facility

p.25 In paragraph one, add the following after the fourth sentence:

The treated water from the system would be recirculated for reuse in equipment washing. The accumulated sludges and other wastewater constituents would be dewatered and dried to a solid state and disposed of at a landfill. The washdown and chemical mixing areas would be covered to prevent rainwater from entering the system.

p.25 In paragraph one, add the following after the last sentence:

...with all stormwater from this area directed to grease traps before being released to the storm drain system.

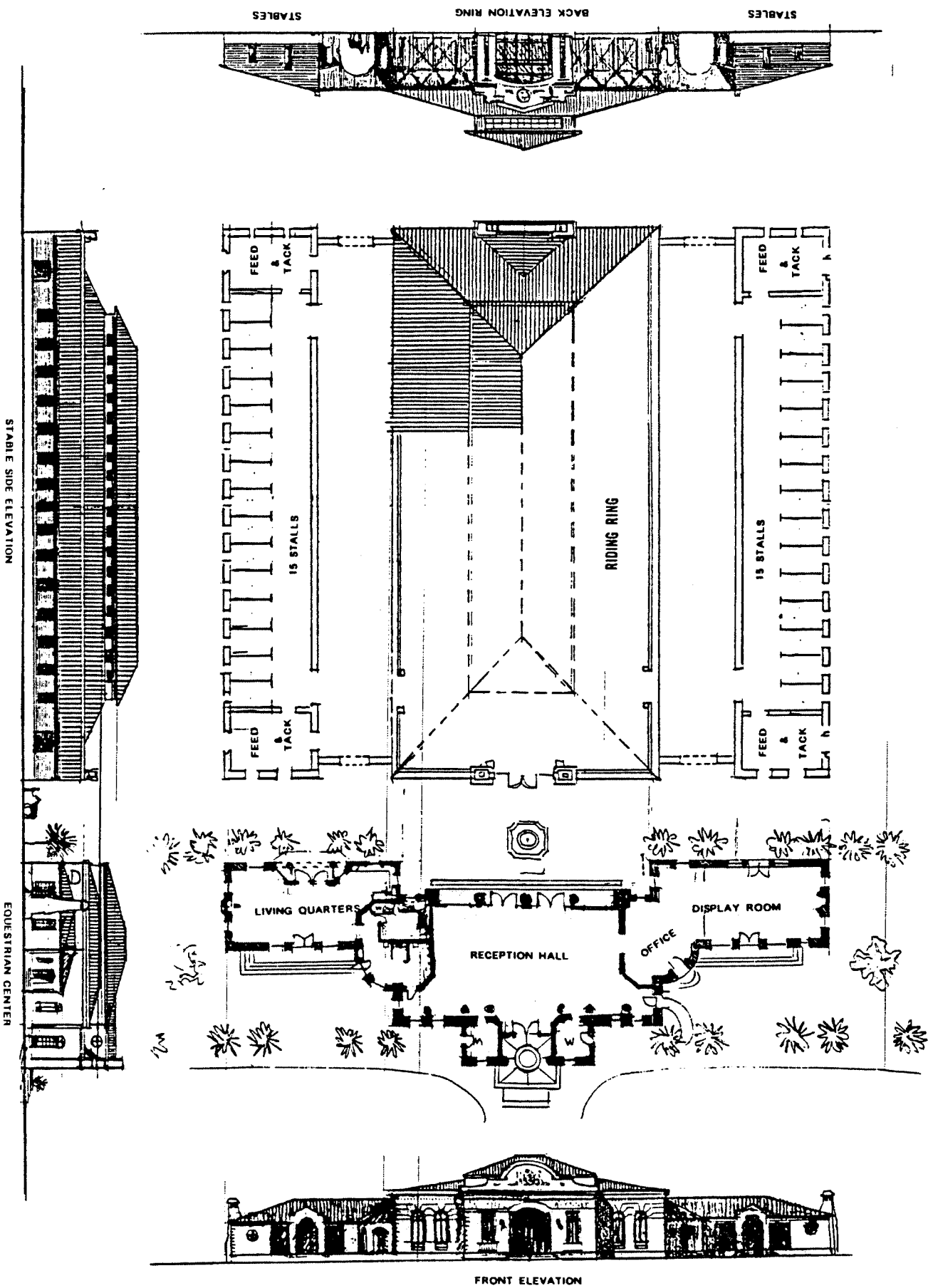
Access and Circulation

p.26 Revise the first paragraph on the page, sentence two as follows:

The cart path system would include ~~6~~ 4 bridges across West Branch Llagas Creek downstream of the existing pond, and an additional ~~7~~ 4 bridges across various tributaries to the main channel.

Drainage

p.27 Revise paragraph one, sentence three as follows:



SCALE: 1"= 50'

EQUESTRIAN CENTER PLAN

Source: Elmore Bohan Design

FIGURE 10c

~~Along the West Branch of Llagas Creek, there are two locations upstream of the clubhouse where small existing meanders would be removed in the golf plan.~~

Golf Course Drainage

p.27 Revise fifth paragraph as follows:

The putting greens would drain through vegetated turf buffers at least 25 feet wide and/or into water quality control basins, ~~dry wells,~~ or ponds. There would be grass-lined swales providing for a minimum of 25 feet of overland flow for filtration of runoff from these subsurface drainage collection areas before discharge. ~~or discharge would be to drywells located at least 25 feet from a wetland or riparian area.~~

Residential Drainage

p.27 Revise the first paragraph as follows:

The drainage from the Rural Residential subdivision located north of Highland Avenue would be conveyed ~~directly to the reach of West Branch Llagas Creek which flows through the southern portion of this area~~ to a small retention basin to be constructed in the northwest portion of this site.

Irrigation System

p.30 Revise the third paragraph as follows:

Irrigation during the rainy season would occur infrequently, perhaps an average of one day per week. Water requirements would be higher during the ~~6~~ 2-month grow-in period, when water would be applied at rates approximately ~~double~~ 10-percent higher than those estimated for the golf course once established

Grow-in would be scheduled for the spring or fall to avoid burning the seeds in the summer and to avoid the risk of washouts during the winter

Fertilization

p.30 In the third paragraph, add the following after the third sentence:

(Sampling for nitrogen would occur quarterly for the first three years, and semi-annually after that.)

Pest Management

p.31 After the fourth paragraph, add the following to the fourth bulleted item:

(See also "Maintenance Facility" above for a description of the washwater treatment and recycling system.)

E. USES OF THIS EIR

p.34 After the fifth item, add the following:

; and Water Quality Certification under Section 401 of the Clean Water Act.

II. CONSISTENCY WITH PLANS, POLICIES AND REGULATIONS

Agriculture

p.44 Revise the second paragraph on the page, sentences two and three as follows:

The proposed development of this parcel of land would result in the loss of approximately ~~100~~ 110 acres of prime farmland. The impact of this loss is reduced by the fact that agricultural cultivation of this site is ~~longer~~ marginally economically feasible at best.

Agriculture and Agriculture Resources

p.50 Revise the second paragraph, sentence two as follows:

The impact of this loss is somewhat reduced by the fact that agricultural production is ~~no longer~~ marginally economically viable on this site at best, and ~~by the fact that the project includes~~ would be mitigated by the planting of 110 acres of vineyards in areas not currently under cultivation.

Other Local Jurisdictions

Local Agency Formation Commission (LAFCO)

p.59 After the first paragraph, add the following new paragraphs:

LAFCO applies two general guidelines and eight policies in decisions involving the formation of special districts such as the Community Services District proposed for the Lion's Gate project. These guidelines and policies are set forth below, with each followed in turn by an analysis of the consistency of the proposed CSD formation with these policies.

A. General Guidelines

1. The proposed formation or incorporation should be based upon a need for services, maintenance of community identity, or controls which can best be provided by the agency proposed and upon the absence of existing alternatives that could provide the service or control in a more efficient manner.

Analysis: A Community Services District (CSD) is needed for the Lion's Gate Reserve project in order to provide for the on-going operation and maintenance of the on-site wastewater collection, treatment and disposal system. The CSD would also provide for the on-going funding of this service through a special assessment to be collected with the *ad valorum* taxes from the golf course operation and the residential property owners. The functions of the CSD may also include maintenance of roadways, storm drains, street lighting and landscaping, and other community services. Due to the multiple property ownerships within the area to be served by the CSD, no other alternative is available to provide the necessary services. The only other possible alternative mechanism is the formation of a County Service Area (CSA), but the County of Santa Clara has formed no such service areas to date, and has no administrative structure in place for the management of such entities.

2. The Commission encourages annexation to an existing city or special district over the incorporation/formation of a new local governmental agency.

Analysis: The Lion's Gate project is not located adjacent to an incorporated area to which it might be annexed. The nearest city is Morgan Hill, which has its southern boundary approximately one mile north of the Lion's Gate site. The project site also lies outside the Sphere of Influence of the City of Morgan Hill. The site is partially located within the unincorporated community of San Martin, which the County intends to remain unincorporated.

B. Incorporation and Formation Policies

1. A proposed incorporation or formation must satisfy a demonstrated need for services, and promote the health, safety, and welfare of the service community.

Analysis: The primary reason for forming the CSD is for the operation, maintenance and on-going funding of the package wastewater treatment facility planned for the project. This centralized treatment and disposal system was recommended over the use of conventional septic and leachfield systems by the County Department of Environmental Health and the Regional Water Quality Control Board because it would avoid the water quality impacts associated with conventional leachfields.

2. An area proposed for incorporation must be compact and contiguous, and possess a community identity.

Analysis: The area proposed to be served by the CSD would comprise a 410-acre contiguous area consisting of golf course facilities and residential development. This "community" would have a distinct identity and boundaries.

3. Any incorporation or formation proposal must define the relationship of the new district to existing agencies, including the County. The Commission will study the fiscal impacts of the proposal on existing agencies.

Analysis: The CSD would lie partially within and partially adjacent to the unincorporated Community of San Martin in the County of Santa Clara, and would be located approximately one mile south of the southern boundary of the City of Morgan Hill. The

County does not provide sanitary sewer service and there are no other agencies or special districts in the vicinity of the Lion's Gate site that provide sanitary sewer service.

4. A proposed incorporation or formation must not conflict with the normal and logical expansion of adjacent governmental agencies.

Analysis: The Lion's Gate site is outside the Sphere of Influence of the City of Morgan Hill. There are no other governmental agencies in the vicinity which could expand into the project area.

5. Applications to create new agencies, or to reorganize existing agencies, to provide urban level services on a neighborhood or community-wide scale, shall include a proponent-prepared feasibility study incorporating the following five elements:

a. Inventory of presently received local governmental services.

b. Roster of agencies that provide present services.

c. Determination of desired changes in governmental services, both in type and area served. The "area" concept will be considered both from the standpoint of efficient service territory, and for determining the level of environmental review necessary, pursuant to the California Environmental Quality Act (CEQA).

d. Proposal for a reorganization or formation which accomplishes the objectives set forth in 5c. The feasibility study shall address issues and factors of consideration specified in Government Code Sections 56425 (Sphere of Influence issues), 56653 (plan for services), and 56841 (factors to be considered in review of a proposal).

The study shall also consider appropriate alternatives which may include, but not be limited to:

(1) Continuing the status quo;

(2) Establishing a Municipal Advisory Council;

(3) Forming a County Service Area;

(4) Consolidating existing special districts within a Community Services District;

(5) Annexing to an existing city;

(6) Incorporating a new city.

e. Financial feasibility component consisting of projected revenues and expenditures that would result from implementing the proposal.

Analysis: The required feasibility study would be prepared in conjunction with the application to form the Community Services District.

6. The purpose of requiring the feasibility study at the outset of preparation is to enhance proponents efforts to:

   a. Design a proposal to satisfy their requirements;

   b. Communicate persuasively with the community when soliciting petition signatures; and

   c. Present their proposal effectively when seeking LAFCO approval.

   Analysis: The required feasibility study would be prepared subsequently, as noted under item 5.

7. LAFCO will review feasibility studies critically and consider consequences from a broader perspective than would be expected of proposal advocates.

   Analysis: See item 6, above.

8. For proposals affecting whole communities, LAFCO finds applications by voter petition generally preferable to applications by agency-adopted resolution, in that participation of persons representing the full range of the community spectrum should be assured.

   Analysis: Not applicable.

III. ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

B. AGRICULTURE

Environmental Setting

p.65 In the last paragraph on the page, revise the fourth sentence as follows:

> In addition, an area of approximately 300 acres ~~of Class II and III soils,~~ running along the length of the valley floor to Watsonville Road, ~~are~~ is designated as "Additional Farmland of Local Importance" on the 1992 update on the Important Farmlands Map (this area consists of Class III soils and the remaining portion of the Class II soils discussed above).

Impacts and Mitigation

p.66 Revise "Impact 1" as follows:

> **The development of the site would result in the loss of approximately 180 acres of the 220 acres of the Class II soils on the site,...**

p.67 After the first paragraph, add the following new paragraph:

In a supplement to the economic study, Dr. Niles undertook an analysis of a possible vineyard operation on the Hayes Valley site. The analysis considered a hypothetical 400 acres of vineyard on the site. Based on current yields and prices, the analysis concluded that it would take at least 10 years before such an operation would reach a break-even position. This is due to the extremely high start-up costs for vineyards, which would total almost $6 million (not including land costs) before the first harvest in the third year of operation. While a vineyard would ultimately be profitable, the conclusion reached was that such an operation would not be financially justified given the projected returns, the opportunity cost of capital and the risk of the operation.

p.67 Revise the second paragraph as follows:

Therefore, although the loss of prime farmland resulting from this project represents a potential significant impact, the severity of the impact is ~~reduced~~ moderated by the fact that this land is ~~no longer~~ marginally economically viable for agriculture at best.

Mitigation 1

p.67 Revise the first and second paragraphs as follows:

The loss of approximately 110 acres of prime farmland would be offset by the planting of vineyards and/or orchards in areas not proposed for development.

As noted under "Project Description," 10 acres of vineyard or orchard would be planted along the eastern project frontage on Coolidge Avenue. Additionally, approximately 100 acres of vineyard and/or orchard would be planted in the field at the western end of the project along Watsonville Road. The planting of the vineyards and/or orchards, ~~combined with the fact that agricultural cultivation of this property is not economically viable~~, as discussed above, would ~~reduce~~ moderate the impact of the loss of agricultural land to non-significant levels.

C. PARKS, RECREATION AND OPEN SPACE

Impact 1.

p.71 Revise the second paragraph, fourth sentence as follows:

The Hayes Valley site was ~~identified as a low priority (~~rated #26 of 42~~)~~ sites for open space preservation, placing it in the mid-range of priority for open space acquisition by the County's Open Space 2020 Task Force.

D. GEOLOGY AND SOILS

Impact 10.

p. 84 Revise fifth paragraph as follows:

As discussed in Section *III. P. Water Supply*, ~~on-site wells would be used to augment irrigation water supplies from Twin Valley, Inc.~~ ~~However~~, on-site groundwater pumping for irrigation water supply would not exceed the estimated safe yield of 280,000 gallons per day based on average daily use.

E. HYDROLOGY AND DRAINAGE

Mitigation 2.

p.93 Add the following to the first paragraph:

In addition, the frontage berms proposed along Coolidge and Turlock Avenues would include sufficient breaks within the flood-prone sections such that the direction of sheet flows during major storm events would not be altered relative to existing conditions.

F. WATER QUALITY

Mitigation 1.

p.97 In the first full paragraph on the page, revise the third sentence as follows:

In addition, implementation of the Storm Water Pollution Prevention Plan for the project would be subject to inspection by the Regional Water Quality Control Board and/or the State Water Resources Control Board. The Santa Clara Valley Water District may inspect construction activities within or adjacent to a waterway.

Mitigation 3.

p.97 Add the following to the first paragraph:

In addition, floatables/settleables traps would be installed at the parking lot collection points to separate out some contaminants before the runoff enters the retention basins, thereby reducing the amount of contaminants entering the retention basins. These traps would be inspected and cleaned periodically.

p.98 Revise the first paragraph as follows:

At the maintenance facility, ~~the adjacent paved areas would be surrounded by a 6-inch curb, with all rainwater, wash water, lubricants and other pollutants draining to~~ washwater from the equipment washing area, and drainage from the chemical mixing area would be conveyed to an advanced water filtering and recycling system. The treated water from the system would be recirculated for reuse in equipment washing. The accumulated sludges and other wastewater constituents would be dewatered and dried to a solid state and disposed of at a landfill. The washdown and chemical mixing areas would be covered to prevent rainwater from entering the system. The adjacent paved areas around the maintenance building would be surrounded by a 6-inch curb, with all stormwater from this area directed to grease traps before being released to the storm drain system.

G. BIOLOGICAL RESOURCES

Impact 3.

p.125 Revise the impact statement as follows:

> **The project would result in the loss of 0.83 acres of riparian vegetation or in the reduction of habitat quality in the riparian zone. (Potential Significant Impact)**

p.125 Revise the third paragraph, third sentence as follows:

> Approximately ~~1.7~~ 0.83 acres of riparian vegetation would be removed, of which ~~0.4~~ 0.33 acres would become "non-riparian" due either to diversion or filling of channels.

p.126 Replace "Figure 15" with "Figure 15 (Revised) on the next page.

p.127 Revise the third full paragraph (item 'c') second, third and fourth sentences as follows:

> Lost acreage would be replaced at a ratio of ~~1:1 to 2:1 depending on the value of the riparian habitat removed~~ 3:1. ~~A portion of the 1.7 acres to be removed would also constitute wetlands under the jurisdiction of the U.S. Army Corps of Engineers and would be replaced by the wetland replacement mitigation identified under Mitigation 12 below.~~ The 2.5 acres of riparian restoration area along the main creek channel would compensate for the ~~remaining non-wetland~~ riparian habitat to be removed ~~as a result of the project~~ at a 3:1 ratio.

p.127 Revise the fourth full paragraph (item 'd'), second sentence as follows:

> The project proponent would apply for and obtain a Streambed Alteration Agreement from CDFG, a Section 404 permit from the Corps of Engineers, and Section 401 Water Quality Certification from the Regional Water Quantity Control Board

p.128 Revise paragraph one, sentence three as follows:

> In areas ~~that do not support canopy~~ where canopy is absent for a distance of at least 100 feet...

Impact 12

p.135 Revise the first three paragraphs of impact discussion as follows:

> **The project would eliminate approximately ~~1.5~~ 1.2 acres of existing wetlands on the site. (Potential Significant Impact)**
>
> Potential impacts to wetlands include direct modifications to creek channels and seasonal wetlands to accommodate fairways, roadways and golf cart path crossings, and to modify the existing pond.

The development of the project would result in the loss of approximately ~~1.3~~ 1.0 acres of wetland under the jurisdiction of the U.S. Army Corps of Engineers, and an additional 0.2 acres of emergent vegetation along existing ponds. The grading and filling of seasonal stream courses for golf fairways and roadway and golf cart crossings would remove approximately 0.7 acres of watercourses. The excavation of the main stock pond would remove approximately 0.3 acres of these wetlands plus 0.2 acres of surrounding emergent vegetation, although these areas would be converted to storage pond. ~~Approximately~~ The 0.3 acres of ~~the~~ seasonal wetlands in the western portion of the property would ~~be filled for~~ avoided by the construction of the maintenance access road to Watsonville Road.

H. ARCHAEOLOGY

Mitigation 2(b).

p.141 Revise the mitigation statement as follows:

~~Any human remains that are discovered shall be removed, the remains shall be analyzed, a report shall be prepared, and if determined to be Native American, the remains shall be reburied under the direction of a designated Native American group.~~

In the event that human skeletal remains are encountered, the applicant is required by County Ordinance No. B6-18 to immediately notify the County Medical Examiner/Coroner (299-5137). Upon determination by the County Medical Examiner/Coroner that the remains are Native American, the Coroner shall contact the California Native American Heritage Commission, pursuant to subdivision (c) 7050.5 of the Health and Safety Code, and the County Coordinator of Indian Affairs. NO FURTHER DISTURBANCE OF SITE MAY BE MADE EXCEPT AS AUTHORIZED BY THE COUNTY MEDICAL EXAMINER/CORONER. If artifacts are found on the site, a qualified archaeologist shall be contacted, along with full compliance with section B6-19 of the Santa Clara County Code.

J. VISUAL AND AESTHETICS

p.147 Replace "Figure 16" with "Figure 16 (Revised)," on the next page.

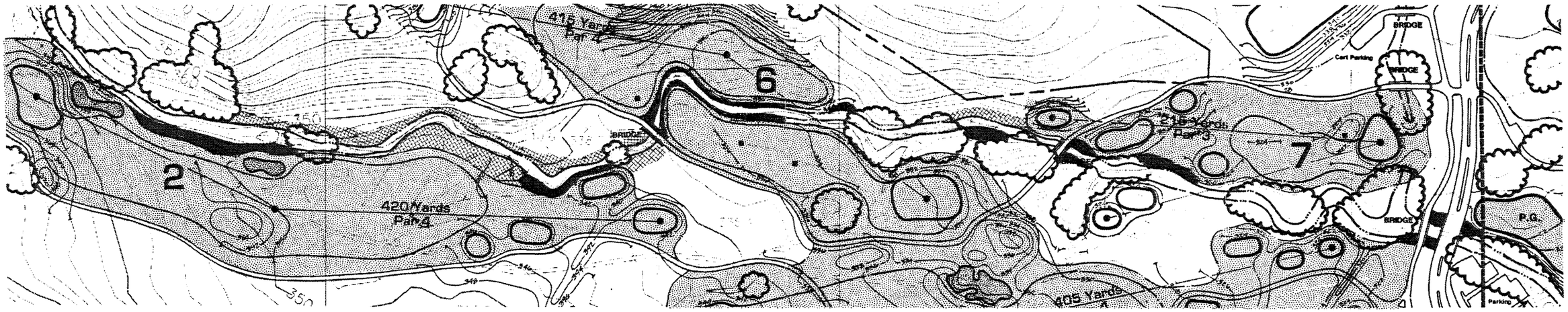
p.135 Revise the fifth paragraph as follows:

Based on the preliminary estimate of ~~1.5~~ 1.2 acres of wetlands affected by the project, it appears that the project may qualify for a General or Nationwide Permit from the Corps.

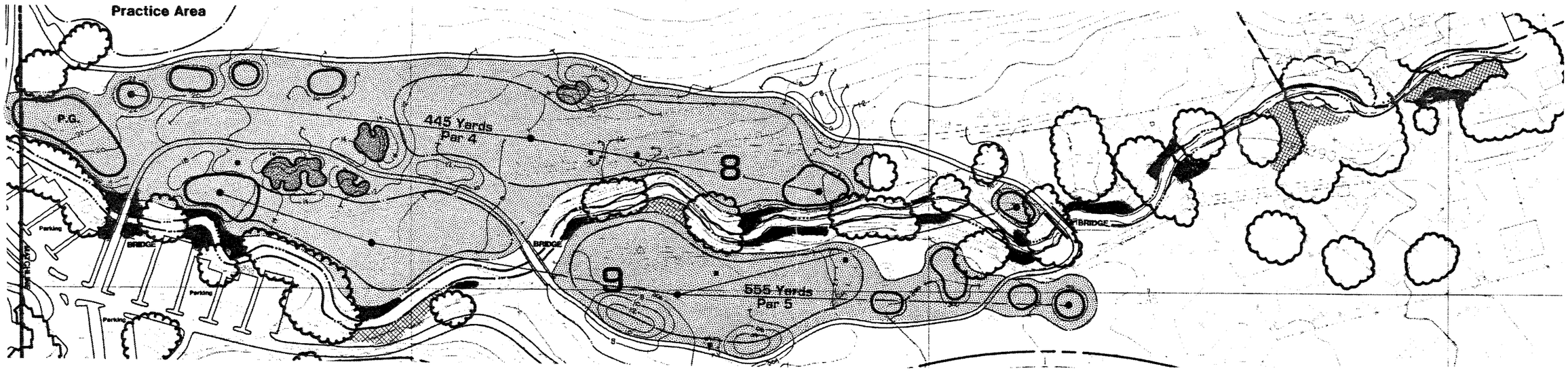
K. TRAFFIC AND CIRCULATION

Background Traffic - Existing plus Approved Projects

p.153 Revise the first paragraph, last sentence as follows:



WESTERN HALF



EASTERN HALF

Location of Tree and Shrub Planting Areas

Trees

Turf and Rough

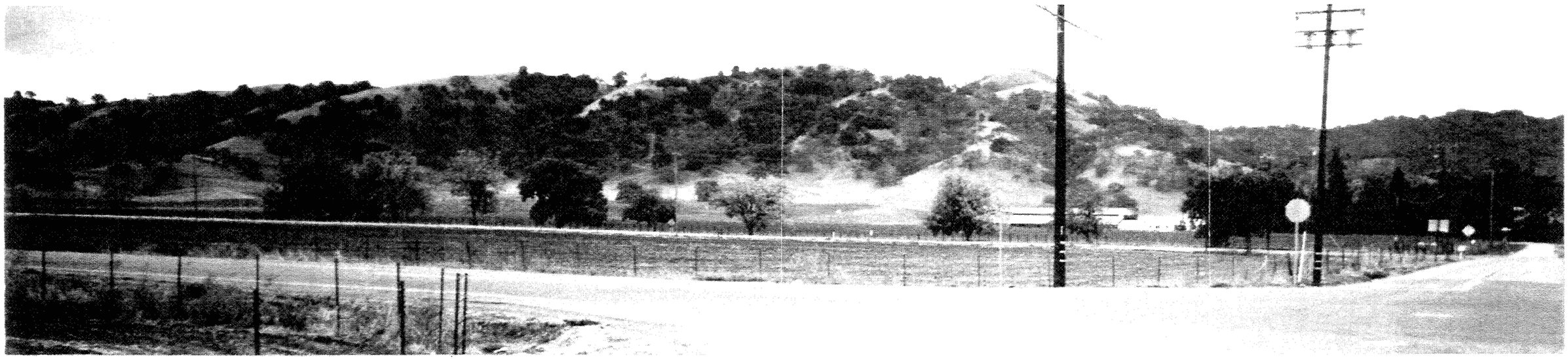
Shrubs

SCALE: 1"= 200'

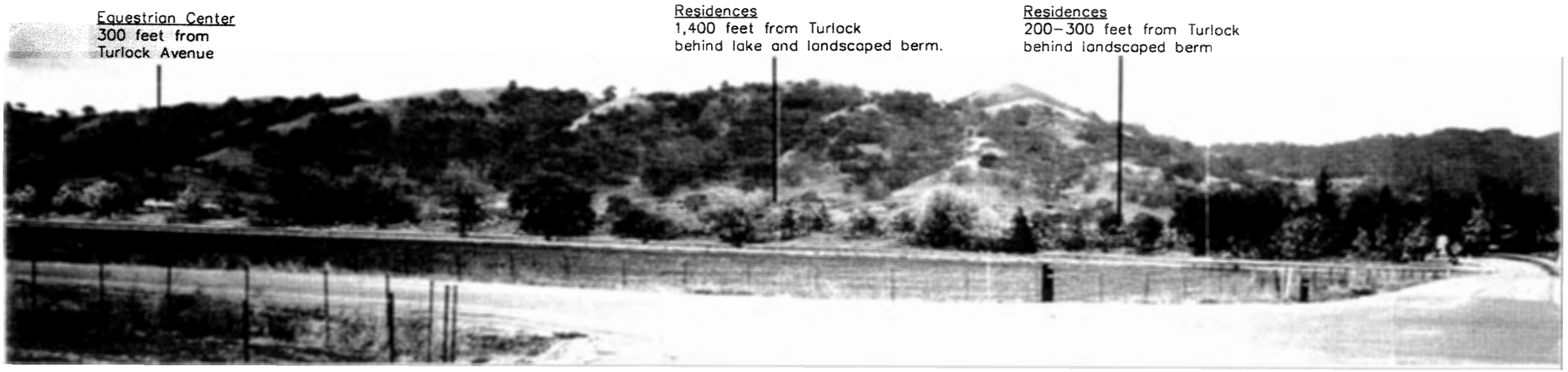
RIPARIAN HABITAT RESTORATION AND ENHANCEMENT CONCEPT

Source: LSA Associates

FIGURE 15 (REVISED)



EXISTING VIEW INTO SITE FROM HIGHLAND / SANTA TERESA INTERSECTION



VIEW WITH PROJECT SUPERIMPOSED

Prepared by Elmore Bohan Design

ARTIST'S RENDERING
FIGURE 16 (REVISED)

Appendix H of this EIR contains a table of these approved projects (Table II), and a figure showing their locations (Figure 3). ~~are contained in Appendix G of this EIR~~

Mitigation 1

p.161 Revise the second paragraph on the page as follows:

Prior to project approval, a drainage plan, which includes calculations prepared by a registered civil engineer...

N. HAZARDOUS MATERIALS, PUBLIC HEALTH AND SAFETY

Impacts and Mitigation

Mitigation 1.

p. 177 Add the following to the second paragraph:

In addition, any removal of the existing above-ground fuel storage tanks would require a permit issued by the Hazardous Materials Compliance Division (HMCD). The tanks may not be moved, even for reuse on the site, without HMCD authorization.

IV. CUMULATIVE IMPACTS

p. 212 Revise the third paragraph as follows:

In terms of land use, the character of ~~this~~ the Morgan Hill - San Martin area is essentially a mixture of urban (or suburban) and rural uses. Therefore, the 16 projects proposed (including the Lion's Gate project) do not represent a fundamental change in the character of the area, individually or collectively, but are incremental additions to the ongoing gradual shift from a rural agricultural to a more ~~urban~~ suburban and rural residential character. (In the immediate vicinity of the Lion's Gate site, this transition has been more of a shift from rural agricultural to rural residential land uses.)

V. ALTERNATIVES TO THE PROPOSED PROJECT

p.219 After the discussion of Alternative D. LOWER DENSITY ALTERNATIVE, add the following paragraphs:

E. AGRICULTURAL PRESERVATION ALTERNATIVE

This alternative reflects a project designed to avoid development of the 110 acres of "Prime Farmland" in the eastern portion of the project site, along Turlock Avenue south of Highland Avenue. This would mean that the 30 residential lots, the 20-acre lake and the equestrian center would not be built in this area. Since this area is currently designated "Agriculture - Medium Scale" in the County General Plan, this alternative assumes a General Plan amendment to

"Hillsides" so that the residential density from this area could be clustered in the interior of the valley. This alternative would require a substantial redesign of the project to accommodate the golf course, the detention storage lake and the residential component within the interior of the valley.

In terms of land use, this alternative would result in an inefficient development pattern with lots dispersed around the golf course. This would also necessitate extensive and costly extension of roadways and infrastructure to serve the scattered residences. As a result, the amount of permanent open space would likely be reduced to accommodate the inefficient development pattern. Since the proposed project contains 282 excess acres of permanent open space beyond that required under the Cluster Ordinance, this should not affect the number of lots permitted under this alternative.

Although this alternative would preserve the existing field west of Turlock Avenue, it is uncertain whether this field would actually be put to agricultural production. As discussed in DEIR Section *III. B. AGRICULTURE*, the start-up costs involved in a new farming operation here would make such an operation marginally economically viable at best, even assuming the most favorable conditions for property taxes and long-term debt. However, this alternative would result in no physical impact to the prime farmland of the site.

Geologically, this alternative would result in a greater level of potential impacts than the proposed project. The 30 dwellings to be moved into the valley and the access road for those lots would be constructed along the hillsides adjacent to the golf course. These areas pose slope stability concerns and are subject to landslides and debris flows from the adjacent hillsides. While these potential impacts could be mitigated, they would be largely avoided in the proposed project.

The potential flooding impacts would be greater for this alternative than for the proposed project. This is because the additional length of roadway needed for access to the dispersed residential lots would increase the overall impervious coverage and thus increase the runoff generated at the site. However, assuming that the flood detention basin or lake could be relocated outside the area of prime farmland and increased in size to accommodate the additional peak flows, these flooding impacts could be mitigated, as they are in the proposed project.

Biologically, this alternative would likely result in greater impacts to special-status species and wetlands than the proposed project. The additional roadways and residential lots in the interior of the site would likely require more filling or piping of streams, and the internal traffic would result in greater potential mortality to California tiger salamanders and western pond turtles. It would also result in greater loss of upland habitat for the tiger salamander and pond turtle. Construction of homesites and the access road along the foot of the southern hillside would also necessitate removal of oak woodland in this area, an impact not associated with the proposed project. Additionally, the introduction of dispersed residential uses into the interior of the site would reduce the general value of the site for wildlife habitat. The presence of human activity, particularly at night when many species are active, would exclude wildlife species which are not adapted to the built environment. In comparison, the proposed project would only involve nighttime activity at the clubhouse and overnight complex, thus confining the human activity to a relatively small area.
Potential impacts to cultural resources would be slightly greater under this alternative, because the greater coverage of the site by development would increase the chances of disturbance to previously undiscovered cultural resource sites.

The potential visual impacts of this alternative would be less than the proposed project, since almost the entire development would be confined to the interior valley and largely out-of-sight.

Although visual impacts are mitigated in the proposed project by a landscaped frontage berm, the presence of the development would be more apparent.

The traffic generated by the alternative would be the same as the proposed project since they would have the same number of dwelling units. However, under this alternative, the internal access road would likely be connected to Watsonville Road to provide through circulation across the site. This would likely result in a greater use of Watsonville Road to gain access to the golf course as well. However, the impacts of such increased traffic along the Watsonville Road would not be significant.

The noise and air quality impacts of this alternative would be similar to those associated with the proposed project, mainly because traffic generation would be about the same. The change in project configuration would not result in new noise or air quality impacts. The clustering of residential uses around the golf course would expose more of the proposed residences to mower noise, but this condition would presumably be accepted by buyers prior to purchase of the residential properties.

The potential exposure to hazardous materials and electromagnetic fields would be the same under the alternative and the proposed project, since the potential impacts would be fully mitigated or readily avoided in both cases.

The demand for water supply, wastewater treatment, utilities and public services would be the same under the alternative and the proposed project, except that the alternative would require longer extensions of pipeline and utility lines to reach the dispersed residences. Likewise, response times for emergency services would be longer for the dwellings located in the interior of the valley.

In summary, the Agricultural Preservation Alternative would result in lower levels of impact in terms of agricultural land conversion and visual impacts, but would result in greater impacts in terms of geologic hazards, cultural resources and particularly biological resources than the proposed project. Thus, although this alternative would achieve the policy objective of agricultural land preservation, in other respects it would not represent an environmentally preferable alternative to the proposed project.

F. NO GOLF COURSE ALTERNATIVE

This alternative would be similar to the proposed project except that it would not include the golf course component. Thus the 263 acres of the golf course would be included in the Hillside cluster area, which would result in an additional 13 lots, for a total of 54 lots. It is assumed that these additional lots would be developed within the area proposed for the golf course, and that all other aspects of this alternative would be the same as the proposed project.

In terms of land use, this alternative would be no more or less compatible with adjacent uses than the proposed project, with no difference in impacts.
In terms of agricultural land conversion, this alternative would have essentially the same footprint as the proposed project, with no difference in impacts.

Geologically, this alternative would encounter the same concerns as the proposed project; however, all potential impacts could be mitigated or avoided in both cases.

Potential flooding impacts would be approximately the same for this alternative as for the proposed project. The impervious surface coverage by the 13 additional dwellings and the more extensive roadway required would be about the same or slightly greater than the coverage of the golf course facilities. Although the residential alternative would not include the absorbent turgrass and retention basins of the golf course, sufficient land area would exist to create additional detention facilities for the increased peak runoff from added residential lots if needed.

In terms of water quality, this alternative could result in greater impacts than the proposed project. Without the golf course component, a package treatment plant would not be justified, necessitating individual septic and leachfield systems for each residential lot. The potential for groundwater contamination from such individual leachfields would be significantly greater than for the proposed package treatment plant. Although the elimination of the golf course would remove the threat of water contamination from pesticides and fertilizers, in fact this risk would be avoided in the proposed project by the comprehensive environmental management plan and water quality monitoring program which would ensure that water quality impacts would not occur.

Biologically, this alternative would result in approximately the same overall impacts as the proposed project. It is assumed that the 13 additional residential lots could be clustered to avoid impacts to the habitat of the California tiger salamander and the western pond turtle, and would result in lower levels of impact to wetlands and riparian habitat. However, these impacts would be mitigated in the proposed project. Additionally, the introduction of dispersed residential uses into the interior of the site would reduce the general value of the site for wildlife habitat. The presence of human activity, particularly at night when many species are active, would exclude wildlife species which are not adapted to the built environment. In comparison, the proposed project would only involve nighttime activity at the clubhouse and overnight complex, thus confining the human activity to a relatively small area.

In terms of cultural resources and visual impacts, there would be no difference in impacts between this alternative and the proposed project.

The traffic generated by this alternative would be somewhat lower than the proposed project. However, no significant impacts would occur in either case. The corresponding reductions in noise and air emissions would likewise not be significant.

The potential exposure to hazardous materials and electromagnetic fields would be the same under the alternative and the proposed project, since the potential impacts would be fully mitigated or readily avoided in both cases.

The water consumption associated with this alternative would be substantially less than the proposed project, since no golf course irrigation would be involved. However, any potential impacts associated with water consumption in the proposed project would be avoided.

In summary, the No Golf Course Alternative would result in similar levels of potential impact to the proposed project, except that the alternative would likely result in greater water quality impacts, and would involve substantially less water consumption. As such, this alternative would not represent a clearly environmentally superior alternative to the proposed project.

p.219 Revise the second section heading on the page as follows:

~~E.~~G. ALTERNATIVE PROJECT LOCATION

P.222 Revise the second paragraph as follows:

~~F.~~H. SUMMARY - ENVIRONMENTALLY SUPERIOR ALTERNATIVE

Of the 5 7 project alternatives considered above, ~~all but 2~~ 3 alternatives would result in generally greater levels of impact, and 4 alternatives would result in generally the same levels of impact ~~than~~ as the proposed project. ~~as proposed.~~ The alternatives with greater impacts include the No General Plan Amendment Alternative, the Higher Density Residential Alternative and the Alternative Project Location in Coyote Valley. Of the remaining ~~two~~ four alternatives, the Lower Residential Density Alternative, the Agricultural Preservation Alternative and the No Golf Course Alternative would result in slightly lower levels or impact in some categories, but the differences would not be substantial...

VI. REVISIONS TO THE APPENDICES OF THE DEIR

APPENDIX B

Add the following addendum letter from Dr. James A. Niles (see next page).

May 23, 1996

Mr. Bert Verrips
Nolte & Associates
60 South Market Street
San Jose, CA 95113

Dear Mr. Verrips,

RE: Economic Analysis of Agricultural Operations--addendum
Lion's Gate Reserve EIR

Clarification of Modeling Analysis

It is unrealistic to assume that new agricultural enterprises could be undertaken without incurring new debt. The assumption made in the analysis was that the operation started as a family operation free of any long term debt (ie. no mortgage on the property). However, financing would be needed and capital costs were included to finance the startup of new enterprises to include the developmental expenditures such as the costs of land preparation, cost of trees, cost of planting. Included was the carrying cost of the operation until positive cash flow could be generated, reflecting the time lag from planting until harvesting. Existing operations free of any debt are in a completely different position from startup activities. Therefore, the mentioned walnut farm in the San Joaquin Valley which is free from any debt can be profitable while a new walnut operation on the subject property would not be economically viable.

Analysis of Vineyard Alternatives

The supply and demand situation for wine grapes is very favorable at this point in time, suggesting that vineyard might be an alternative to be considered. Table 1 shows salient grape statistics for Santa Clara County since 1970. Harvested acreage has declined from approximately 2500 acres to 1500 acres. Average price per ton has shown an upward trend during the period with considerable variations in yield. The 1970-1974

Table 1. Grape Statistics for Santa Clara County, 1970-1994.

YEAR	HARVESTED ACREAGE	TONS PER ACRE	TOTAL PRODUCTION	PRICE PER TON	TOTAL VALUE
1970	2603	3.65	9,500	$240	$2,280,000
1971	2500	4.64	11,600	$330	$3,828,000
1972	2650	3.71	9,800	$500	$4,900,000
1973	2405	5.36	12,900	$500	$6,450,000
1974	2390	3.56	8,500	$220	$1,870,000
1975	2334	3.33	7,770	$205	$1,593,000
1976	2155	3.30	7,110	$215	$1,529,000
1977	2186	2.46	5,380	$425	$2,286,000
1978	2072	2.66	5,510	$535	$2,948,000
1979	2010	3.00	6,030	$455	$2,744,000
1980	1716	3.00	5,150	$460	$2,369,000
1981	1423	2.25	3,200	$485	$1,552,000
1982	1732	3.00	5,195	$400	$2,078,000
1983	1645	2.00	3,290	$350	$1,152,000
1984	1560	2.50	3,900	$300	$1,170,000
1985	1525	3.00	4,575	$310	$1,418,000
1986	1600	3.00	4,800	$400	$1,920,000
1987	1570	2.00	3,140	$415	$1,303,000
1988	1500	2.50	3,750	$500	$1,875,000
1989	1500	2.75	4,125	$525	$2,166,000
1990	1550	2.50	3,875	$555	$2,151,000
1991	1475	2.50	3,688	$570	$2,102,000
1992	1430	2.50	3,575	$690	$2,467,000
1993	1455	2.75	4,001	$665	$2,661,000
1994	1535	2.50	3,838	$760	$2,917,000

Source: County of Santa Clara, Santa Clara County Agriculture Report, Various reports, 1971-1994, Department of Agriculture.

average yield was 4.18 ton per acre versus a 1990-1994 average yield of 2.55 tons per acre.

Vineyard Alternative

A ten year time horizon analysis of a vineyard was completed to evaluate the proposal of planting a vineyard on the subject property. Key assumptions were:

400 acres of vineyard planted
8' X 6' spacing = 908 vines per acre
Trellis system with drip irrigation
Projected yield of 3 tons per acre in year 3, 5 tons per acre thereafter
Cultural and harvesting costs of $2,000/acre/year

Industry sources supported a projected price of $800 per ton over the 10 year period. The supply and demand situation is currently very tight, but the present high prices are not expected to be sustained over the 10 year time horizon. Wine analyst Jon Fredrikson, president of Gomberg, Fredrikson and Associates of San Francisco, commenting at a recent presentation in Visalia, pointed out the tremendous expansion of wine grape vineyards in the state and the effect on damping price prospects. "Knowing growers, we are likely to produce more grapes than we could possible use by 2000. Nevertheless, I am bullish on demand, and I hope demand will keep pace with all the grapes being planted."

The analysis of a proposed vineyard showed significant capital expenditures necessary to establish the vineyard. The development costs prior to producing the first crop in the third year totaled $5.74 million or $14,350 per acre without any land purchase cost. These costs were primarily land preparation costs, cost of vines, costs of planting, trellis and irrigation systems and care of the young vines. Financing costs were included because of the high start-up costs.[1] After the fourth year, with the operation past the start-up phase, annual income exceeded annual cultural and harvesting costs. However, at the end of the 10th year, the net accumulated position was a negative $3.7 million because of the high start-up costs.

Sensitivity analysis showed if the price level was $1,000 per ton, it would be after the end of the tenth year before the accumulated net position became positive. At a price of $1200 per ton, it would be at the end of eighth year before accumulated income exceeded accumulated expenses.

[1] Without financing costs, the development costs would still be $12,875 per acre.

Conclusion

While the annual income exceeds the annual cultural and harvesting cost for the modeled vineyard, the inclusion of startup and financing costs create an enterprise that is not financially advisable. The planting of 400 acres of wine grapes which would be a 26% increase in the county's grape acreage is not justified given the projected returns from the enterprise, the opportunity cost of capital and the uncertainty and risk of the operation.

Respectfully,

James A. Niles

James A. Niles, Ph.D.

APPENDIX F

Add the following letter from H.T. Harvey and Associates.

H.T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS

June 19, 1996

Bert Verripes
Nolte and Associates
60 South Market Street
San Jose, CA 95113

Subject: Riparian Habitat Impact Assessment at Lion's Gate Golf Course

Dear Bert,

You recently asked H.T. Harvey and Associates to reassess impacts to riparian habitat at the Lion's Gate Golf Course. Impacts were initially assessed by H.T. Harvey and Associates for the project's E.I.R. using an aerial photograph and site development plans provided by the project proponent. H.T. Harvey and Associates concluded that 1.7 acres of riparian vegetation would be removed and 0.4 acres would become "non-riparian" due to either diversion of creek flows or filling of creek channels for a total of 2.1 acres of riparian impacts. On June 14, 1996 Pat Reynolds of H.T. Harvey and Associates reevaluated impacts to riparian habitat in the field with Ron Davis of Lion's Gate Reserve.

Impacts to riparian habitat have been significantly reduced by golf course redesign and more precise measurements for the following reasons:

1. The orientation of golf course fairways were modified to avoid impacts.
2. Many dewatering impacts were eliminated by maintaining creek flows and avoiding filling of channels.
3. Impact assessment accuracy was improved with more precise measurements of riparian canopies in the field which was not possible using the aerial photograph.
4. One group of trees which appeared to be riparian on the aerial photograph was found to be in upland habitat when examined in the field.

The impact to riparian vegetation is now 0.50 acres of vegetation removal and 0.33 acres of channel dewatering for a total of 0.83 acres of impacts. Table 1 lists the species and diameters of all the riparian trees that will be removed or impacted from dewatering. Please call myself or Pat Reynolds if you have any questions.

Sincerely,

Patrick Reynolds For

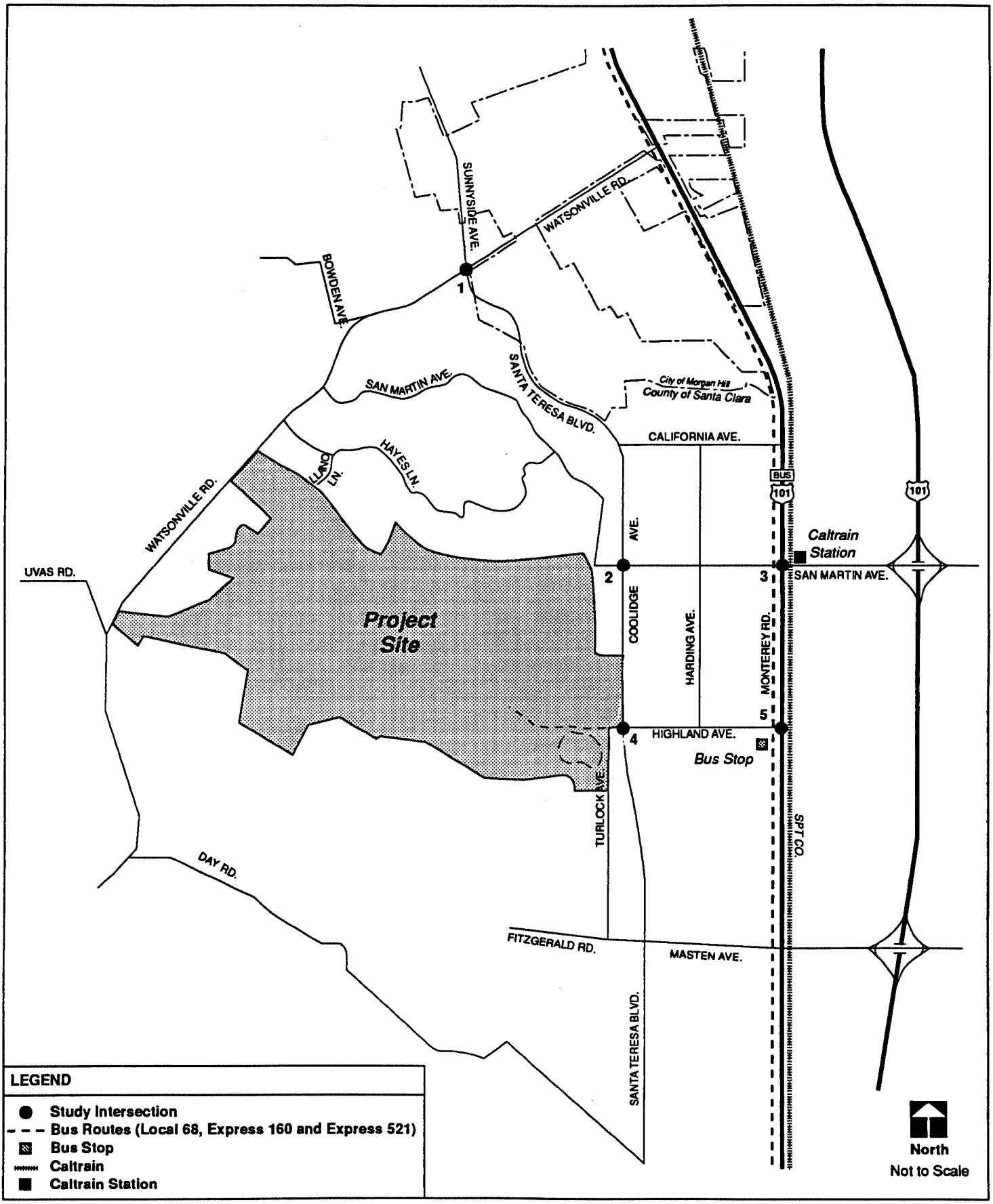
Rick Hopkins

☑ Alviso Office
906 Elizabeth Street • P.O. Box 1180
Alviso, CA 95002 • 408-263-1814 • Fax: 408-263-3823

☐ Fresno Office
423 West Fallbrook, Suite 207
Fresno, CA 93711 • 209-449-1423 • Fax: 209-449-8248

APPENDIX H

Add the following figures to Appendix H.



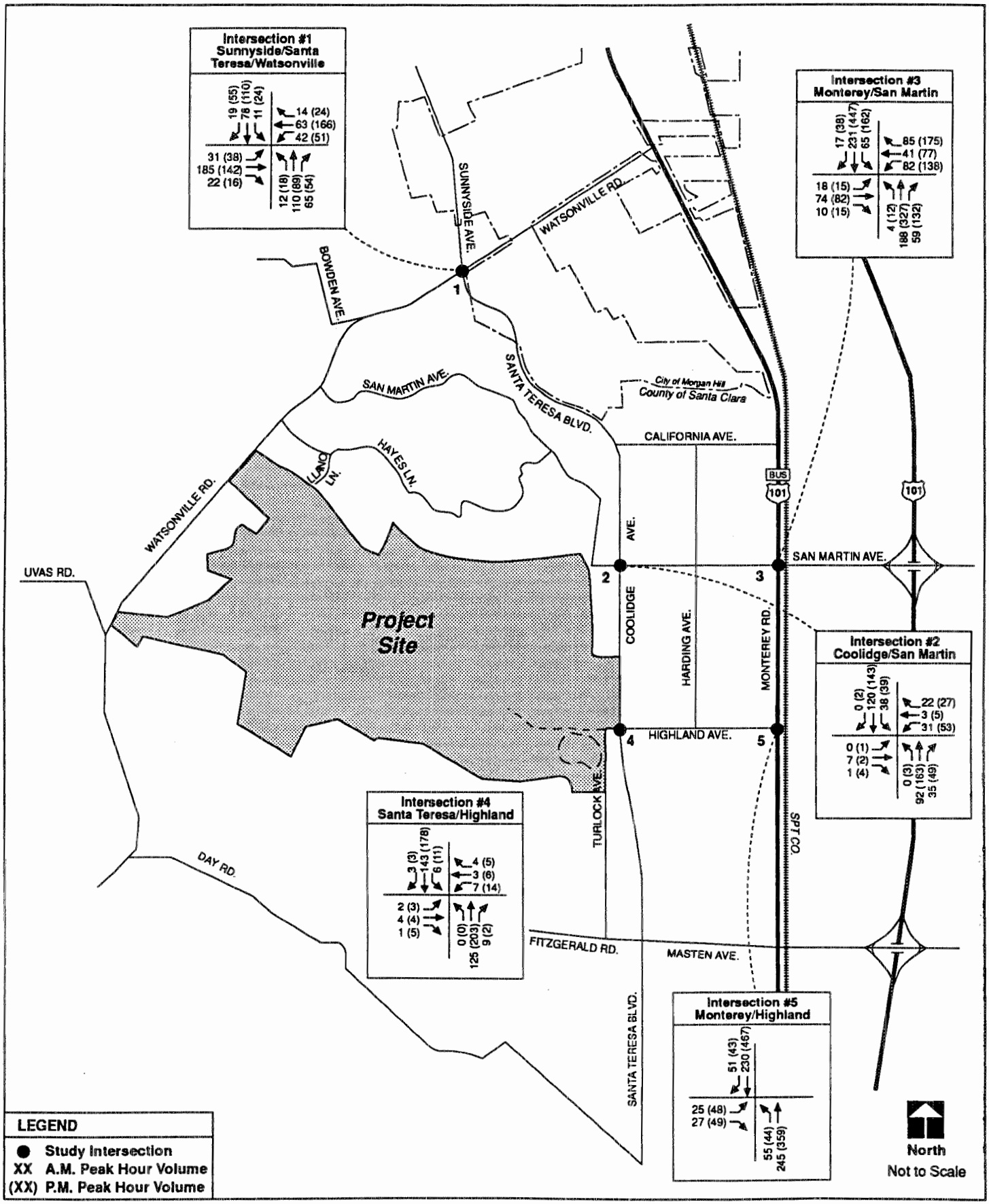
Santa Clara County
Hayes Valley TIS

Vicinity Map

Figure 1

TJKM

142-026 - 4/94 - K2



Santa Clara County
Hayes Valley TIS

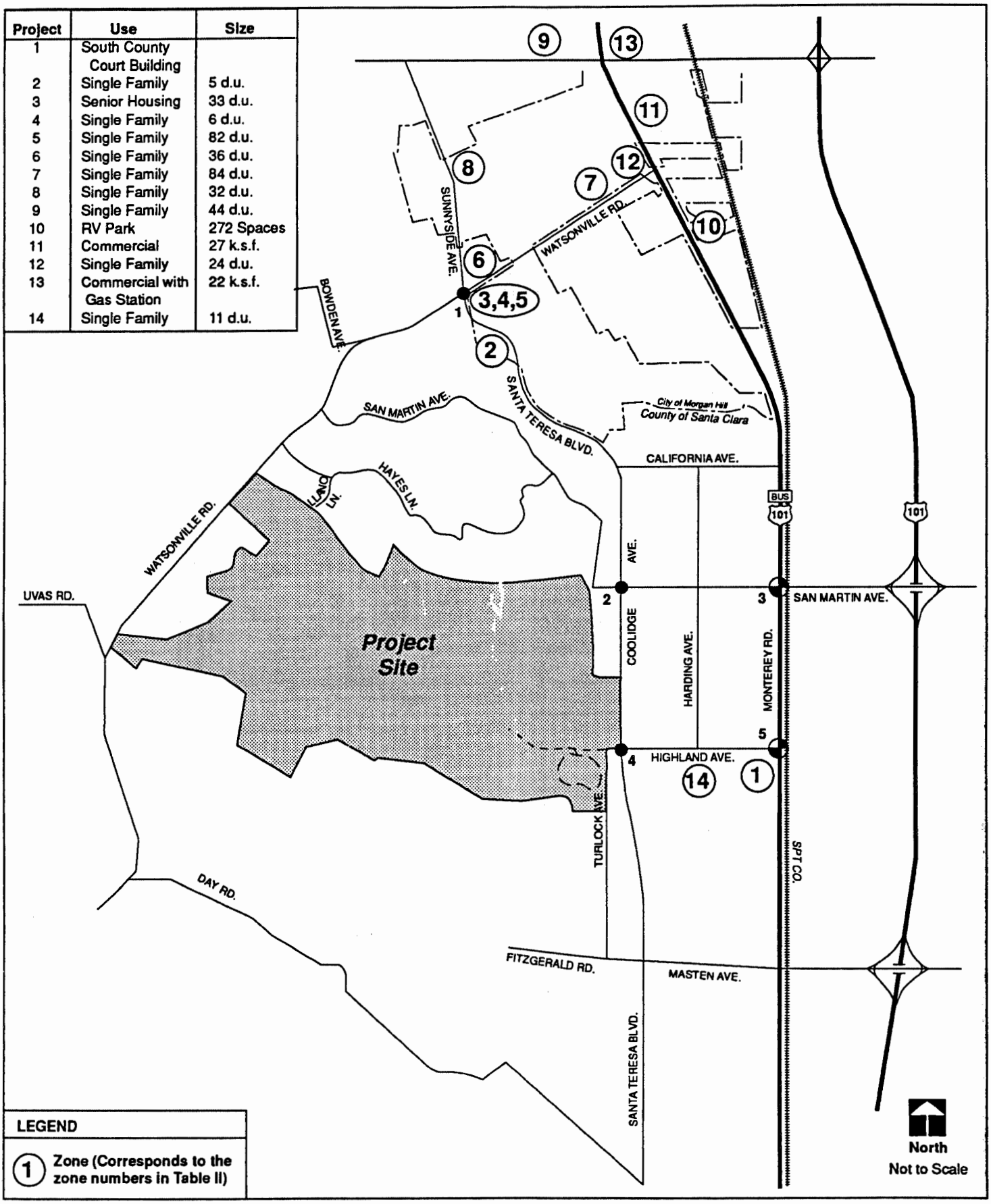
Existing Peak Hour Turning Movements

Figure 2

TJKM

142-026 - 4/94 - K2

Project	Use	Size
1	South County Court Building	
2	Single Family	5 d.u.
3	Senior Housing	33 d.u.
4	Single Family	6 d.u.
5	Single Family	82 d.u.
6	Single Family	36 d.u.
7	Single Family	84 d.u.
8	Single Family	32 d.u.
9	Single Family	44 d.u.
10	RV Park	272 Spaces
11	Commercial	27 k.s.f.
12	Single Family	24 d.u.
13	Commercial with Gas Station	22 k.s.f.
14	Single Family	11 d.u.



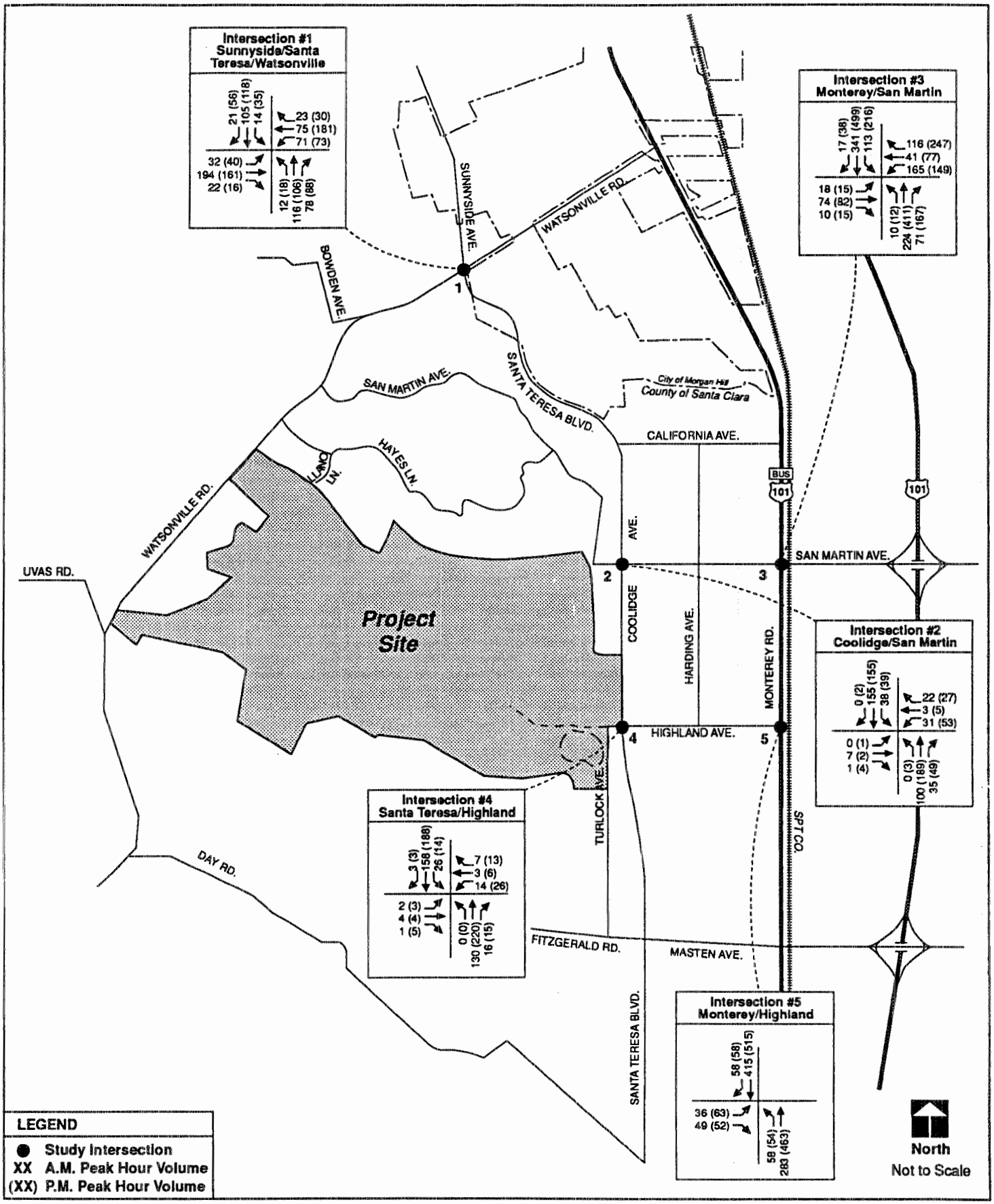
Santa Clara County
Hayes Valley TIS

Figure 3

Location of Approved Developments

TJKM

142-026 - 4/95 - K2

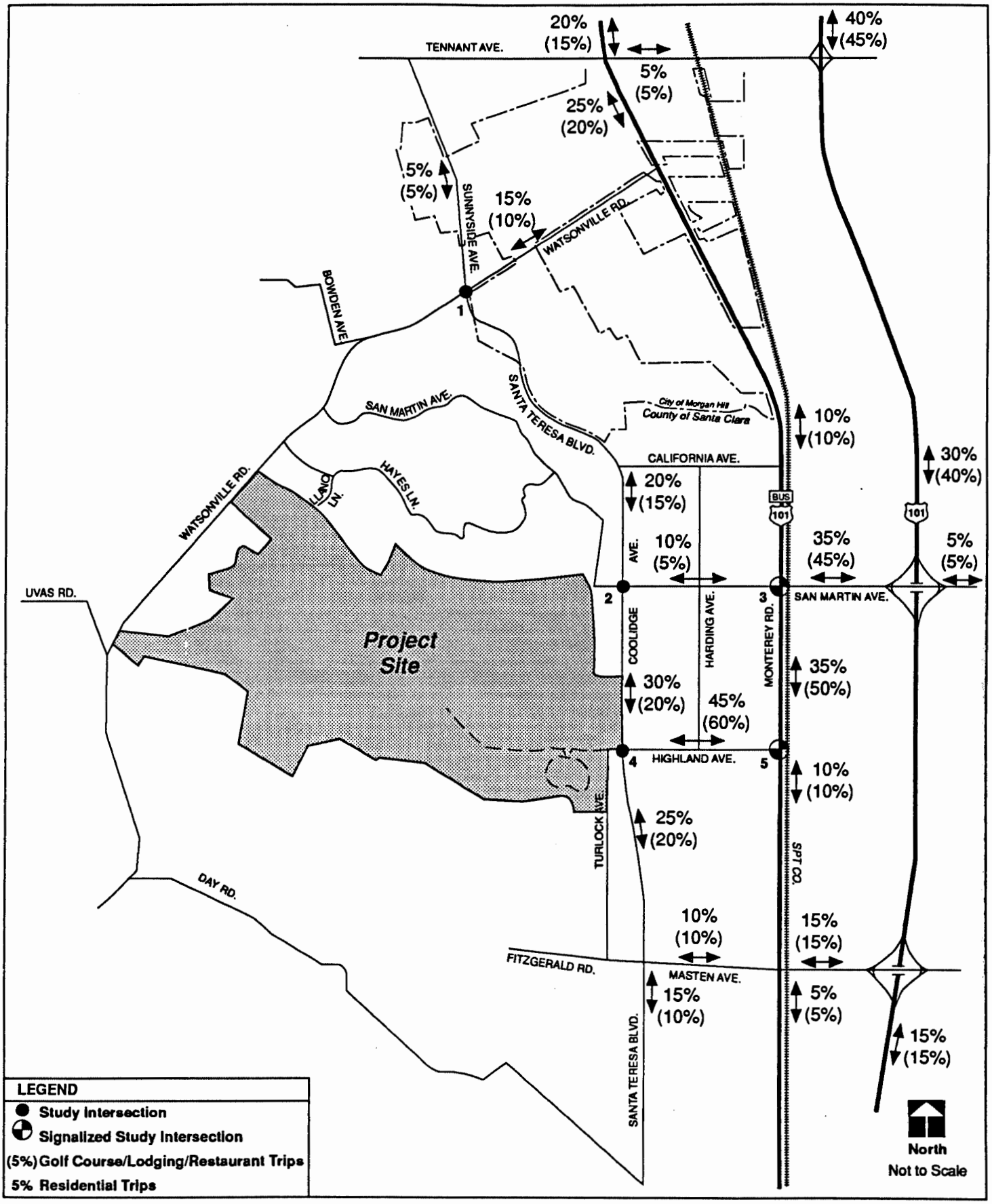


Santa Clara County
Hayes Valley TIS

Figure 4

Existing plus Approved Peak Hour Turning Movements

142-026 - 4/95 - K2



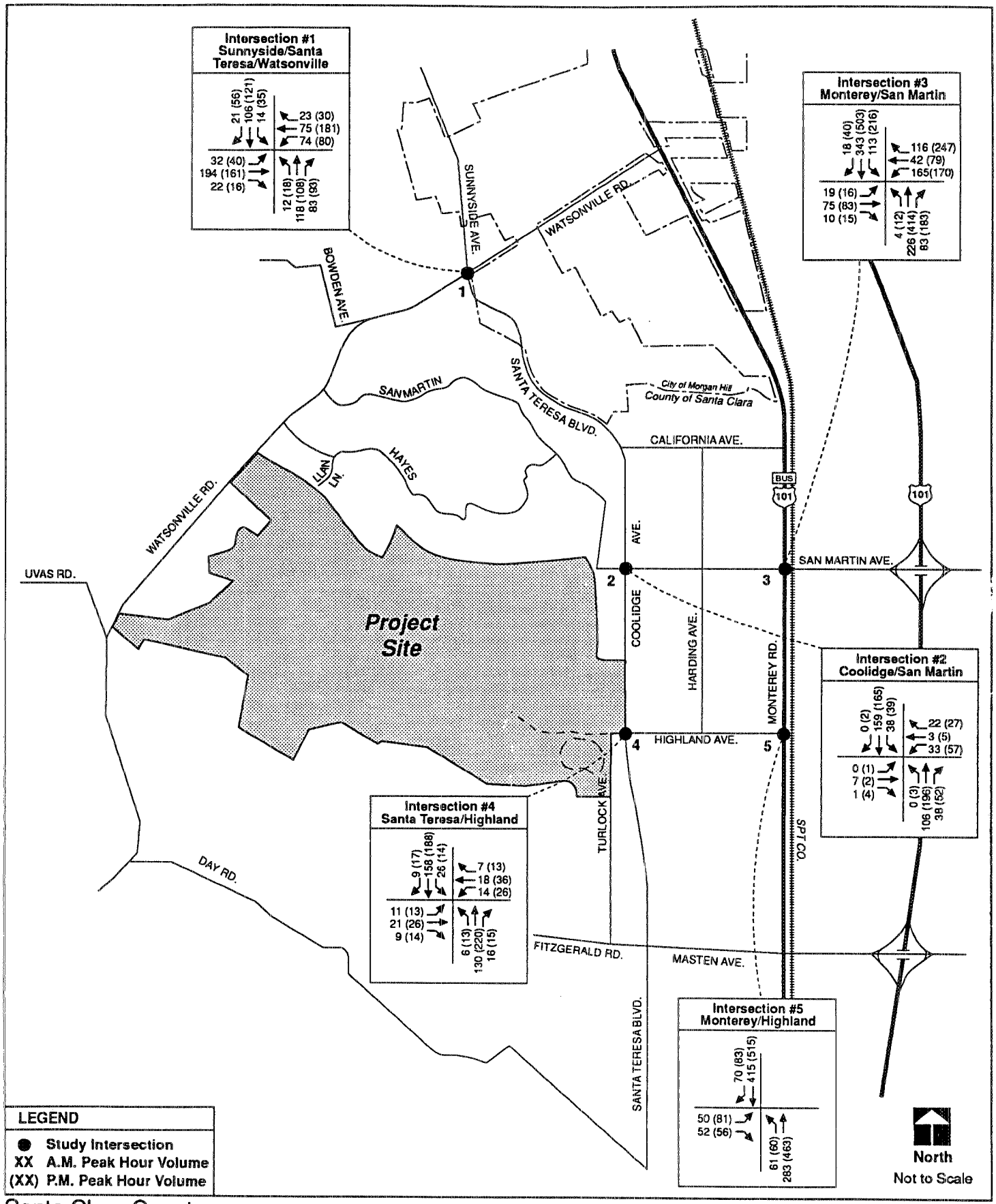
Santa Clara County
Hayes Valley TIS

Trip Distribution

Figure 6

TJKM

142-026 - 4/94 - K2

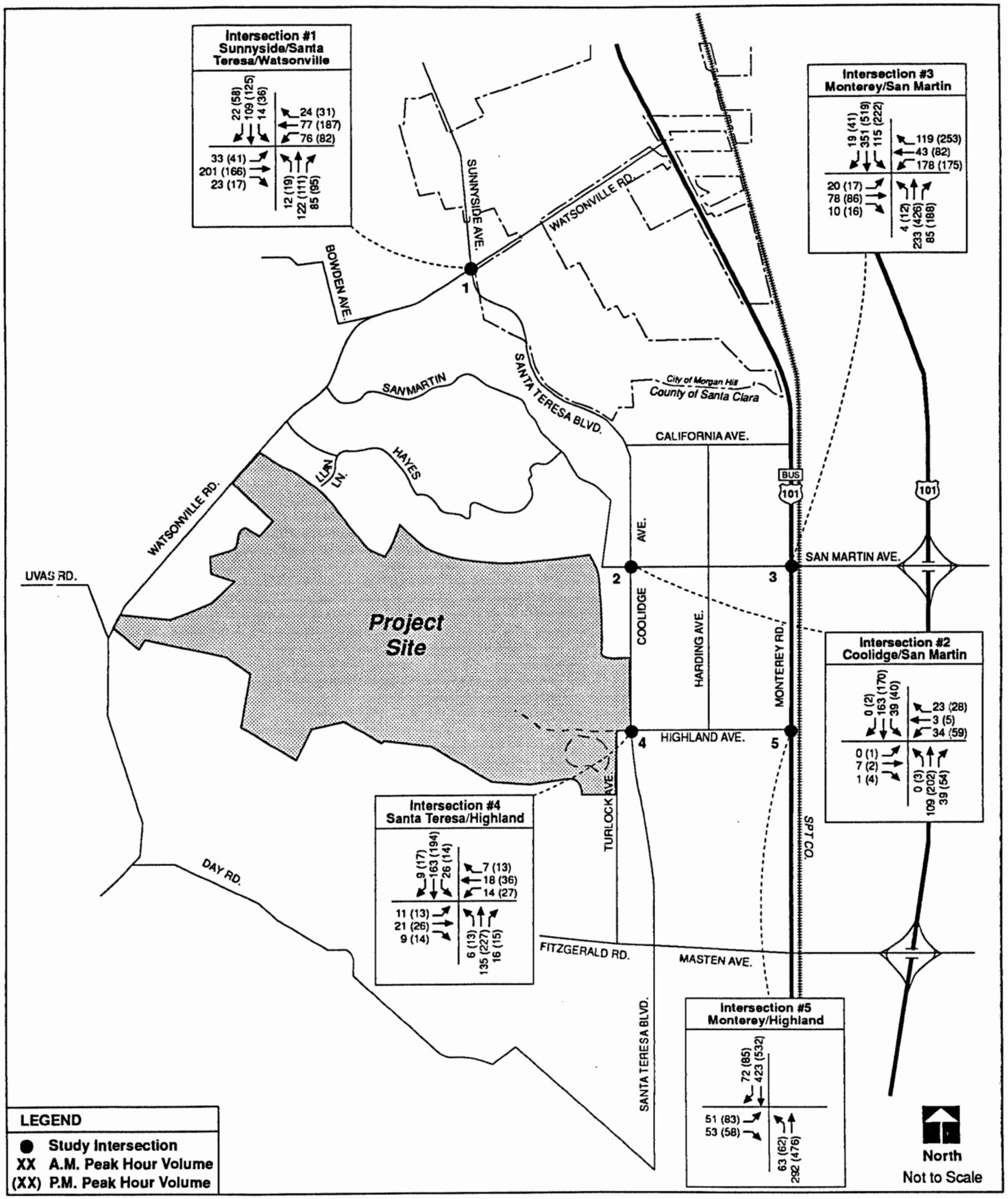


Santa Clara County
Hayes Valley TIS

Existing plus Approved plus Project Peak Hour Turning Movements

Figure **7**

142-026 - 9/95 - K2



Santa Clara County
Hayes Valley TIS

Existing plus Approved plus Project plus Expected Growth Peak Hour Turning Movements

Figure **8**

TJKM

APPENDIX M

Add the following addendum letters from Geoconsultants, Inc., and West San Martin Water Works and the memo from the Santa Clara Valley Water District.

GEOCONSULTANTS, INC.
Hydrogeology • Ground-Water Exploration & Development •
Ground-Water Resources Management •
1450 Koll Circle, Suite 114
San Jose, California 95112
Phone: (408) 453-2541 Fax: (408) 453-2543

May 28, 1996
Project No. G1022-01B

Mr. Tom Hix
Hayes Valley Development Partners
405 El Camino Real, Suite 127
Menlo Park, CA 94025

RE: HYDROGEOLOGIC SERVICES
LION'S GATE RESERVE
SANTA CLARA COUNTY, CALIFORNIA

Dear Mr. Hix:

In order to address in detail the on-site hydrogeologic characteristics, the following scope of work will be completed:

Initially a 24-hour aquifer test will be performed on one of the existing wells on the property. Static water levels will be measured in the pumping well, as well as a monitoring network of at least one on-site and one off-site well. Drawdown and recovery levels will be recorded on all wells during the pumping test. Based on the results of the aquifer test, calculations of transmissivity, specific capacity, and storitivity will be prepared. This information will allow us to determine the maximum radius of pumping influence. Once this has been established, a setback line can be drawn so that new on-site production wells will not impact existing off-site wells.

Once the setback line has been established, an on-site survey for the purpose of locating one or more on-site production wells will be performed. Based on the results of this survey, one or more production wells will be constructed, and the water-bearing characteristics of the formations penetrated evaluated.

A 72-hour pumping test to determine well production parameters such as specific capacity and recommended pumping rates will be performed following construction. At the conclusion of the test, we will collect a water sample for an evaluation of constituents in accordance with State and County drinking water standards.

A monitoring well network will be developed including the production well(s), other on-site wells, and appropriate off-site wells. In order to develop a water level history, measurements will be taken in each of the wells for an extended period of time. Individual well hydrographs will be developed. In addition, a precipitation gage will be installed at the site in order to develop accurate rainfall totals. This information will allow periodic updates of the aquifer characteristics, and assure that an overdraft condition will not occur.

We appreciate the opportunity to present this work program to you for this project. Please call me with any questions or comments.

Sincerely,

GEOCONSULTANTS, INC

John K. Hofer
Engineering Geologist, EG-1065

JKH:rls

(G1022pro.DOC)

WEST SAN MARTIN WATER WORKS, INC.

1005 HIGHLAND AVE. • SAN MARTIN, CALIFORNIA 95046 • 408-683-2098

June 7, 1996

Mr. Thomas Hix
Hayes Valley Development Partners
405 El Camino Real #127
Menlo Park, California 94025

Re: Lion's Gate Reserve Project

Dear Tom;

This letter shall serve to confirm the following discussion that we had regarding the water rates for the project and the status of the tank.

As we discussed, and attached hereto is a copy of the Bulk rate which West San Martin Water Works is allowed to charge for large users per our P.U.C. Tariff Schedule No. 6R. This Tariff Schedule allows us to sell water at $ 0.57 per 100 cubic feet to Lion's Gate for golf course irrigation. This rate is approximately 60 to 65 per cent less than the rate we charge for general customer service per our Tariff Schedule No. 1, which is currently $ 1.36 per 100 cubic feet for the first 300 cubic feet and $ 1.61 per 100 cubic feet over 300 cubic feet of water.

As we discussed, WSMWW has more than sufficient capacity in our existing wells to accommodate any water needs the golf course may have. It is my understanding that you will use ground water from the site as your primary source for golf course irrigation, and supplement the needs from both WSMWW and Twin Valley so that you do not draw more than a safe yield from your own aquifer. Based on this approach, I see absolutely no problem in satisfying your water demands.

With respect to the new storage tank, WSMWW is currently in the engineering design phase and we expect to commence construction in the spring of 1997. The tank will be fully operational prior to the spring of 1998, which is when we understand that the Lion's Gate project will be completed.

Please feel free to call upon me if I can be of any further assistance.

Sincerely,

Bob Ukestad

Bob Ukestad, Manager
West San Martin Water Works, Inc.

TRANSMITTER USE ONLY
☐ Sent
SB Initials
6/27 Date
115 Time

Santa Clara Valley Water District
5750 Almaden Expressway, San Jose, CA 95118, (408) 265-2600

FAX NUMBER: (408) 266-0271

FAX TRANSMISSION

PLEASE NOTE: If the same FAX transmission is being sent to more than one company and/or agency, please provide required information.

Date: 6/27/96

TO	COMPANY OR AGENCY	FAX NUMBER
Bert Verrips	Noite & Assocs	267-6906
		298-2719
Hugh Graham	S.C. County Planning	279-8537

From: Sue Tippets

REFERENCE:

Project #:	Total Pages (Including Coversheet):	☐ Original will follow by:
	3	

MESSAGE:

Disk: Miscellaneous - 5; EIRs (black)
filename: \eir\hayes-3.wpd
Word Perfect for Windows 6.0

June 26, 1996

To: Sue Tippets
From: Seena Hoose
Subject: Lion's Gate Development in Hayes Valley, Sustainable Water Supply

My analysis used the quantities included in the EIR and related documents provided to me by the project proponents, confidential information available through the District's well section and drilling logs, the District's depth to water program, and the 1973 Wahler report on Hayes Valley as a potential reservoir site.

The plan proposes to obtain water from three sources, 1) on-site groundwater, 2) Twin Valley Inc., and 3) West San Martin Water Works, Inc.

The demand projection is 410.8 acre-feet per year, of which 374.1 acre-feet are for golf course irrigation. However, the majority of that demand will occur during the summer, assuming 150 days at the peak demand rate the project will use 363.9 acre-feet during the 5 summer months.

The estimated availability of on-site groundwater is 313 acre-feet a year. This leaves an annual shortage of 97.8 acre-feet. Project proponents plan to augment the on-site groundwater from Twin Valley and West San Martin. First I will examine the on-site supply and the effects of it's use, then the other two water sources.

On-site Groundwater

The Hayes Valley aquifer is within the alluvium filling the valley floor. The assumption was made that the average saturated thickness of the aquifer is 50 feet. The 1973 Wahler report indicates that the bedrock beneath the alluvium is a very irregular surface. Thus, the groundwater will be compartmentalized and it may be very difficult to obtain the proposed yield because of boundary effects and drawdown problems within the wells. The faults crossing the valley floor may also operate as barriers to groundwater movement to wells. Therefore, although the generalized assumptions were conservative, the on-site groundwater may not be fully available, particularly during the summer period of peak golf course watering.

The Hayes Valley aquifer materials are directly connected to the Llagas groundwater basin at the eastern end of the valley. At the present time Hayes Valley groundwater naturally migrates into the Llagas basin. There are over 45 wells, mostly private, within about 4,000 feet of the end of Hayes Valley. The Llagas groundwater basin appears to be relatively shallow, about 200 feet thick, in that area. The groundwater use on-site will significantly reduce the amount of water migrating from Hayes Valley into the Llagas basin. The possibility exists that this could compound declines in water levels due to pumping, particularly during drought conditions.

Project proponents have stated that they will monitor groundwater levels. They have also indicated that during drought conditions they will significantly curtail water use, particularly at the golf course.

The groundwater close to the west side of the Llagas basin, and in the vicinity of Hayes Valley has been impacted by nitrate contamination. The water quality in this part of the groundwater basin needs to be monitored to verify that the reduction of inflow from Hayes Valley groundwater does not have an adverse impact.

Twin Valley, Inc.

The available water from Twin Valley, Inc. is estimated at 16 acre-feet per year. The water is taken from the mountain valley alluvial aquifer along Hayes Creek at the north edge of Hayes Valley. The wells are in the general vicinity of Watsonville Road and Sycamore Road. This groundwater is contaminated with nitrate. Twin Valley has installed 2 new wells. One well, in serpentine bedrock yields 30 gpm. The other well log has not yet been submitted to the District as legally required. Until the new operations are established, and the impacts upon this very limited aquifer are known, it is best not to rely on this source of water. There are over 60 private wells in the immediate vicinity of the project.

West San Martin Water Works, Inc.

The conservative estimate indicated an availability of 599 acre feet as inflow from other parts of the Llagas groundwater basin, and 184 acre-feet from rainfall recharge. The West San Martin wells are located in downtown San Martin and near Llagas Creek. West San Martin Water Works is supplying about 235 acre-feet annually to their current customers. It does appear that they will be able to supply the additional 100 to 200 acre-feet annually needed for the project. It remains important that water for the project be piped from near the center of the valley and not be drawn from groundwater along the west side of the Llagas groundwater basin.

General Information

The District projects identified in the EIR are not going to be constructed. In particular, it was determined that the location at Maple Avenue is not suitable for recharge ponds.

SEE NEXT PAGE

During discussion with the Project EIR writer we identified that the EIR had not listed a rare mineral occurrence on the property. POPPY JASPER has been quarried on the Hayes Valley Ranch. The Poppy Jasper locality in one of only two known occurrences in the world. The mineral locality should be identified and protected during and after development of the site.

Tom Iwamura suggested the consideration of a Special Pump Tax Zone because the groundwater is being pumped from the basin and used in an upland area. There is precedent for this in other projects, such as United Technologies Corporation which pumps water from the Coyote valley and brings it over the mountain to their site.

Note from EIR Preparer regarding Poppy Jasper

The preceding memo from the Santa Clara Valley Water District makes a reference, at page 2, to Poppy Jasper being present on the property. In response, local geologist Peter Anderson of Pacific Geotechnical Engineering was consulted regarding this issue. Mr. Anderson stated it was unlikely that the deposit was located within the present boundaries of the site. However, there is strong reason to believe that the source is present within the Hayes Ranch estates development, which is adjacent to the Lion's Gate site to the north.

ADDENDUM TO

ENVIRONMENTAL IMPACT REPORT

LION'S GATE RESERVE

LEAD AGENCY: COUNTY OF SANTA CLARA

File #4039-67-28-93
SCH #94043016

DECEMBER 1996

PREFACE / INTRODUCTION

Overview of Project Modifications

This EIR Addendum has been prepared to address the changes to the Lion's Gate Reserve project that have been proposed since the time that the EIR on the project was certified by the County Board of Supervisors in August 1996. These changes to the project are briefly described below and addressed in detail in this document.

1) Wastewater Treatment: Modification of the proposed wastewater collection and treatment process and treatment plant location such that all of the project-generated wastewater would be conveyed by conventional gravity sewers to a treatment plant located in the southeast portion of the site near Turlock Avenue. (There would be no individual on-site septic tanks as previously proposed.) The wastewater would receive tertiary treatment using the Sequential Batch Reactor (SBR) process, with final treatment and denitrification provided by an adjacent constructed wetland area. (The principal difference between tertiary treatment and the secondary treatment system previously proposed for the project is that tertiary treatment provides a higher level of filtration for the removal of contaminants, heavy metals and suspended solids, and also provides a higher level of nutrient removal. Under the tertiary treatment process proposed, the treated effluent would contain nitrate concentrations of less than 2 mg/l and a coliform count of less than 2.2/100ml, while secondary treated effluent would contain nitrate levels less than 25 mg/l and a coliform count of less than 23/100ml.) The treated effluent would be stored in a dedicated pond located to the south of the treatment facility, and would be applied as irrigation water on the nearby landscaped areas along the project frontage. The previous proposal involved collection of effluent only (with solids to remain in on-site septic tanks), which would be pumped up-gradient to a conventional treatment plant where it would receive secondary treatment, and then sprayed over the nearby practice range and open space areas.

2) Flood Control: Modification of the proposed on-site flood control facilities such a substantial portion of stormwater exceeding a flowrate of the 10-year storm would be diverted to the residential lake proposed for the southeast portion of the site, thereby significantly reducing the risk of downstream flooding during major storms including the 100-year event. During the 100-year event, approximately 400 cfs of the 800 cfs that would overspill West Branch Llagas Creek west of Coolidge/Turlock Avenues under existing conditions would be diverted to the lake, thereby reducing downstream flooding by about half. The previous proposal was to provide sufficient on-site attenuation of storm runoff such that the project would not result in any increased potential for downstream flooding relative to existing conditions. Thus, under the previous plan, the lake would have provided detention storage for approximately 65 cfs added by the project during the 100-year event, but would not have provided additional protection for the existing downstream flooding problems.

Format of CEQA Review

This document has been prepared in accordance with the requirements of the California Environmental Quality Act (CEQA) which sets forth specific requirements for the documentation of potential environmental impacts which may result from modifications made to a proposed project after an EIR on the project has been certified. Under these circumstances, Sections 15162 through 15164 of the CEQA Guidelines provide for the preparation of one of three types of documents depending on the situation. The criteria to be met for each type of document are as follows: 1) a 'Subsequent EIR' shall be prepared if the changes to the project are substantial, and will result in major revisions to the EIR, and involve a substantial increase in the severity of previously identified impacts; 2) a 'Supplement to an EIR' shall be prepared if the changes are substantial and the severity of impacts are increased, but only minor changes or revisions to the EIR are necessary; and 3) an 'Addendum to an EIR' shall be prepared if some minor changes and additions are necessary, but the conditions which would necessitate the preparation of a Supplement to an EIR are not present. In the present case, the proposed modifications may or may not be considered substantial, but the overall effect of the changes would be beneficial environmentally, and in no instance would the severity of the impact be

increased, as discussed in the body of this document. In addition, the changes to the EIR required to address the proposed project modifications are minor in nature. Thus two of the required criteria for preparing a Subsequent EIR and one of the required criteria for preparing a Supplement to an EIR would not apply. Therefore, according to CEQA criteria noted above, the type of environmental document that should be prepared in this instance is an 'Addendum to an EIR.'

Organization of This Document

As an Addendum to the EIR, this document identifies revisions to the certified EIR which reflect the changes in analysis resulting from the proposed modifications to the project. In order to facilitate the readers comprehension without having to refer back to the certified project EIR, this document contains the affected impact sections in their entirety. Thus the impact sections from the project EIR on Hydrology and Drainage, and Wastewater Treatment and Disposal, as well as their corresponding summary sections, have been included in this document. Changes to the text are indicated by ~~strikethrough~~ for deletions and <u>underline</u> for additions.

TABLE OF CONTENTS

SUMMARY

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SUMMARY OF IMPACTS AND MITIGATIONS

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E. HYDROLOGY AND DRAINAGE

1.	The project would potentially result in increased downstream flooding during the 100-year and 10-year storms. **(Potential Significant Impact)**	1. The on-site lake proposed for the southern residential cluster subdivision would be designed to provide sufficient detention storage for increased peak runoff resulting from site development. In addition, a diversion structure would be constructed in the creek channel to divert a substantial portion of the flows exceeding the existing 10-year flow rates to the residential lake, which would be sized to accommodate flows from the 100-year event. ~~With this pond~~ With these facilities, the peak flow rates leaving the project site during ~~the 100-year and the 10-year storms~~ significant storm events would be substantially lower than under existing conditions. **(Less-than-Significant Impact with Mitigation)**
2.	Portions of the residential cluster subdivisions and the wastewater treatment facility ~~would~~ may be subject to shallow flooding (one-foot average depth) during a 100-year event, and the proposed structures could also partially obstruct this sheet flow through the site. However, the total area of the site subject to shallow flooding would be reduced by flood control improvements included in the project. **(Potential Significant Impact)**	2. Potential impacts to the residential subdivisions and the wastewater treatment facility from shallow flooding would be mitigated by constructing building pads on fills raised above flood elevations. The partial obstruction of shallow overland sheet flows by the proposed development would be mitigated by balancing fills with cuts within the flood-prone areas. **(Less-than-Significant Impact with Mitigation)**

Q. WASTEWATER TREATMENT AND DISPOSAL

1.	The proposed project would increase the demand for wastewater treatment and disposal facilities at the site. **(Potential Significant Impact)**	1. Increased wastewater from the project would be treated and disposed with new facilities to be constructed in conjunction with the project. **(Less-than-Significant Impact with Mitigation)**
2.	The proposed wastewater disposal facilities may result in degradation of surface water and groundwater quality. **(Potential Significant Impact)**	2. Groundwater wells would monitor water quality up-gradient and down-gradient of the proposed spray irrigation area, with corrective action taken as necessary. **(Less-than-Significant Impact with Mitigation)**

Q. WASTEWATER TREATMENT AND DISPOSAL (CONT'D)

3. The use of reclaimed wastewater for ~~golf course~~ landscape irrigation, and storage of the treated effluent near the residential area ~~would~~ could expose humans to possible physical contact with the treated wastewater, resulting in a potential public health hazard. **(Potential Significant Impact)**	3. The wastewater would be treated to ~~levels deemed acceptable for disposal on golf courses~~, tertiary levels, and would therefore be acceptable for unrestricted landscape irrigation. ~~and the areas affected would be posted to notify golfers and employees where irrigation by treated wastewater is occurring~~ Signs would be posted within the irrigated landscape areas and at the effluent storage pond to notify residents of the presence of reclaimed water. **(Less-than-Significant Impact with Mitigation)**
4. There is a potential for overflow of the storage reservoir, resulting in a public health hazard. **(Potential Significant Impact)**	4. The wastewater storage reservoir would have sufficient capacity to accommodate high rainfall years. **(Less-than-Significant Impact with Mitigation)**
5. The wastewater treatment and disposal system could generate odors. However, since the SBR process proposed involves no odor-producing anaerobic digestion and would be entirely enclosed, no noticeable odors would be generated. ~~**(Potential Significant Impact)**~~ **(Less-than-Significant Impact)**	5. ~~Odor control would be achieved by mechanisms incorporated into the design of the pump stations and the treatment plant, and by measures to be undertaken at the effluent storage pond. (Less-than-Significant Impact with Mitigation)~~ No mitigation required.
6. The existing pond and proposed open water areas of the project, such as the wastewater storage pond and residential lake, have the potential to be sites for breeding of mosquitoes, which could create a nuisance and a potential public health problem. **(Potential Significant Impact)**	6. Mosquito breeding would be controlled by several methods, as appropriate for each type of water body. These methods would include the circulation of water to prevent stagnant conditions, the introduction of mosquito fish, and the application of larvacides. The specific mosquito mitigation measures would be formulated in consultation with the Department of Environmental Health Vector Control District. **(Less-than-Significant Impact with Mitigation)**
7. The location of the treatment plant near Turlock Avenue could result in potential noise impacts to existing and proposed residences in the vicinity. However, the pumps and aerators at this treatment plant would be largely submerged and entirely enclosed within a building, thus minimizing noise. **(Less-than-Significant Impact)**	7. No mitigation required.
8. The location of the treatment plant in proximity to existing and proposed residences could expose residents to potential release of hazardous materials used in the treatment process. However, this treatment plant would not involve the use of hazardous materials. **(Less-than-Significant Impact)**	8. No mitigation required.

I. PROJECT DESCRIPTION

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B. DESCRIPTION OF THE PROPOSED PROJECT

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Wastewater Treatment and Disposal

The proposed method of wastewater treatment and disposal for the project is the use of a centralized collection and treatment operation, with spray irrigation of the treated effluent ~~onto the proposed practice range~~ over specified landscape areas. All of the wastewater from the residential lots and golf course facilities would ~~have septic tanks for the primary treatment (settlement) of solids, with untreated effluent piped to the proposed treatment facility to be located north of the driving range~~ be collected by gravity flow and conveyed to a treatment facility located in the southeastern portion of the site near Turlock Avenue. The treatment would provide tertiary treatment and would utilize the Sequential Batch Reactor (SBR) process, combined with disinfection and final treatment at a constructed wetland nearby. (The principal difference between tertiary treatment and the secondary treatment system previously proposed for the project is that tertiary treatment provides a higher level of filtration for the removal of contaminants, heavy metals and suspended solids, and also provides a higher level of nutrient removal. Under the tertiary treatment process proposed, the treated effluent would contain nitrate concentrations of less than 2 mg/l and a coliform count of less than 2.2/100ml, while secondary treated effluent would contain nitrate levels less than 25 mg/l and a coliform count of less than 23/100ml.)

An effluent storage pond would be excavated ~~to the northwest of the driving range~~ just south of the treatment facility, to provide wet weather storage of the treated effluent. This pond would appear as part of the residential lakes proposed for this area, but in fact would be a separate impoundment. The treated effluent would be disposed of by spray irrigation over ~~the driving range, the chipping green area, and a 3 to 4-acre area in the adjacent permanent open space area to the west~~ the nearby landscaped areas along the site frontage (~~see Section *III. Q. Wastewater Treatment and Disposal*~~). The treated effluent would be applied at rates matching the evapotranspiration rate of the landscape plants, and spray irrigation would ~~not occur~~ be greatly reduced during the winter months when rainfall would provide for most of the water needs. Thus there would be no leaching or runoff of effluent into the groundwater or on-site drainages. (For a detailed description of the proposed treatment and disposal facilities see Section *III. Q. Wastewater Treatment and Disposal.*)

The golf course maintenance facility located at the western end of the golf course would not be connected to the centralized wastewater disposal system, but would have its own individual septic tank and leachfield.

II. CONSISTENCY WITH PLANS, POLICIES AND REGULATIONS

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*

D. SANTA CLARA COUNTY POLICIES AND REGULATIONS

General Plan

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*

Health and Safety

*

*

Wastewater Disposal

The following General Plan policies on Wastewater Disposal are applicable to the project:

R-HS 42 All new septic systems shall be located only in areas where:

a. there is reasonable assurance that they will function effectively over a long period;
b. they can be designed to have a minimum negative impact on the environment; and
c. they will not contaminate wells, or surface and groundwater supplies.

R-HS 43 Septic systems shall not be allowed where site characteristics impede their operation, including sites with:

a. high groundwater conditions;
b. highly permeable soils where wastewater will percolate in excess of one minute per inch;
c. limited depth to bedrock; or
d. gradients in excess of 20% without appropriate studies.

R-HS 44 Alternative or specially engineered wastewater systems may be allowed for commercial or industrial uses, providing:

a. the County has approved a program which ensures that the system's long term maintenance, operating, monitoring and liability costs are provided for by the owner of the facility;
b. the proposed system has a track record of safe and effective long term operation under conditions similar to those in Santa Clara County;
c. the proposed system includes adequate measures to prevent environmental damage in the event of system failure;
d. is appropriate to the site for which it is proposed;
e. is in compliance with all the other pertinent County policies and regulations; and
f. with Regional Water Quality Control Board wastewater discharge requirements.

R-HS 45 Alternative wastewater treatment and disposal systems may be allowed for individual residential development only if:

a. a traditional septic system adequate to serve the proposed development could be constructed, if needed;
b. it can be shown that the alternative system will function more effectively than a septic tank system and be beneficial to the environment;
c. the density of the proposed residential development is consistent with the density normally allowed within that property's General Plan land use designation;
d. the proposed system has a tack record of safe and effective long term operation under conditions similar to those in Santa Clara County;
e. the proposed system is in compliance with all other pertinent County policies and regulations;
f. the system is appropriate to the site for which it is proposed;
g. the proposed system includes adequate measures to prevent environmental damage in the event of system failure, such as discharge of inadequately treated effluent to the land (e.g., surface, lakes, streams, etc.);

h. the proposed system will operate in full compliance with Regional Water Quality Control Board waste water discharge requirements; and

i. the County has approved a program which ensures that the system's long term maintenance, operating, monitoring and liability costs are provided for by the owner of the facility. Such a program may include, but is not limited to, recorded contractual obligations, permit fees or insurance policies; special permit conditions; and, performance bonds for system replacement.

R-HS 46 Alternative waste water disposal systems intended to serve two or more residences may be allowed only if:

a. they comply with all provisions of the preceding policy; and

b. there exists an appropriate public entity which has agreed to, and is financially able to, assume full responsibility for the system's long term maintenance, operating, monitoring and liability costs.

Analysis: The proposed wastewater treatment facilities conform with the above policies in all respects. If necessary, a traditional septic system could be constructed to serve the residential development. However, given the historically high nitrate levels in the Llagas Groundwater Basin, it would be beneficial to the environment to utilize the proposed alternative system here instead. The proposed Sequential Batch Reactor (SBR) process would be particularly beneficial here since it would provide tertiary level treatment resulting in final nitrate concentrations of less than 2 mg/l. (See Section *III. Q. Wastewater Treatment and Disposal* for a detailed discussion of the proposed treatment system.)

The wastewater system proposed for the project would require the approval of the County Department of Environmental Health and the Central Coast Regional Water Quality Control Board, which would in effect implement the above policies. Therefore, the project would be consistent with the Wastewater Disposal policies of the General Plan.

III. ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

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E. HYDROLOGY AND DRAINAGE

This discussion is mainly based on the following reports: Hydrology and Drainage - Lion's Gate Development prepared by Schaaf & Wheeler in November 1995; and the Preliminary Design Report for the Lion's Gate Reserve Master Drainage Plan prepared by Pacific Advanced Civil Engineering in November 1996. ~~The full report is included as~~ Both of these reports are contained in Appendix D of this EIR.

Environmental Setting

Area-Wide Drainage

The project site is located in the Llagas Creek watershed which drains from the eastern slopes of the Santa Cruz Mountains and the western slopes of the Mount Hamilton Range south to the Pajaro River and Monterey Bay near Watsonville. The major tributaries of Llagas Creek are Little Llagas Creek, Madrone Channel, Coralitos Creek, San Martin Creek, Church Creek, and West Branch Llagas Creek. Llagas Creek and its tributaries drain a total of approximately 105 square miles upstream of its confluence with the Pajaro River south of Gilroy.

The climate of the south Santa Clara Valley is similar to that of the San Francisco Bay Area. Summers are warm and dry while winters are mild and moderately wet. Nearly 90 percent of the annual rainfall occurs in the late fall or winter months, with January normally being the wettest. The mean annual precipitation varies within the Llagas Creek watershed from a high of over 50 inches in the Santa Cruz Mountains to a low of 14 inches on the valley floor. The basin-wide average is approximately 20 inches per year.

Stream flows in Llagas Creek are regulated by Chesbro Reservoir, which is owned and operated by the Santa Clara Valley Water District. The reservoir has a total storage capacity of approximately 8,100 acre-feet. The reservoir is operated for water supply purposes, but does provide some incidental flood control benefit due to peak flow attenuation.

The upland areas of the Llagas Creek watershed have soils developed on sedimentary rock, basic igneous rocks and serpentine rocks. The main soils are of the Los Gatos, Gaviota, Vallecitos and Haymen associations. They range in depth from shallow to deep, and are located on steep to very steep slopes. The vegetative cover includes grasses, oak, pine, brush and hardwoods. The infiltration rates of water in the upland areas is generally slow. The upland soils are classified as having a high to very high erosion potential.

The upland portions of the Llagas Creek watershed have very little development at this time, and the County General Plan calls for only limited development in the future with mostly open space. On the valley floor, most of the Llagas Creek channel and its tributaries are leveed or perched channels with channel banks higher than adjacent areas on one side or both sides of the stream channel. Therefore, overflows from the channel tend to flow away from and parallel to the channel.

Based on information from the Federal Emergency Management Agency (FEMA) Flood Insurance Study for Santa Clara County, there are extensive areas of floodplain from Llagas Creek and its tributaries. The most serious of these are within the City of Morgan Hill from West Little Llagas Creek, and in the City of Gilroy from West Branch Llagas Creek.

The Santa Clara Valley Water District and the Soil Conservation Service have completed a flood control project for the Llagas Creek watershed. The downstream reach from Bloomfield Road to the Ronan Channel has been improved to 100-year design standards, and the reach from the Ronan Channel to Route 101 has been improved to 10-year design standards. In addition, 100-year design channels have been provided in the urban areas of Morgan Hill and Gilroy. Improvements in Gilroy included diversion of West Branch Llagas Creek to the Ronan Channel, and channel improvements upstream to Day Road. The project was designed to eliminate most flooding in Gilroy south of Day Road. This project has been completed, and FEMA is in the process of changing the Flood Insurance Rate Maps for this area.

Site Drainage and Flooding Conditions

The project site drains to two separate drainages. The western portion of the site drains to the west to Hayes Creek near Watsonville Road while the majority of the site drains via the east to the West Branch Llagas Creek. A network of intermittent and ephemeral streams flow from the higher elevations on the perimeter of the central valley into the West Branch of Llagas Creek. The Creek has 8 primary tributaries, 4 of which drain the hills north of the valley and with the other 4 originating on the southern ridgeline. These tributary streams flow during winter and spring months for varying periods and are dry the remainder of the year. West Branch Llagas Creek discharges to the Ronan Channel which joins Llagas Creek near Highway 152 east of Gilroy. Hayes Creek drains to Llagas Creek near Watsonville Road, south of Morgan Hill. The are no detailed floodplain studies for Hayes Creek. The area is designated as Zone D on the Flood Insurance Rate Map. Zone D is defined as an area of undetermined flood hazard.

The existing Flood Insurance Rate Maps for West Branch Llagas Creek do not include detailed floodplain studies upstream of Golden Gate Avenue, approximately 2 miles south of Highland Avenue. The stream channel on the project site is designated as Zone A, approximate 100-year floodplain. At Turlock Avenue, the floodplain is shown as approximately 300 feet wide along the channel north of Highland Avenue.

West Branch Llagas Creek has been restudied by FEMA to update the existing Flood Insurance Rate Maps. The draft work maps are currently in the review process and are not expected to be become effective until late 1996. The SCVWD is using the revised maps as the best available information in the interim. The proposed 100-year floodplain for West Branch Llagas Creek near Highland Avenue is significantly larger on the revised maps than on the current maps. The proposed floodplain includes shallow flooding from the channel commencing at the ranch complex on the project site and including the area south of Highland Avenue, west of Turlock Avenue, and the area north of Highland Avenue west of Coolidge Avenue (see Figure 13).

The hydrology for the detailed floodplain study shows an estimated 100-year peak flow rate of 850 cubic feet per second for West Branch Llagas upstream of ~~the on-site overflows upstream of~~ Turlock Avenue. An estimated 400 cfs overflows Highland Avenue toward the south upstream of Turlock Avenue. An additional 355 cfs overflows from the channel toward the north upstream of Coolidge Avenue. The northern overflow crosses Coolidge Avenue north site and flows overland to the east and south to the West Branch Llagas Creek channel at Highland Avenue. The majority of the overflow to the south flows overland to the south and east and crosses Turlock Avenue to rejoin the West Branch Llagas Creek floodplain between Highland Avenue and Golden Gate Avenue. A portion of the overflow continues south along the west side of Turlock Avenue.

Ordinances and Regulations that Address Drainage and Flooding

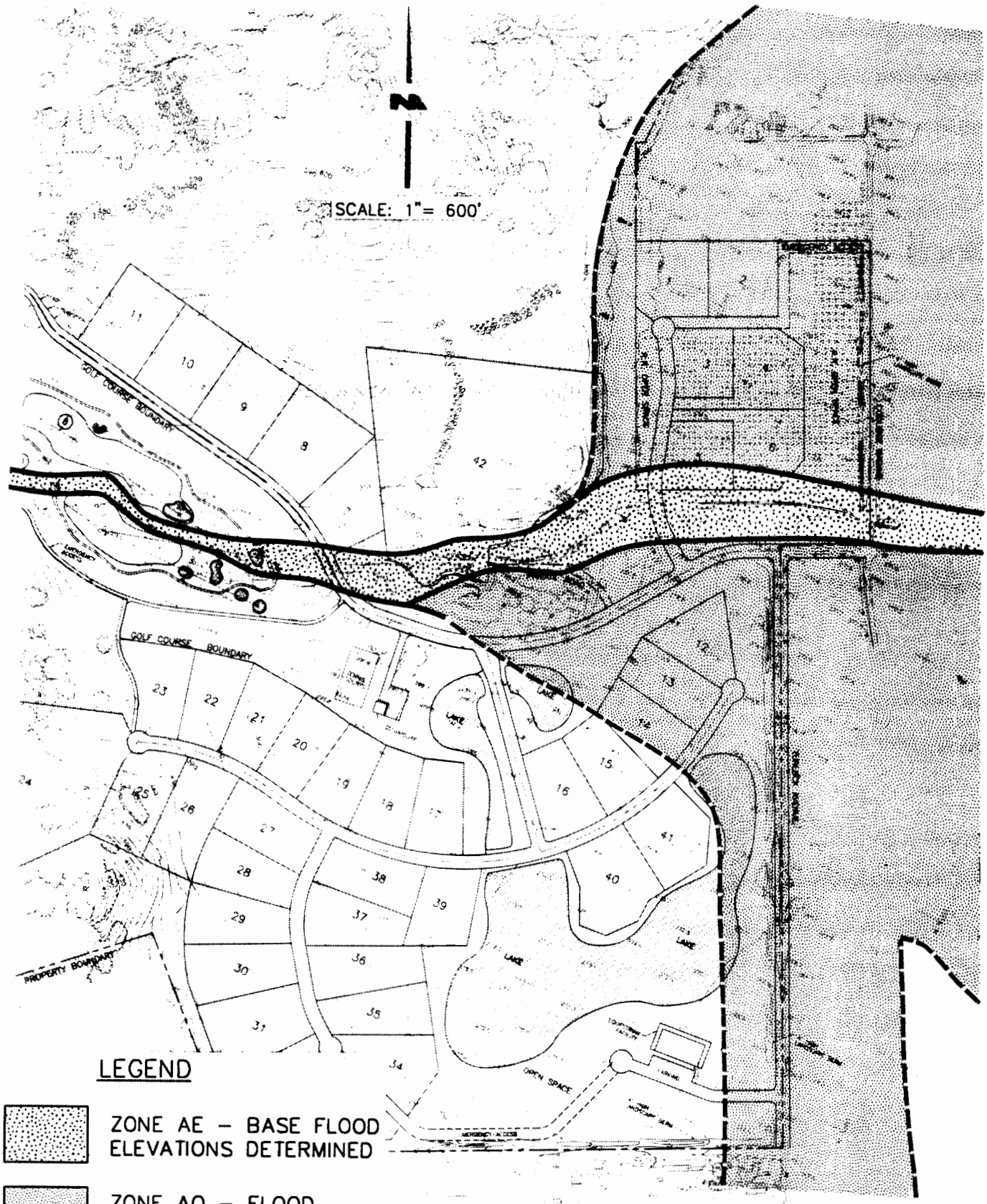
County Drainage Manual: This manual contains guidelines for design and installation of drainage facilities for projects. Projects must demonstrate that drainage will be handled adequately in order to avoid drainage and flooding problems. These guidelines ensure that there are no on- or off-site drainage problems associated with a project.

Grading Ordinance: The ordinance requires that all drainage structures and devices be consistent with the adopted County Drainage Manual and its standards. It outlines disposal requirements for both on- and off-site drainage; provides for slope protection and erosion control; and the design of dikes, swales and ditches.

Land Development Regulations: The County Land Development Engineer reviews all projects to ensure no on- or off-site drainage impacts would occur as a result of the proposed project.

Zoning Ordinance: For projects requiring a use permit, Section 47-5(d) of the Zoning Ordinance ensures that adequate storm drainage exists or shall be provided as a part of the project; and that no on- or off-site drainage impacts would result from the project.

Special Flood Hazard Area Ordinance: This ordinance applies to all areas of special flood hazard (i.e., within the 100-year flood zone as established by FEMA) within the unincorporated area of Santa Clara County. No



100-YEAR FLOODPLAIN

FIGURE 13

new development shall occur, or structure or improvement shall be constructed in a flood zone without compliance with this ordinance.

Significance Criteria

With respect for flooding and drainage impacts, Appendix G of the CEQA Guidelines states that a project will normally have a significant effect on the environmental if it will: "(g) Cause substantial flooding, erosion or siltation."

Impact and Mitigation

Impact 1. **The project would potentially result in increased downstream flooding during the 100-year and 10-year storms. (Potential Significant Impact)**

The proposed residential development on the project site would increase the amount of impervious area on the site and therefore increase the runoff from the site.

The cluster residential development area south of Highland Avenue would be served by storm drains which would discharge to the 20-acre lake proposed for the main subdivision area. The overflows from the lake would discharge via storm drains to West Branch Llagas Creek upstream of Coolidge Avenue. In addition, there are approximately 73 acres of hillside area upstream of this residential development area. Drainage from this area would also be collected by the storm drain system and discharge to the lake. The total area of this drainage area is approximately 240 acres.

The golf course would also be located entirely within the West Branch Llagas Creek watershed which drains to the east. There would be no development in the western portion of the site which drains to the west to Hayes Creek. The West Branch Llagas Creek watershed upstream of Turlock Avenue is approximately 1,060 acres or 1.66 square miles. The golf course development would include approximately 240 acres, the majority of which would be landscaping and turf. The upstream hillside areas would not be affected. The existing creek channel and pond would be largely maintained in their existing configurations. A new pond would be constructed west of the existing pond to serve as an irrigation water reservoir and to detain runoff from the undeveloped area upstream. The new pond would include approximately 9 acre-feet of detention storage.

To analyze potential drainage and flooding impacts, the project site was divided into the following 3 drainage areas: the cluster residential subdivision south of Highland Avenue; the area upstream of the existing pond; the area upstream of the proposed new irrigation reservoir; and the area downstream of the pond golf course reservoir. Discharge rates were estimated for the 10-year and 100-year storms for existing and project conditions.

The results of the flooding analysis show that the proposed golf course would reduce the flow from the site to West Branch Llagas Creek. The golf course would decrease the estimated peak runoff from the watershed because the proposed irrigated turf would maintain a dense layer of thatch which would act as a sponge and reduce runoff, whereas the existing unirrigated range grasses tend to be sparse, with exposed dirt between grass clumps, which does not retain as much runoff. The estimated 100-year peak flow from the golf course area would decrease from 780 cubic feet per second to 765 cubic feet per second, a decrease of 2 percent. The 10-year peak flow rate would decrease from 375 cubic feet per second to 360 cubic feet per second, a decrease of 4 percent.

The proposed golf course irrigation reservoir would also act as a detention facility to reduce the estimated peak flow rate from the western portion of the watershed. For purposes of analysis, the existing pond was assumed to be full at the start of the storm and to have minimal effect on the flood hydrograph. The proposed irrigation reservoir was

assumed to be full to spillway elevation at the start of the storm, and to have a 12-foot wide spillway. The estimated storage capacity of the pond is 9-acre-feet with 3 feet of flow over the spillway. The detention storage in the irrigation reservoir would reduce the estimated 100-year peak flow at the pond from 59 cubic feet per second to 39 cubic feet per second, a reduction of 20 cubic feet per second. However when routed downstream and combined with the larger watershed downstream, the detention storage reduces the peak by approximately 10 cubic feet per second. This is due to the difference in timing between the peak flow in the upper watershed and the lower portion of the watershed. The peak flow from the upper watershed is delayed by the travel time along the creek channel and arrives after the peak from the lower watershed. Therefore the peaks do not add directly. The detention storage in the upper watershed acts to increase the timing difference of the upper watershed.

The proposed golf course grading would also include local detention areas to contain runoff from the turf areas for water quality purposes. These would also act to reduce runoff from the site, particularly for small storms. The effect of these detention areas on larger storms would depend on the design and placement of each area and whether the upstream hillside areas would drain to the detention areas or directly to the creek. Therefore, the effects of potential detention storage on the golf course other than the larger pond were not considered in the hydrograph analysis.

The flooding analysis indicated that the proposed cluster residential development would result in a potential increase in the peak runoff from the development site. The 100-year peak flow from the entire watershed would increase from 236 cubic feet per second to 301 cubic feet per second, an increase of 28 percent. The 10-year peak flow rate would increase from 120 cubic feet per second to 160 cubic feet per second, an increase of 33 percent. The increase in peak runoff is due to both the increased impervious area in the development, and the more efficient drainage system which collects runoff faster than the existing overland flow conditions.

However, the cluster residential subdivision would include a proposed lake, and runoff would be drained to the lake, then released to West Branch Llagas Creek. Only the proposed equestrian center in the southeastern corner of the site would be below the lake elevation and would drain toward Turlock Avenue. There is no storm drain system along Turlock Avenue, but runoff flows along the road under existing conditions.

The residential cluster subdivision is located in a drainage area of 240 acres, which would drain to the proposed lake. Without the lake, increased peak runoff from the cluster residential subdivision would potentially increase the peak flow in West Branch Llagas Creek downstream of the project.

Mitigation 1. **The on-site lake proposed for the southern residential cluster subdivision would be designed to provide sufficient detention storage for increased peak runoff resulting from site development. In addition, a diversion structure would be constructed in the creek channel to divert a substantial portion of storm flows exceeding existing 10-year flow rates to the residential lake, which would be sized to accommodate flows from the 100-year event. ~~With this pond~~ With these facilities, the peak flow rates leaving the project site during ~~the 100-year and 10-year storms~~ significant storm events would be substantially lower than under existing conditions.**

The potential increased runoff from the residential area during the 100-year event would be 65 cubic feet per second, without the proposed lake. The proposed lake would have a normal water surface elevation less than the top of bank elevation of West Branch Llagas Creek at the outfall from the pond. ~~The outfall would have a flap gate to prevent high water levels in the creek from discharging back into the pond.~~ The diversion structure in the creek would be designed such that a substantial portion of the flows in the creek less than the existing 10-year peak flow would pass under the structure and would not be able to enter the side channel to the lake. Flows exceeding the 10-year peak flow would be

blocked by the structure and diverted to the lake for temporary storage (see Figure 13a). This would reduce the 100-year flow rate leaving the site from approximately 800 cfs under existing conditions to approximately 400 cfs. This substantial reduction in flood flows leaving the site would significantly reduce flooding problems along the West Branch of Llagas Creek downstream of the site. However, there still would be overland and downstream flooding during the 100-year event, but the extent and volume of flooding would be reduced as a result of the proposed diversion and storage. Once the storage capacity of the lake is reached, any additional flows would be prevented from entering the lake. Instead, these extreme flood flows would be allowed to overspill the creek, as would occur under existing conditions. The outflow from the ~~pond~~ lake would only occur when the water level in the creek is low. Therefore, the outflow from the pond would not contribute to the existing flood problems from the creek channel.

~~The proposed pond in the residential development would include an overflow spillway release for larger flood events, and an active detention storage volume between the normal water level and the spillway crest. Based on a preliminary design which includes 2 feet of active detention storage below the spillway crest and one foot of storage above the spillway crest, the proposed pond could contain approximately two-thirds of the total runoff from the residential development area and the upstream hillside area during the 10-year 24-hour design storm. The pond would release approximately 30 cfs over the spillway to Turlock Avenue during the 10-year storm. This would be significantly less than the existing condition peak flow rate of 120 cfs. For smaller flood events there generally would be no spill from the pond, and runoff stored in the pond would be released to the creek after the high water levels in the creek have receded. The outlet to the creek would release approximately 20 cfs to drain the active storage volume of the pond in 24 hours after the storm.~~

~~During the 100-year 24-hour flood event, the total runoff to the lake would be approximately 125 acre-feet. With no outlet release to the creek during the storm, the pond would overflow to Turlock Avenue once the active storage has filled. The estimated peak overflow would be 140 cfs for the 100-year flood. The existing peak runoff from the site during the 100-year event is estimated to be 236 cfs. Thus, although the shallow flooding along Turlock Avenue that occurs during the 100-year event under current conditions would not be eliminated, it would be substantially reduced by the flood control elements to be incorporated into the project.~~

~~The only potential adverse effect of increased peak runoff from the hillside cluster residential development site would be to increase the peak flow in West Branch Llagas Creek downstream of the project. Due to the operation of the outlet from the pond, this could only occur once the high water levels in the creek have receded and the potential for downstream flooding has passed. Therefore, there would be no increase in downstream flooding. The low flows in the creek would continue for a longer time after a storm due to the releases from the detention pond. This should not be a significant impact.~~

Since the residential lake would be sized to contain a substantial portion of the 100-year peak flow, the shallow flooding that occurs along the Turlock and Coolidge Avenue frontage areas of the site during the 100-year event would be significantly reduced (see discussion under 'Impact 2' below).

The equestrian center area in the southeast portion of the project site would not drain to the pond in the residential development area. Due to the site topography, there would be a berm between the equestrian center and the pond to contain the pond. The maximum height of the berm would be approximately 7 feet. The equestrian center would continue to drain to Turlock Avenue and ultimately to West Branch Llagas Creek. Because of the limited impervious area associated with the equestrian center, there should be no increase in runoff from the area after the project. In addition, the proposed equestrian center would include a detention pond for water quality purposes.

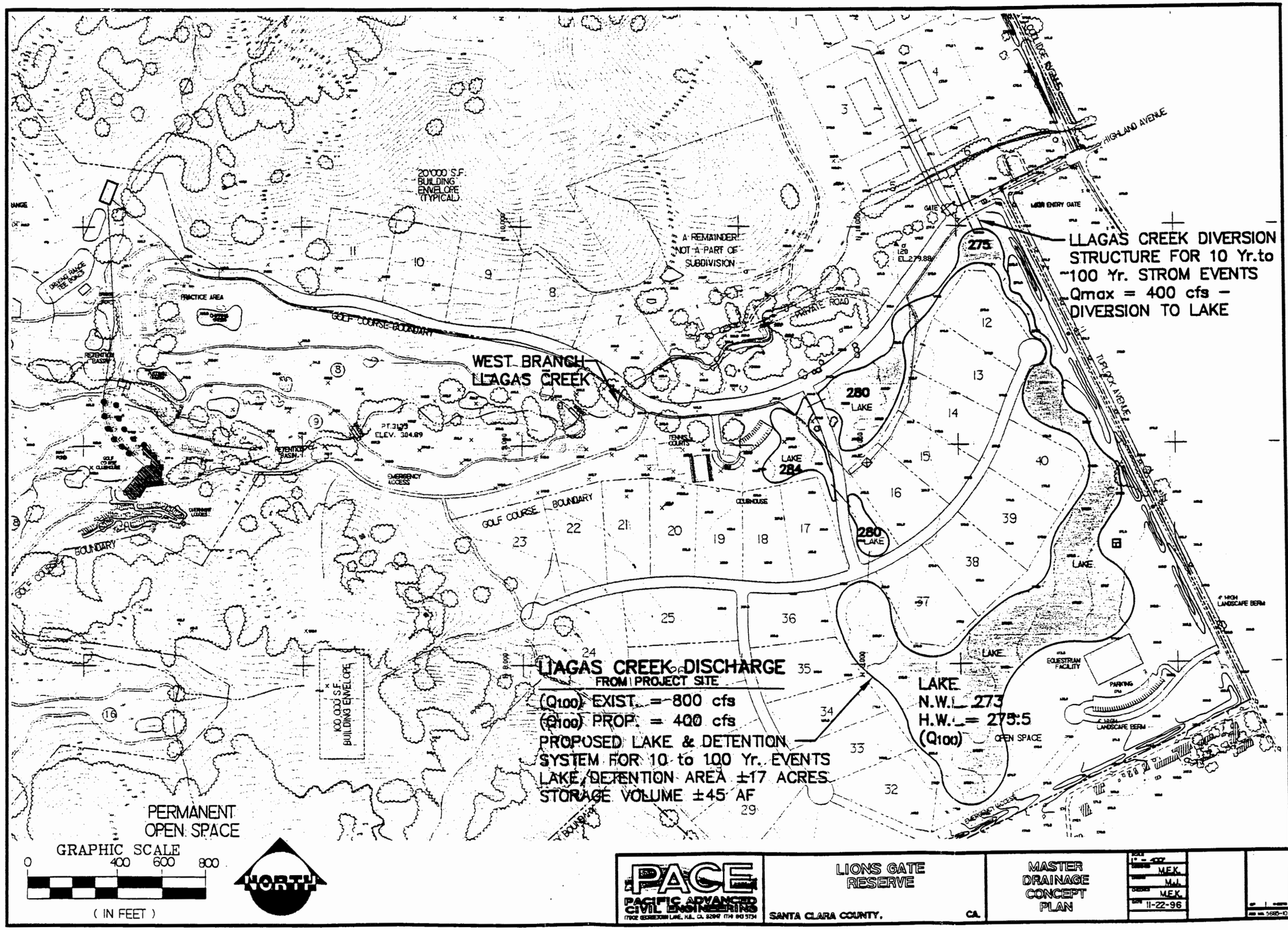

LLAGAS CREEK DIVERSION STRUCTURE FOR 10 Yr.to 100 Yr. STROM EVENTS Qmax = 400 cfs — DIVERSION TO LAKE
WEST BRANCH LLAGAS CREEK
20'000 S.F. BUILDING ENVELOPE (TYPICAL)
A REMAINDER NOT A PART OF SUBDIVISION
GOLF COURSE BOUNDARY
PRACTICE AREA
DRIVING RANGE TEE BOXES
RETENTION BASIN
PT.3123 ELEV. 304.89
EMERGENCY ACCESS
TENNIS COURTS
CLUBHOUSE
LAKE 284
LAKE 280
MAIN ENTRY GATE
PRIVATE ROAD
HIGHLAND AVENUE
TULLOCK AVENUE
275
LLAGAS CREEK DISCHARGE FROM PROJECT SITE
(Q100) EXIST. = 800 cfs
(Q100) PROP. = 400 cfs
PROPOSED LAKE & DETENTION SYSTEM FOR 10 to 100 Yr. EVENTS
LAKE / DETENTION AREA ±17 ACRES
STORAGE VOLUME ±45 AF
LAKE
N.W.L. 273
H.W.L. = 275.5
(Q100)
OPEN SPACE
EQUESTRIAN FACILITY
PARKING
6' HIGH LANDSCAPE BERM
PERMANENT OPEN SPACE
GRAPHIC SCALE
0 400 600 800
(IN FEET)
NORTH
PACE
PACIFIC ADVANCED CIVIL ENGINEERING
LIONS GATE RESERVE
SANTA CLARA COUNTY, CA.
MASTER DRAINAGE CONCEPT PLAN
M.E.K.
M.J.
M.E.K.
11-22-96
PATH O:\5685\5685-10\WORKDWGS\WWFCP-XHBT2.DWG XREF: 588510-BASE.DWG PLOT DATE: 11/22/96

FIGURE 13a

Impact 2. **Portions of the residential cluster subdivisions would be subject to shallow flooding (one foot average depth) during a 100-year event, and the proposed dwellings could also potentially obstruct this sheet flow through the site. However, the total area of the site subject to shallow flooding would be reduced by flood control improvements included in the project. (Potential Significant Impact)**

Based on the revisions to the existing Flood Insurance Rate Map, shown in Figure 13, the West Branch Llagas Creek would overflow to the south upstream of Turlock Avenue (i.e., at the on-site ranch complex). For the 100-year flood, approximately 400 cubic feet per second would cross through the northeastern portion of the cluster residential development, in particular through Lots 12, 13 and 14 at the northeast corner of the subdivision. This mapped overflow crosses the site and Turlock Avenue to rejoin West Branch Llagas Creek 500 to 1,000 feet downstream of Highland Avenue. The overflow is indicated as shallow flooding with an average depth of one foot, indicating that the proposed lots would be prone to flooding. In addition, grading for the residential lots in the overflow area could adversely affect the sheetflow through the area if the flow is obstructed. Similarly, grading for the access road the project and landscaping along Turlock Avenue could affect the sheetflow across the site.

The revised flood maps also show an overflow to the north from West Branch Llagas Creek upstream of Coolidge Avenue. For the 100-year flood, approximately 355 cubic feet per second would cross through proposed the rural residential development north of Highland Avenue and west of Coolidge Avenue. The overflow would flow overland to rejoin West Branch Llagas Creek at the culvert under Highland Avenue. Part of the overflow is designated as shallow flooding with an average depth of one foot, and a small sliver along the north boundary is indicated for flood depths of 0.5 to 2.5 feet. All six of the 5-acre lots are within the mapped 100-year floodplain area and thus would be prone to flooding. Also, grading for the residential lots and cul-de-sac in the floodplain could have an adverse affect on the sheetflow if flow is obstructed.

Both the area subject to potential sheet flooding and the volume of flood water spilled would be substantially reduced by the flood diversion and storage facilities described under 'Mitigation 1' above. The residential lake would detain the increment of runoff generated by the project in addition to approximately 400 cfs of the peak flow during the 100-year event, which would represent approximately one-half of the overland flows overspilling the creek west of Coolidge/Turlock Avenues on the project site during the 100-year event. The precise reduction in flood plain area would be calculated in conjunction with the preparation of the Final Master Drainage Plan for the project.

Mitigation 2. **Potential impacts to the residential subdivisions from shallow flooding would be mitigated by constructing building pads on fills raised above flood elevations. The potential obstruction of sheetflows by the proposed development would be mitigated by balancing fills with cuts within the flood-prone areas.**

The potential impact of placing a portion of the proposed residential development within the 100-year floodplain areas would be mitigated by balancing the grading within the 100-year floodplain. This would mean that fills required to elevate building pads above flood elevations would need to be balanced by cut areas to allow flood flows between the buildings. This procedure is generally most effective in shallow flooding areas with limited building coverage as in the proposed project. If the buildings cover a large percentage of the floodplain and are in deeper flood area, and effective balance between cut and fill would be problematic. For instance, if a building obstructs 50 percent of the floodplain in 3 feet of flood depth, the building pads would have to be elevated 3 feet, and the remainder of the floodplain would have to be excavated 3 feet to balance the cut and fill. This would lead to an elevation difference of 6 feet between the building pads and the adjacent ground. In the proposed project, the building densities would be very low with 2 to 3 acre residential lots. Thus, building elevations of 1 to 2 feet above existing grade

would become 2 to 3 feet or less above the new ground elevations because of the larger area available to balance the fill.

Conclusion. **With implementation of the above mitigations as proposed in the project, the potential flooding impacts of the project would be reduced to less-than-significant levels.**

Q. WASTEWATER TREATMENT AND DISPOSAL

The following discussion is ~~largely~~ based on the following reports: Wastewater Feasibility Study for Lion's Gate Reserve prepared by Questa Engineering in December 1995; and Preliminary Design Report for the Lion's Gate Reserve Project Wastewater System prepared by Pacific Advanced Civil Engineering in December 1996. These reports are contained in Appendix N.

Environmental Setting

No public sanitary sewer system exists on the project site or in adjacent areas. The nearest public sanitary sewer system is located in the City of Morgan Hill, approximately one mile north of the project site.

The existing wastewater facilities for the on-site residences located on Highland Avenue consist of individual septic systems, which appear to be functioning normally.

Ordinances and Regulations that Address Wastewater

Sewage Disposal Ordinance: This ordinance establishes standards for the approval, installation and operation of individual, on-site sewage disposal systems (septic tank and leachfields) consistent with the appropriate California Regional Water Quality Control Board standards and basin plans. These standards are adopted so as to preclude the creation of health hazards and nuisance conditions and to protect surface and groundwater quality. Systems generating more than 2,500 gallons per day of effluent must be reviewed by the appropriate Regional Water Quality Control Board. Percolation tests are required to determine the suitability of a site for leachfields and to determine the amount of leachfields required. The systems are required to be set back a minimum distance from wells, creeks, reservoirs, springs, etc. The County Department of Environmental Health implements this Ordinance and issues the required septic tank permits.

~~County Ordinance Code - Chapter II, Article 3, Private Sewage Disposal in Lexington Basin: This ordinance sets additional requirements for the establishment of sewage disposal systems in the Lexington Basin. All lands within the basin have been mapped according to septic suitability, with varying design criteria, including minimum lot sizes, stipulated for each zone. In areas with poor septic suitability ratings, the ordinance requires installation of a second drainfield in the event of failure of the first leachfield. The ordinance requires 10 feet of separation between the leachlines and underlying groundwater table or bedrock.~~

County Zoning Ordinance: Section 47-(d) stipulates use permit findings that waste and sanitation facilities shall satisfy applicable County, state and federal requirements and that the use shall not adversely affect water quality.

Significance Criteria

With respect to wastewater, Appendix G of the CEQA Guidelines states that a project will normally have a significant effect on the environment if it will:

"(f) Substantially degrade water quality;
(g) Contaminate a public water supply; or
(h) Substantially degrade or deplete groundwater resources.
(s) Extend a sewer trunk line with capacity to serve new development."

Impacts and Mitigation

Impact 1. **The proposed project would increase the demand for wastewater treatment and disposal facilities at the site. (Potential Significant Impact)**

The proposed residences, golf course clubhouse, overnight units, swim and tennis center, and equestrian center would significantly increase the wastewater disposal requirements for the property. Although use of the golf facilities would vary seasonally and between weekdays and weekends, wastewater facilities should be designed on the basis of maximum expected daily flows, i.e., assuming 100-percent facility use. In order to calculate overall flows, the maximum wastewater treatment requirements were estimated for each project component, as described below.

Single-Family Residential Units: The project includes 41 custom residential lots. For central wastewater facilities, average flows from single-family residential units are typically estimated to be in the range of about 200 to 250 gallons per day (gpd) per connection. The actual flows will vary depending upon the size, occupancy and character of the residences, and the degree to which water conserving plumbing devices and practices are incorporated in the homes. The recent laws in California requiring low-flow plumbing devices (e.g., 1.6-gallon flush toilets) in new construction have had a measurable effect on wastewater flows; typical flows from new residential areas tend to average less than 200 gpd/house. (A similar project in Monterey County has experienced average daily flows of 150 to 175 gallons per dwelling over a six year period of operation.) To be conservative in planning wastewater facilities for the proposed project, an average daily unit flow estimate of 250 gpd/residence was assumed; this would adequately account for wastewater from a 4 to 5 bedroom (or more) residence on each parcel. On this basis, the total estimated flow contribution from the proposed 41 single-family residences would be 10,250 gpd (average dry weather flow).

Clubhouse: The clubhouse would generate wastewater from the restaurant, the employees and golfers. The flow estimates for each are as follows:

Restaurant: Based on a unit flow of 10 gallons per meal, the total daily flow for a maximum 200 meals would be 2,000 gpd.

Golfers: At a unit flow for restrooms of 5 gpd, 200 golfers would generate a total of 1,000 gpd. Assuming 10 percent of golfers would take showers, at 25 gpd, this would result in an additional 2,000 gpd for showers.

Employees: Up to 30 employees would work in and around the clubhouse on any given day. Based on a unit flow of 15 gpd per employee, the maximum flow would be 450 gpd.

Overnight Lodging: The maximum flows for the 45 overnight units were estimated on the basis of 150 gpd/unit, yielding total flows of 6,750 gpd.

Swim and Tennis Center: These facilities would be available for use by residents, corporate members and their guests. The facilities would include restrooms, showers and, perhaps, a small kitchen. Use of these facilities would be greatest in the summer and on weekends, and smallest in the winter and during the week. Accordingly, daily wastewater flows would fluctuate greatly. For planning purposes, the maximum daily flow is estimated to be 500 gpd, based on 50 visitors/employees per day and a unit flow of 10 gpd/person. In addition, backwash water from the swimming pool filter and occasional draining of the spa at the proposed recreation center would go to the wastewater system and add small volumes to the overall flow (i.e., not more than a few hundred gallons per week; and it would be greater in the warm summer months than in the winter). The spa would likely be drained once or twice per year, contributing about 1,000 to 1,500 gallons of flow to the system at each draining. These flows constitute minor miscellaneous additions that are accounted for by the 1,000 gpd "contingency" contained in the preliminary wastewater flow projections (see Table 17).

Equestrian Center: This facility would have restrooms for employees and visitors. The wastewater flows from the equestrian facility are estimated to be approximately 400 gpd, based on 25 visitors/employees per day at a unit flow of 10 gpd/person, and 150 gpd for the caretaker's residence.

The total estimated wastewater flows are summarized in Table 17. Based on the above generation rates, the total wastewater flow for the Lion's Gate project is estimated to be approximately 23,000 gpd. This includes a contingency of approximately 5 percent to account for uncertainties about the specific details of project facilities that would not be determined until the design stage. Final wastewater facility design would also need to anticipate and provide for peak flow conditions which, on a daily basis, may be in order of 25 to 30 percent higher than the average daily flow. For the proposed project this translates to a peak system flow estimate of about 30,000 gpd.

TABLE 17

ESTIMATED WASTEWATER FLOWS*

Activity	Number of Units	Daily Flows	Total (gpd)
Residences	41 houses	250 gpd	10,250
Golf Course Clubhouse			
• Restaurant	200 meals	10 gal/meal	2,000
• Golfers			
• Restroom	200	5 gpd	1,000
• Showers	20	25 gpd	500
• Employees	30	15 gpd	450
Overnight Units	45 rooms	150 gpd	6,750
Practice Range	50 golfers	3 gpd	150
Equestrian Center	25 visitors	10 gpd	250
Subtotal			22,000
Contingency			1,000
Total Project			**23,000**

*This does not include the wastewater flows for the golf course maintenance building (approximately 300 gpd) which would be served by an individual septic system.

Mitigation 1. Increased wastewater from the project would be treated and disposed of with new facilities to be constructed in conjunction with the project.

The proposed method of wastewater treatment and disposal for Lion's Gate project involves a central collection, treatment and disposal system for the golf course facilities (except the maintenance facility) and all of the residential development. The various elements of this system are described below and shown in Figure 23 (Revised). For a more detailed description of the treatment system and process, see Preliminary Design Report for the Lion's Gate Reserve Project Wastewater System prepared by Pacific Advanced Civil Engineering in December 1996, which is contained in Appendix N.

~~Septic Tanks: Each residential lot, the clubhouse/overnight complex and the equestrian center would be provided with septic tanks where primary effluent treatment (i.e., sedimentation) would occur. The effluent from the tank would then be piped to centralized treatment and disposal facilities (described below) instead of individual leachfields.~~

~~Collection System: The collection system would consist of a network of small diameter plastic pipes. The flow from the septic tanks to the collection system would be generally by gravity, although some pumping units would be required where septic tanks are at lower elevations.~~

~~Transmission Line/Pump Stations: The collection system would consist of 2 to 4 inch diameter PVC pipe which would convey all septic tank effluent to a central treatment plant, to be located north of the practice range. The collection system would have two major branches: one branch to serve the residential units, equestrian facility and the swim and tennis center; and a second branch to serve the golf course clubhouse and overnight lodging units. Both branches would require a central pump station, located approximately as shown in Figure 23.~~

~~Treatment Facility: As noted above, primary sedimentation is to be provided by the individual on-lot septic tanks. The remaining treatment would be provided by a central treatment plant, to be located adjacent to the practice range. The treatment plant would occupy an area of about 3,000 to 4,000 square feet. The plant would consist of a fully-enclosed proprietary "package" system that would produce secondary level effluent quality. The plant would include the following elements: (a) below ground, built-in-place concrete vaults for sedimentation and clarification; (b) oxidation process for secondary treatment; and (c) liquid chlorination system for disinfection.~~

~~Storage Facilities: The wastewater facilities would include short-term emergency storage and long-term wet weather storage, as described below.~~

~~Short-term Emergency Storage: Short-term emergency storage for one day of peak flow would be provided by underground tanks located alongside the treatment plant, and would have a capacity of 30,000 gallons. Each of the pump stations in the collection system would also have emergency storage capacity, roughly equal to one day of sewage flow from the respective service area, bringing the total emergency storage in the system to about two days of flow. The sewer pump stations would include alarm systems with auto-dialers and standby generator(s) for emergency power. This would ensure continuous pump station operation during power outages or mechanical breakdown of an individual pump. Emergency power would be provided by a dedicated unit at each pump station.~~

~~Long-term Wet Weather Storage: Long-term (90-day) storage of treated wastewater during the wet season would be provided by a storage pond to be located in the "saddle" area immediately upslope and to the northwest of the practice range. The storage pond would be roughly 16-feet deep (at capacity), with an additional two feet of freeboard and an overall maximum water surface area of about 30,000 square feet. The storage volume of the pond at~~

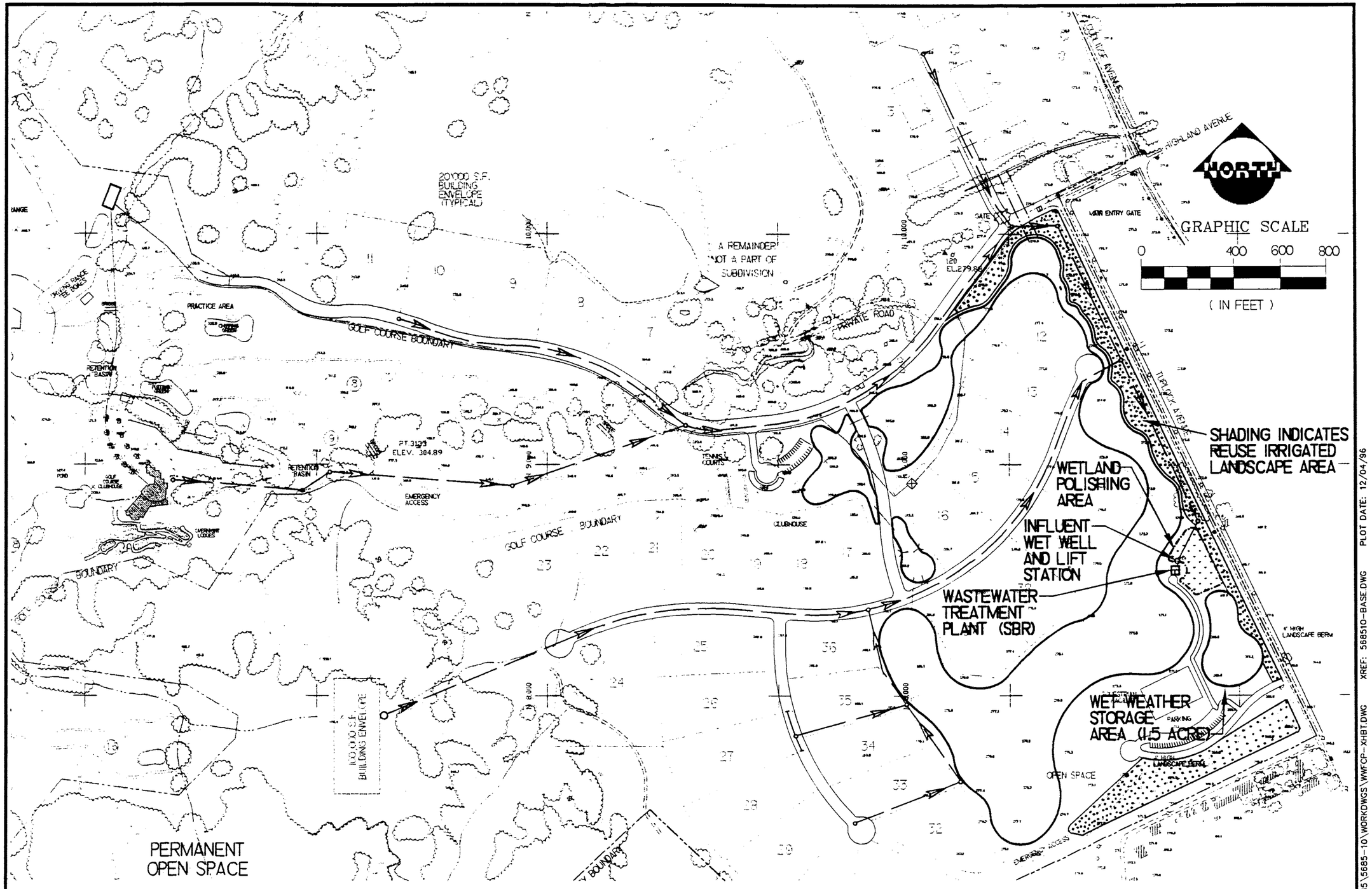

NORTH
GRAPHIC SCALE
0 400 600 800
(IN FEET)
20'000 S.F. BUILDING ENVELOPE (TYPICAL)
A REMAINDER NOT A PART OF SUBDIVISION
PRACTICE AREA
GOLF COURSE BOUNDARY
PRIVATE ROAD
HIGHLAND AVENUE
MAIN ENTRY GATE
TURKEY AVENUE
RETENTION BASIN
PT. 3129
ELEV. 304.89
EMERGENCY ACCESS
TENNIS COURTS
CLUBHOUSE
SHADING INDICATES REUSE IRRIGATED LANDSCAPE AREA
WETLAND POLISHING AREA
INFLUENT WET WELL AND LIFT STATION
WASTEWATER TREATMENT PLANT (SBR)
WET WEATHER STORAGE AREA (1.5 ACRE)
4' HIGH LANDSCAPE BERM
PARKING
OPEN SPACE
10,000 S.F. BUILDING ENVELOPE
PERMANENT OPEN SPACE
LEGEND
GRAVITY SEWER
PACE
PACIFIC ADVANCED CIVIL ENGINEERING
17802 GEORGETOWN LANE, H.B., CA. 92647 (714) 843 5734
LIONS GATE
GILROY, CALIF.
WASTEWATER FACILITIES CONCEPT PLAN
SCALE 1" = 400'
DESIGNED W.P.R.
DRAWN M.J.
CHECKED W.P.R.
DATE 12-05-96
JOB NO. 5685-10
PATH O:\5685\5685-10\WORKDWGS\WWFCP-XHBT.DWG XREF: 5685I0-BASE.DWG PLOT DATE: 12/04/96

FIGURE 23

~~capacity would be approximately 8 acre-feet. The pond would be lined with a clay, plastic or gunite liner to prevent leakage.~~

~~Disposal Facilities: Treated wastewater would be disposed of entirely by spray irrigation of restricted-access turf grass and open space portions of the project. The areas planned for irrigation include the golf course practice range and chipping area, plus about 3 to 4 acres of open-space grassland knolls on the west side of the storage pond (see Figure 23). The overall land area required for irrigation is estimated to be about 12 acres. This is based on the assumption of an 8-month irrigation season (roughly March through November). The calculations are based solely on the evapotranspiration requirements for irrigated pasture; they assume negligible loss of water to percolation. The total volume of reclaimed water to be disposed of during the irrigation season includes the daily wastewater flow during the irrigation season, plus all wastewater and rainfall collected in the storage reservoir during the winter months. The total volume is estimated to be about 28.2 acre-feet in a wet rainfall year.~~

Collection System: The wastewater generated by the residential area and golf course facilities would be collected in 8-inch gravity flow sewers and conveyed to an advanced treatment facility located near the eastern site boundary approximately 200 feet west of Turlock Avenue. This system would collect all of the sewage generated, unlike the system previously proposed where only the effluent was to be collected for treatment with the solids to be settled out in individual septic tanks. Since the wastewater would be collected by gravity flow, there would be no need for individual step pumps, lift stations or force mains as required under the previously proposed system. (Under the proposed system there would be three small pumps, which would all be located at the treatment plant.) This would result in greater system reliability, with less potential for pump failure, and would also represent a substantial savings in both capital costs and ongoing power and maintenance costs. This configuration would also be preferable to the Regional Water Quality Control Board, which had expressed concern with the potential for failure of the numerous pumps previously proposed.

Treatment Facility: The proposed treatment method would involve tertiary treatment utilizing the Sequential Batch Reactor (SBR) process, combined with final treatment at a constructed wetland area nearby. (The principal difference between tertiary treatment and the secondary treatment system previously proposed for the project is that tertiary treatment provides a higher level of filtration for the removal of contaminants, heavy metals and suspended solids, and also provides a higher level of nutrient removal. Under the tertiary treatment process proposed, the treated effluent would contain nitrate concentrations of less than 2 mg/l and a coliform count of less than 2.2/100ml, while secondary treated effluent would contain nitrate levels less than 25 mg/l and a coliform count of less than 23/100ml.) The wetland area would consist of a lined pond two feet deep and planted with wetland species which would provide bio-filtration and biological denitrification. With the tertiary treatment provided by the system, the effluent would meet or exceed Title 22 Reclaimed Water Class II standards for restricted access recreational impoundments.

Since the proposed treatment process would handle all of the sewage generated, the solids would settle out as sludge. (Under the previous proposal, the solids would be retained in individual septic tanks and periodically pumped out and hauled away by tanker trucks.) In the proposed SBR system, the sludge remaining from the treatment process would be periodically removed by tanker truck for disposal and treatment at a municipal wastewater treatment plant, as occurs with septic tank sludge. Sludge removal would occur every three months, when approximately 3,000 gallons of sludge would be removed. Since both the treatment process and sludge storage would occur underwater within a totally enclosed building, and since the treatment process involves a significant amount of aeration, the potential for odor generation is minimal. (See discussion under 'Impact 5' below.)

As mentioned, the treatment plant would be located near the southeast corner of the site to take advantage of gravity flow and reduce pumping requirements. The entire treatment facility, including disinfection tanks, sludge ponds, and controls, would be housed in a one-story building with a low-profile barn-like or residential appearance. The treatment facility

would occupy an area measuring 40 feet by 40 feet, and the adjacent constructed wetland would be approximately .75 acres in area (see Figure 2 in the report by Pacific Advanced Civil Engineering, contained in Appendix N). An SBR treatment plant similar to the one proposed has been in operation at the Ciello Vista Estates project in Hollister since 1989. That facility currently serves 76 residences and treats approximately 50,000 gallons of wastewater daily, about double the volume of the proposed treatment facility for the Lion's Gate project. That facility appears as a dwelling located within a residential neighborhood, with the nearest house located 100 feet away. Photographs of this facility are provided in Figure 23a.

Emergency Power Supply: In the event of an extended power failure, back-up power supply would be provided in the form of either a portable diesel generator or an in-place propane generator.

Short-term Emergency Storage: Short-term emergency storage for 24 hours of peak flow required by Title 22 would be provided by the sludge containment pond. In an extreme emergency, an additional 20 days of emergency storage could be provided by the lined constructed wetlands.

Long-term Wet Weather Storage: Long-term (120-day) storage of treated wastewater during the wet season would be provided by a dedicated effluent storage pond to be excavated to the west of the treatment plant. The pond would appear as part of the residential lakes proposed for this area, but in fact would be a separate impoundment. The pond would have a capacity of 6.4 acre-feet and would occupy 1.75 acres. The pond would be lined with either clay or PVC depending on soil suitability; the liner would be backfilled with a minimum of 18 inches of soil and landscaped to blend in with the surrounding area.

Since the pond would contain tertiary treated effluent, it would meet or exceed the Title 22 standards for restricted access recreational impoundments. This means that the level of treatment would be sufficient to allow incidental body contact but not total body contact. The lake and irrigated areas would be posted with the required signage for usage of reclaimed water. (See discussion under 'Impact 3' below.)

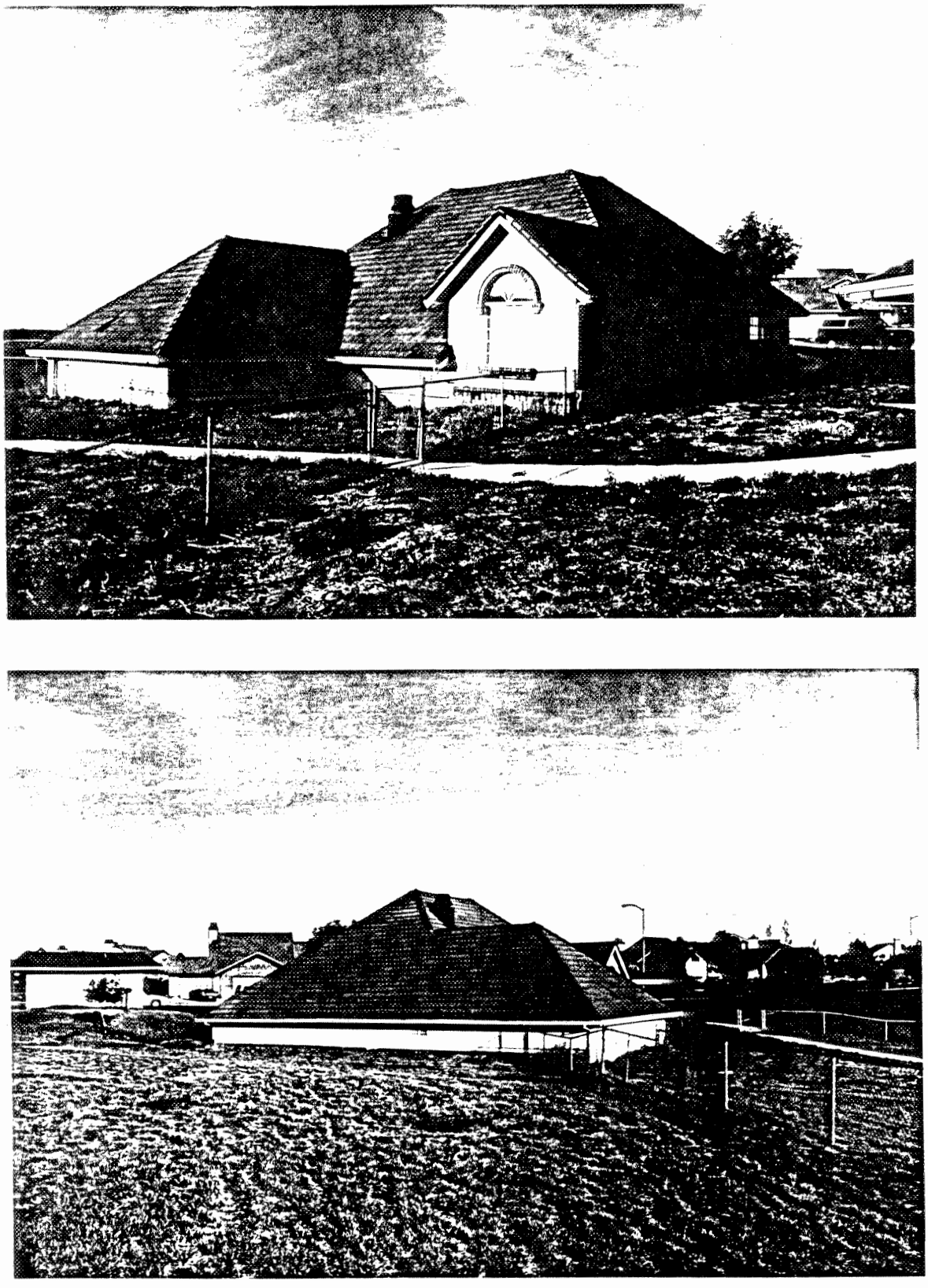
Effluent Disposal: The treated effluent would exceed the required level of disinfection for unrestricted landscape irrigation, and would be applied over the frontage landscaped area. It is estimated that enough reclaimed water would be generated to provide irrigation water for 8 acres of landscaped area.

Solids Disposal: Every three months, approximately 3,000 gallons of liquid sludge would be transported by tanker truck to a nearby large scale municipal treatment facility for sludge processing and disposal. Sludge processing is an ongoing process at large-scale facilities with belt presses and/or sludge drying beds. The transported sludge is highly aerated and easily introduced into the processing system. The previously proposed system of septic tanks would also require hauling of septage to nearby treatment facilities. However, septage is in an anaerobic condition and is not compatible for easy disposal in most activated oxygen type treatment facilities. The facilities have to introduce the septage slowly, so as not to upset the balance in the treatment system biomass. Therefore, disposal of sludge is generally less problematic than disposal of septic tank septage. Preliminary discussions with representatives of the South County Regional Wastewater Authority indicate that the nearest municipal wastewater treatment plant at Gilroy should have no technical difficulty accepting the relatively small quantity of sludge generated by the project. However, acceptance of the project's sludge for treatment and disposal is subject to approval by the Board of Directors for the Authority (Jay Baksa, Authority Manager, personal communication).

Facility Operation and Maintenance: The proposed community wastewater system would be owned and operated by the Community Services District (CSD) established for the project. Since the system would generate more than 2,500 gallons of effluent per day, it would be under the jurisdiction of the Central Coast Regional Water Quality Control Board; as such, the

SEQUENTIAL BATCH REACTOR TREATMENT PLANT

Hollister, California



100,000 gallon per day facility in residential neighborhood, enclosed in house structure
Fluidyne, Inc. SBR Equipment

FIGURE 23a

system would require a waste discharge permit from the Regional Board. The CSD would be the responsibility party (i.e., "discharger") named in the Waste Discharge Requirements (i.e., permit) issued by the Regional Board for the facility. Actual day-to-day operations could be performed by employees of the CSD or by contractors. However, the CSD would have ultimate responsibility for compliance with the Waste Discharge Requirements and the submittal of monitoring reports to the Regional Board.

With respect to day-to-day operations, Title 22 of the California Administrative Code contains specific requirements for monitoring, record keeping and treatment plant maintenance to assure public health protection. A certified wastewater treatment plant operator would be required for the treatment plant. It is anticipated that testing and regularly scheduled maintenance would require less than 20 hours per week for a well-trained individual with maintenance help as required. The SBR equipment manufacturer would provide a detailed operation and maintenance manual including regularly scheduled maintenance items such as dissolved oxygen sensor calibration. Additionally, the Santa Clara County Sewage Disposal Ordinance requires that community wastewater systems be monitored by the designer for one year, and that the operator execute a maintenance contract with a sanitary engineering firm for the first 5 years of system operation.

Maintenance Facility

The maintenance facility would not be connected to the centralized wastewater system, but would have its own septic tank and leachfield system. Based on a generation rate of 15 gpd for 15 employees, maximum flows would be 225 gpd. Preliminary soils and groundwater studies indicate that there is adequate depth to groundwater, and that the soils in the vicinity have acceptable percolation rates for the planned leachfield.

Alternative Wastewater Treatment Configurations

Several alternative methods of wastewater treatment and disposal were studied for the Lion's Gate project, as described below.

Individual Residential Septic Systems: The main alternative to the proposed wastewater system would include: a) the use of individual septic systems for each residential lot (and the equestrian center, and the swim and tennis center); and b) a separate package treatment plant, storage pond and spray irrigation system solely for the golf course clubhouse and lodging units. This alternative is feasible as studies to date have verified adequate soil depth/groundwater conditions to support individual septic systems at the residential building sites. The layout of the residential sites has been planned to match the septic system options and limitations. A package treatment plant system for the golf course facilities is also feasible. It would be about one-half the size and capacity of the proposed wastewater system to serve the entire development. The advantages of the proposed wastewater plan over this option of utilizing residential septic systems are as follows:

- All wastewater treatment and disposal would come under the maintenance and management authority of a public district and certified wastewater personnel;

- A greater percentage of the wastewater would be made available for reclamation and reuse for irrigation of a portion of the golf course (the practice areas), reducing the demand on other irrigation water sources; and,

- The overall nitrate loading from the project would be reduced, since the secondary treatment followed by irrigation removes a substantially greater amount of nitrate than do individual septic tank-leachfield systems. The use of package treatment plants with spray irrigation is identified as a nitrate control management objective in the Santa Clara Valley Water District's draft plan for the Llagas Groundwater Basin.

~~The one advantage of the individual residential septic system option would be the elimination of the effluent collection system (and its associated pump stations and piping) in favor of a simple, on-site gravity flow system at each house.~~

~~Conventional Gravity Sewers: Conventional gravity sewers, as opposed to effluent-only sewers, were considered as a system design option. Conventional sewers would eliminate the need for a septic tank at each house/building, but the construction costs and excavation requirement for larger diameter gravity sewers, manholes and lift stations spread over the development area would offset the savings. The on-site treatment plant could be designed to accommodate either effluent or raw sewage from a conventional sewer system. If conventional sewers were to be used, an additional screening and sludge handling process would be included at the treatment plant. Ultimately, disposal of the sludge would be by hauling to an approved landfill site. An advantage of the system design proposed for the project is the ability to build-in surplus storage or emergency disposal capacity at the stations or individual building sites with the use of subsurface leachfield trenches. This is possible because of the inclusion of septic tanks for primary treatment at each house/building. Septic tank effluent can be disposed in appropriately sited leaching trenches, but raw sewage cannot.~~

Effluent-Only Sewers and Secondary Treatment: Effluent-only sewers were previously proposed for the project. Instead of collecting all sewage for treatment at a central treatment plant, this would entail the installation of individual septic tanks, but not leachfields, at each homesite, and also at the clubhouse and overnight accommodations complex. The septic tanks would provide primary effluent treatment (i.e., sedimentation) with the effluent from each tank piped to the treatment plant for further treatment. One benefit of this collection system is that it reduces construction costs due to the smaller diameter pipes, and it provides additional emergency storage capacity in the individual septic tanks. Effluent-only sewers are less attractive when the collection system operates entirely by gravity, as is currently proposed, where reduction of pumping costs is not a consideration. In addition, effluent-only sewers require regular pumping of septic tanks at individual homesites and golf facilities, which involves some inconvenience to homeowners and the golf course operator.

From an environmental standpoint, this alternative would achieve far less removal of nitrates than the system proposed. Since the wastewater would receive only secondary treatment, the total nitrogen concentration in effluent from the treatment plant would be approximately 25 mg/l, although natural denitrification at the storage pond would be expected to reduce this to 3 to 4 mg/l at the time of final discharge to the irrigation system. In the proposed system, the wastewater would receive tertiary treatment, resulting in the removal of total nitrogen to less than 2 mg/l.

Municipal Sewerage: The possibility of extending sewer service from the City of Morgan Hill to the project site was considered in connection with prior development plans for the project site. The project site is not within the sewer service area for the Morgan Hill/Gilroy Wastewater Treatment Plant and would require annexation and several miles of sewer pipeline construction. Due to the relatively small wastewater flows from the Lion's Gate project, and the substantial distance to the Morgan Hill/Gilroy system, sewer connection to the system would not be a practical alternative.

Impact 2. **The proposed wastewater disposal facilities may result in degradation of surface and groundwater quality. (Potential Significant Impact)**

Under proper operation, the proposed disposal of wastewater to land should not result in any noticeable impacts on surface water quality in local drainages or the West Branch of Llagas Creek. This is because the system would be subject to the Regional Board's standard requirement that there be no runoff of wastewater from any spray disposal area into streams or drainages; and the spray disposal operations are planned to be confined to the irrigation season only. To further minimize the risks of reclaimed water runoff into streams, the

proposed spray areas are to be set back 100 feet or more from local drainages. (Note: Treated effluent would be applied to the spray irrigation area at rates matching the evapotranspiration rate of the practice range turfgrass. Also spray irrigation would not occur during the winter months when the turfed areas are likely to be saturated. Thus, there is no potential for treated effluent to leach or run off into on-site drainages.)

A critical water quality concern in the Llagas Groundwater Basin area, where the Lion's Gate project is located, is the concentration of nitrate in groundwater. The Llagas Groundwater Basin has documented high levels of nitrate attributable to agricultural wastes and fertilizer, wastewater disposal and other land use activities. Sources of nitrate loading from the Lion's Gate project would include golf course fertilizers and on-site wastewater disposal. The nitrate analysis for golf course fertilizers prepared by Audubon Conservation Services (see Appendix E), estimated an annual nitrogen loading ranging from 262 lbs to 1,965 lbs of nitrogen, with a resultant nitrate-nitrogen concentration ranging from 0.6 mg/l to 4.5 mg/l reaching the groundwater. The mass nitrate-nitrogen loading from wastewater disposal is estimated conservatively to be about ~~263~~ 21 lbs per year. The combined total nitrogen loading for golf course fertilizers and wastewater disposal is estimated to be ~~525~~ 283 to ~~2,228~~ 1986 lbs per year, which equates to projected groundwater concentration of ~~1.2~~ 0.7 mg/l to ~~5.1~~ 4.6 mg/l. (The equivalent concentration as NO3 would be from ~~5~~ 3 to ~~23~~ 20 mg/l.) These nitrate loading calculations are a prediction of long-term cumulative nitrate levels resulting from the project, based on average annual conditions.

The nitrate loading analysis is based on very conservative (i.e., worst case) assumptions for the nitrogen content of treatment plant effluent (25 mg/l), nitrogen removal rate in the storage pond (40%), and uptake by the soils and vegetation (75%). Higher nitrogen removal rates are attainable with plant design (e.g., Sequencing Batch Reactor or SBR) or through an operating mode specifically selected to optimize nitrogen removal. A good example of the latter is the Las Palmas Ranch Wastewater Reclamation plant in Monterey County, which has a waste discharge limit of 10 mg/l nitrate-nitrogen set by the Central Coast Regional Water Quality Control Board. The total nitrogen concentration in effluent from the treatment plant ranges from 18 to 24 mg/l (as compared with our estimate of ~~25~~ 2 mg/l); ~~but, the final discharge from the storage pond is typically in the range of 3 to 4 mg/l, due to denitrification in the pond. Uptake by turf grass and soils in the irrigation area further reduces the concentration of nitrate-nitrogen reaching groundwater (probably to 1 to 2 mg/l, or less). Based on the demonstrated performance of the Las Palmas Ranch facility, reduction of nitrate concentrations to very low levels, e.g., a few mg/l, is feasible; however, a "zero nitrate discharge" is not an achievable or realistic standard.~~ given the very low nitrate levels in the treated effluent, any additional denitrification in the effluent storage pond would be negligible.

The existing groundwater nitrate concentrations in the vicinity of the project site (at San Martin), as reported in the SCVWD Llagas Groundwater Basin Nitrate Study (November 1995), are indicated to be in the range of about 7 to 43 mg/l (as NO3). Historic sampling of a water well on the project site is also reported to fall within this range. The Lion's Gate project site is currently used for cattle grazing; and nitrogen associated with cow manure and urine represents the main current source of nitrate loading to groundwater and surface water runoff. Generally, in pasture and rangeland situations the majority of nitrogen in animal wastes is readily assimilated into the soil and vegetation. However, where soils are damp, where animals congregate and where they have direct access to streams and other drainages, a portion of the nitrogen will be carried by runoff or percolate into the groundwater. These are likely the current routes of nitrogen input to the Llagas Groundwater Basin from the project site.

Under the proposed project, the cattle grazing is planned to be entirely eliminated in favor of the golf course and residential development. From a nitrogen loading standpoint, the turf fertilizer and reclaimed wastewater would essentially replace animal wastes as the principal source of nitrate on the project site. Because of the slow rate of groundwater movement, it is likely to take several years for any changes in water quality to be noticeable. Moreover, as

indicated by the water-chemical mass balance analysis in the wastewater feasibility study, the nitrate loading (in terms of resultant concentration) from the project is estimated to be roughly comparable to existing background groundwater conditions (i.e., ~~5~~ 3 to ~~23~~ 20 mg/l under project conditions, versus 7 to 43 mg/l under existing conditions). Thus, any long-term change in groundwater nitrate concentration is likely to be very slight and difficult to discern.

There is a slight possibility of leakage or spill of wastewater during a major earthquake. However, since the package wastewater treatment plant facilities would consist largely of below ground tankage, the potential consequence of failure or release of wastewater during an earthquake would likely be insignificant. In the unlikely event of a spill, wastewater would be directed to the lined wetland area nearby which has many times the storage capacity of the treatment plant. However, this is a valid issue which would be covered in the "Contingency Plan," which is a standard element of the Waste Discharge Requirements that would be adopted for the wastewater facilities by the Regional Water Board.

Mitigation 2. Groundwater wells would monitor groundwater quality up-gradient and down-gradient of the proposed spray irrigation area, with corrective action taken as necessary.

Groundwater at the project site would be monitored as a precautionary measure in connection with the wastewater disposal systems and the golf course maintenance activities. All of the existing water wells on the property and the new proposed irrigation well would be periodically monitored for nitrate. Additionally, a dedicated monitoring well immediately down gradient (east) of the wastewater spray field areas (practice range and chipping areas) would be added to distinguish possible localized effects from the wastewater systems. The Regional Board may also require that additional monitoring wells be installed. This would provide a basis for detecting any changes over time and for making adjustments in fertilizer application rates or wastewater operations. ~~In the unlikely event that evidence of contamination is found, corrective action could include incorporating additional treatment processes to further reduce nitrate levels prior to disposal.~~ (The specific measures to be taken would be stipulated in the "Contingency Plan" for the treatment operation, which is a standard element of the Waste Discharge Requirements contained in the "permit" from the Regional Board.) In addition, surface water upstream and downstream of the spray irrigation area would also be monitored for water quality.

Impact 3. The use of reclaimed wastewater for ~~golf course~~ landscape irrigation and storage of the treated effluent near the residential area ~~would~~ could expose humans to possible physical contact with the treated wastewater, resulting in a potential public health hazard. (Potential Significant Impact)

~~The areas planned for spray disposal of treated effluent include the golf course practice and chipping area and the grassy hillside knolls adjacent to the proposed wastewater storage pond.~~

Unlike secondary treatment previously proposed, the tertiary treated water in the current proposal can be used for unrestricted landscape irrigation. Since incidental body contact with this level of treated effluent is permissible under Title 22, the public health risk to residents making casual contact with the irrigation water would be virtually nil.

Unlike the storage pond for secondary treated effluent previously proposed, the storage pond for tertiary treated effluent currently proposed would be 'a restricted access recreational impoundment' under Title 22, where incidental body contact would be permitted but total body contact would not. Thus there would be a some public health risk in the unlikely event that individuals were to engage in total body contact activity in the lake, such as swimming.

~~**Mitigation 3. The wastewater would be treated to levels deemed acceptable for disposal on golf courses, and the areas affected would be posted to notify golfers and employees where irrigation by treated wastewater is occurring.**~~

~~State wastewater reclamation criteria recognize golf course irrigation as a suitable use for treated wastewater, and contain standards to protect against unacceptable risks to public health. The areas to be irrigated with treated wastewater would have restricted access and activities, and limited opportunity for human contact with the treated wastewater. The areas of the golf course proposed for irrigation are the practice range, which would be accessible primarily to maintenance staff, and the chipping area, which would have more general accessibility to the golfers. Both areas should be posted with appropriate signs indicating the irrigation with reclaimed water; and irrigation of these areas would need to be limited to times when people are not present, i.e., evenings. The other areas planned for irrigation are grassland knolls that are well removed from general public access. These sites would be part of the permanent open space area and would be accessible to an occasional hiker or horseback rider. Evening spray disposal in those areas is also recommended.~~

~~With diligent compliance with waste discharge requirements, the risks to public health would be minimal. However, if desired, the wastewater system could be upgraded and operated to meet the treatment standards for unrestricted landscape irrigation, as defined in Title 22 of the California Administrative Code.~~

Mitigation 3. **The wastewater would be treated to tertiary levels which is acceptable for unrestricted landscape irrigation. Signs would be posted at the irrigated landscape area and at the effluent storage pond to notify residents of the presence of reclaimed water.**

Since the tertiary level of treatment proposed would result in coliform counts of less than 2.2/100ml, compared with 23/100ml for secondary treatment, there is far less concern with incidental contact with contaminants. Since the reclaimed water would be quite clean, there is no State requirement to fence-off irrigation areas to prevent human incursion. However, signs would be posted within the irrigated landscape area to inform residents that reclaimed effluent is being used. In addition, signs would be posted around the effluent storage pond indicating its use for reclaimed water storage and warning that swimming is not permitted.

Impact 4. **There is a potential for overflow of the storage reservoir, resulting in a public health hazard. (Potential Significant Impact)**

There is the possibility of an overflow from a wastewater storage reservoir during high rainfall years, if the reservoir capacity is exceeded.

Mitigation 4. **The wastewater storage reservoir would have sufficient capacity to accommodate high rainfall years.**

To minimize or eliminate the possibility of overflow, the reservoir would be sized to include: (a) surplus storage capacity to account for extreme wet weather effects; and (b) two-feet of freeboard in the pond above the projected maximum water depth (which is substantially greater than the amount of rainfall expected in the 100-year/24-hour storm). The calculated winter storage requirement is based on ~~90~~ 120 days with no irrigation. An additional contingency available for a wet winter would be selective spray disposal during the rainy season. In particular, the grassland knolls near the reservoir site would provide suitable winter spray disposal capacity for emergency use without posing a threat of runoff to streams or ponding of treated wastewater in public use areas. In the future, should the wastewater flows exceed the system design, the capacity of the wastewater storage pond could be expanded. Additionally, a reserve leachfield area could be constructed near the treatment plant or pump stations for emergency use.

Impact 5. **The wastewater treatment and disposal system could generate odors. However, since the SBR process proposed involves no odor-producing anaerobic digestion and would be entirely enclosed, no noticeable odors would be generated.**
~~**(Potential Significant Impact)**~~ (Less-than-Significant Impact)

~~Odors could be generated within the immediate vicinity of the two main pump stations and at the treatment plant. At the effluent storage pond, odors could be created by algae which could grow in the nutrient laden water.~~

Since the SBR treatment process occurs entirely under water and involves a significant amount of aeration, the potential for odor generation is minimal. In conventional treatment processes, odors are created because the process relies on digestion by methane-producing anaerobic bacteria which exist under conditions where oxygen is absent. The SBR process does not include anaerobic bacteria but relies an digestion by aerobic and anoxic bacteria which do not produce odor-generating methane. Additionally, the constant aeration involved in the SBR process prevents the creation and proliferation of anaerobic bacteria. Also, the sludge would be in an aerated liquid state while on-site and when removed for disposal, thus further reducing the potential for odor problems. No drying or composting of sludge would occur on-site. Instead, the stored sludge would be transferred directly from underwater storage to tanker trucks for disposal at an approved wastewater treatment facility. The entire treatment facility would be completely enclosed in a structure to further eliminate the potential for odor dispersion. As an example, the SBR treatment plant at the Ciello Vista Estates project in Hollister has received no odor complaints since it began operating in 1989 (Ed Lantz, Water Technologies Inc., personal communication). As mentioned, that facility treats approximately 50,000 gallons of wastewater daily, about double the volume of the proposed Lion's Gate facility, and is located 100 feet from the nearest residence, while the Lion's Gate facility would be approximately 400 feet from the nearest existing or proposed dwellings.

The potential for odors to be generated by algae that might form in the constructed wetland area is minimal. The nutrient levels of the effluent entering the wetland would be low and the wetland plants would compete for the sunlight that the algae need. In addition, stagnant water conditions would be avoided by the continuous circulation of water and periodic variations in water levels. There is virtually no potential for algae formation in the effluent storage pond since the nitrate levels in the lake would be below 2 mg/l after final treatment.

Since the proposed system contains no pump stations outside the treatment plant site, the potential for odor generation in the sewage collection system is minimal.

~~**Mitigation 5. Odor control would be achieved by mechanisms incorporated into the design of the pump stations and the treatment plant, and by measures to be undertaken at the effluent storage pond.**~~

~~Odor control at the pump stations would be achieved by venting through subsurface soil "scrubber" trenches, or above-ground activated carbon canister-type filters. If properly maintained, these measures can be expected to reduce pump station odors to a level of insignificance.~~

~~To eliminate odors at the treatment plant, the plant would be designed to capture and eliminate methane and hydrogen sulfide odors with a vacuum system, and with soil filtration.~~

~~Control measures for algae include: (a) aeration of the wastewater pond; (b) addition of chemicals such as non-toxic dyes; and (c) promotion of duck weed to block light penetration. With proper maintenance attention, these measures can be effective in reducing algae problems to less-than-significant levels.~~

Mitigation 5. No mitigation required.

Impact 6. The existing pond and the proposed open water areas of the project, such as the wastewater storage pond and the residential lake, have the potential to be sites for breeding of

mosquitoes, which could create a nuisance and a potential public health problem. (Potential Significant Impact)

Mitigation 6. **Mosquito breeding would be controlled by several methods, as appropriate for each type of water body. These methods would include the circulation of water to prevent stagnant conditions, the introduction of mosquito fish, and the application of larvacides. The specific mosquito mitigation measures would be formulated in consultation with the Department of Environmental Health Vector Control District.**

~~At the wastewater storage pond, the water would be circulated through the pond, with a portion removed each day for irrigation.~~ Both the constructed wetland and the effluent storage pond would be prevented from becoming breeding areas for mosquitoes and other insects by keeping the water circulating. The turnover and movement of water would interfere with the mosquito breeding cycle during the warm months. ~~The potential mosquito problem would also be minimized by the remote location of the storage pond which is well away from any residences or golf activity areas.~~ At both the effluent storage pond and the constructed wetland, mosquito fish would be appropriate since they would be within a closed system with no potential for the fish to escape. At the existing pond in the central area of the site, and at the proposed lakes for the residential area, the introduction of mosquito fish and the circulation of water would not be appropriate measures for mosquito abatement. Since both of these water bodies would have outlets to West Branch Llagas Creek, the introduction of mosquito fish would risk the escape of the fish resulting in potential disruption of native species. For these ponds, mosquito abatement may require the use of one or more of the following three larvacides: lightweight oil, BTI and methoprene, which can be applied by air or with ground equipment. The oil, which contains surfactants, forms a very thin film on the water surface and essentially suffocates both the larval and pupal stages of the mosquito. The oil tends to dissipate within three or four days, depending on weather conditions. BTI *(Bacillus thuringlensis israelensis)* is a naturally occurring bacterial pathogen of mosquitoes. It is most effective against the larval stages and is approved for use in sensitive habitats by the U.S. Fish and Wildlife Service. Methoprene is an insect growth regulator which prevents the mosquito from developing from the pupal to the adult stage. Extensive research has demonstrated that methoprene has very little impact on non-target organisms, and the U.S. Fish and Wildlife Service has approved its use in sensitive habitats, such as the habitat of the endangered Santa Cruz long-toed salamander.

Prior to design and construction of the new ponds, the Department of Environmental Health Vector Control District would be consulted to ensure a design that will inhibit the development of mosquito breeding.

Impact 7. **The location of the treatment plant near Turlock Avenue could result in potential noise impacts to existing and proposed residences in the vicinity. However, the pumps and aerators at this treatment plant would be largely submerged and entirely enclosed within a building, thus minimizing noise. (Less-than-Significant Impact)**

In addition to being submerged and enclosed, the aerators would also have mufflers and would be located at least 400 feet from the nearest existing or proposed dwellings. (At the Ciello Vista project in Hollister, noise from the SBR treatment plant is inaudible at the nearest dwellings located 100 feet away.)

Mitigation 7. **No mitigation required.**

Impact 8. **The location of the treatment plant in proximity to existing and proposed dwellings could expose residents to potential release of hazardous materials used in the treatment process. However, this treatment plant would not involve the use or generation of hazardous materials. (Less-than-Significant Impact)**

Although chlorine is often used in the disinfection stage of wastewater treatment, chlorination will not be utilized here. Instead, disinfection will be accomplished by the use of ozone and/or ultraviolet which are not hazardous materials. By not using chlorine there also would be no need for the chemicals used in dechlorination. In addition, there would be no creation of toxic trihalomethanes (THMs) or other chlorine by-products. The treatment process would not involve the use or generation of any hazardous materials.

Mitigation 8. **No mitigation required.**

Conclusion. **With the installation of the proposed wastewater facilities in accordance with applicable standards, and with the implementation of the mitigation measures set forth above, the potential wastewater and related impacts resulting from the project would be non-significant or would be reduced to less-than-significant levels.**

V. ALTERNATIVES TO THE PROPOSED PROJECT

*

*

G. ALTERNATIVES FOR WASTEWATER TREATMENT AND DISPOSAL

*

*

*

~~**Conventional Gravity Sewers**~~

~~This alternative would involve placing the entire project on conventional gravity sewers. Thus there would be no individual septic tanks at the residential lots of the golf course facilities. The treatment plant would therefore include an additional screening and sludge handling process, with disposal of sludge at an approved landfill site. Also, the treatment plant would require additional emergency storage, to make up for the extra storage provided by the septic tanks and lift stations under the proposed system.~~

~~Since this system would not utilize individual leachfields, the potential nitrate loading would be about the same as for the proposed treatment system. However, the centralized handling and screening of solids at the treatment plant site would result in a greater potential to generate unpleasant odors than the proposed system.~~

~~In other respects, there would be no significant difference in environmental effect between the conventional gravity sewer alternative and the proposed wastewater system.~~

Effluent-Only Sewers and Secondary Treatment

Effluent-only sewers and secondary treatment were previously proposed for the project. Instead of collecting all sewage for treatment at a central treatment plant, this would entail the installation of individual septic tanks, but not leachfields, at each homesite, and also at the clubhouse and overnight accommodations complex. The septic tanks would provide primary treatment (i.e., sedimentation) with the effluent from each tank piped to the treatment plant for further treatment. The process would include secondary treatment, and the effluent would be disinfected to remove most of the pathogens, but the tertiary steps of filtration and denitrification would not be included.

One benefit of this collection system is that it reduces construction costs due to the smaller diameter pipes, and it provides additional emergency storage capacity in the individual septic tanks. Effluent-only sewers are less attractive when the collection system operates entirely by gravity where reduction of pumping costs is not a consideration. In addition, effluent-only sewers require regular pumping of septic tanks at individual homesites and golf facilities, which involves some inconvenience to homeowners and the golf course operator.

From an environmental standpoint, this alternative would achieve far less removal of nitrates and coliform bacteria than the system proposed. Since the wastewater would receive only secondary treatment, the total nitrogen concentration in effluent from the treatment plant would be approximately 25 mg/l, although natural denitrification at the storage pond would be expected to reduce this to 3 to 4 mg/l at the time of final discharge to the irrigation system. In the proposed tertiary treatment system, the total nitrogen contained in the effluent would be less than 2 mg/l. In addition, the coliform count in the tertiary treated effluent would be less than 2.2/100ml, while secondary treated effluent would contain a coliform count of approximately 23/100ml.

In other respects, there would be no significant difference in environmental effect between the effluent-only sewer and secondary treatment alternative and the proposed wastewater system.

Appendix D

Hydrology and Drainage Report

Prepared By

Pacific Advanced Civil Engineering

November 1996

PRELIMINARY DESIGN REPORT

for the

LION'S GATE RESERVE

MASTER DRAINAGE PLAN

Prepared By:

Pacific Advanced Civil Engineering
17902 Georgetown Lane
Huntington Beach, CA 92647

November 22, 1996

#6785

Date: 11/20/96
Job #: 6785E
By: PACE

1. Project Purpose and Need

The enclosed proposed modifications to the project drainage plan are submitted to enhance the previously submitted EIR drainage plan. Similar to the previous plan, the proposed modifications include runoff detention facilities to ensure no increased potential for downstream flooding as a result of the project. In fact, the proposed plan includes more aggressive flood control measures in response to the County's request that the project do more to help alleviate the significant flooding problems that currently exist downstream of the project site.

2. Off-site Drainage

The West Branch of Llagas Creek tributary drainage area (up stream of Coolidge Avenue) includes a majority of the Lion's Gate Reserve Project site. The West Branch of Llagas Creek exits the project site in the easterly boundary just north of the intersection of Coolidge Avenue and Highland Avenue. According to the Santa Clara County drainage engineering section, the West Branch of the Llagas Creek causes significant flooding of areas downstream of the Lion's Gate Reserve project. Therefore, it is critical that on-site developed conditions do not increase the downstream drainage flooding.

In an effort to not only mitigate on-site drainage runoff, but to substantially reduce the downstream flooding, the Lion's Gate Reserve project is proposing the following regional drainage solutions:

A. Provide storm runoff detention via proposed on-site lake/detention system for 10 to 100 year rainfall events.

1. Construct West Branch Llagas Creek stream diversion structure to divert flows above the 10-year event into the lake/detention basin. The proposed diversion structure will consist of a concrete "L" Section in plain view with an open channel conveyance for flows in Llagas Creek for up to 400 cfs. Flows in excess of 400 cfs will pass over side spillway weir to the south and be conveyed to the lake/detention basin. At a high water level of elevation 275, the detention basin will not accept additional run-off and flows in excess of the 100 year storm will overtop the Llagas Creek diversion structure and continue on in the historic flow path.

2. Store ± 45 acre feet of runoff from the West Branch of Llagas Creek in ± 2.5 foot freeboard of the proposed ± 17 acre Lion's Gate Reserve lake/detention system.

3. The result of the proposed detention will be to reduce the existing 100-year peak flow rate as it exits the Lion's Gate Reserve site from ± 800 cfs to ± 400 cfs. This will reduce 100-year runoff peak flows to approximately the 10-year runoff condition which is a substantial reduction and significantly reduce downstream flooding problems.
4. The lake/detention area will be excavated and a normal lake water surface maintained at elevation 273.0. The flood waters will be conveyed by the proposed lake/stream/channel system along Turlock Avenue. The lake/detention system will store the runoff up to elevations 275.5 at which point the inlet stream/channel will back-up and not allow additional runoff to enter the lake system; thus forcing flows in excess of the 100-year event down the Llagas Creek.

2. On-site Drainage

The on-site drainage improvements include the following elements:

1. Routing of urban runoff to detention/retention or lake areas prior to any discharge to the West Branch of Llagas Creek. The on-site drainage system will include roadway catch basin collection system and discharge to drywells at the lake perimeter prior to overflow to the lake system.

2. Individual lot drainage, as part of the master drainage plan, will be prepared to minimize any cross lot drainage to adjacent lots and to determine detailed on-site drainage system requirements.

3. Riparian Area Avoidance and Enhancement

The proposed drainage plan will minimize impacts to the existing waters of the U.S. surrounding Riparian Areas. The proposed lake/detention basin will be utilized to provide additional riparian and open water areas.

4. Master Drainage Plan

A master drainage plan for the Lion's Gate project will be prepared in accordance with the proposed project plans. The master drainage plan will include the following elements:

A. Hydrologic modeling, for pre and post developed conditions, (HEC-1 for the off-site drainage area and rational method for the on-site drainage areas) for determination of rainfall runoff peak flow rates, runoff volumes and time of concentrations for various storm frequencies (2, 10, 50 and 100 year events).

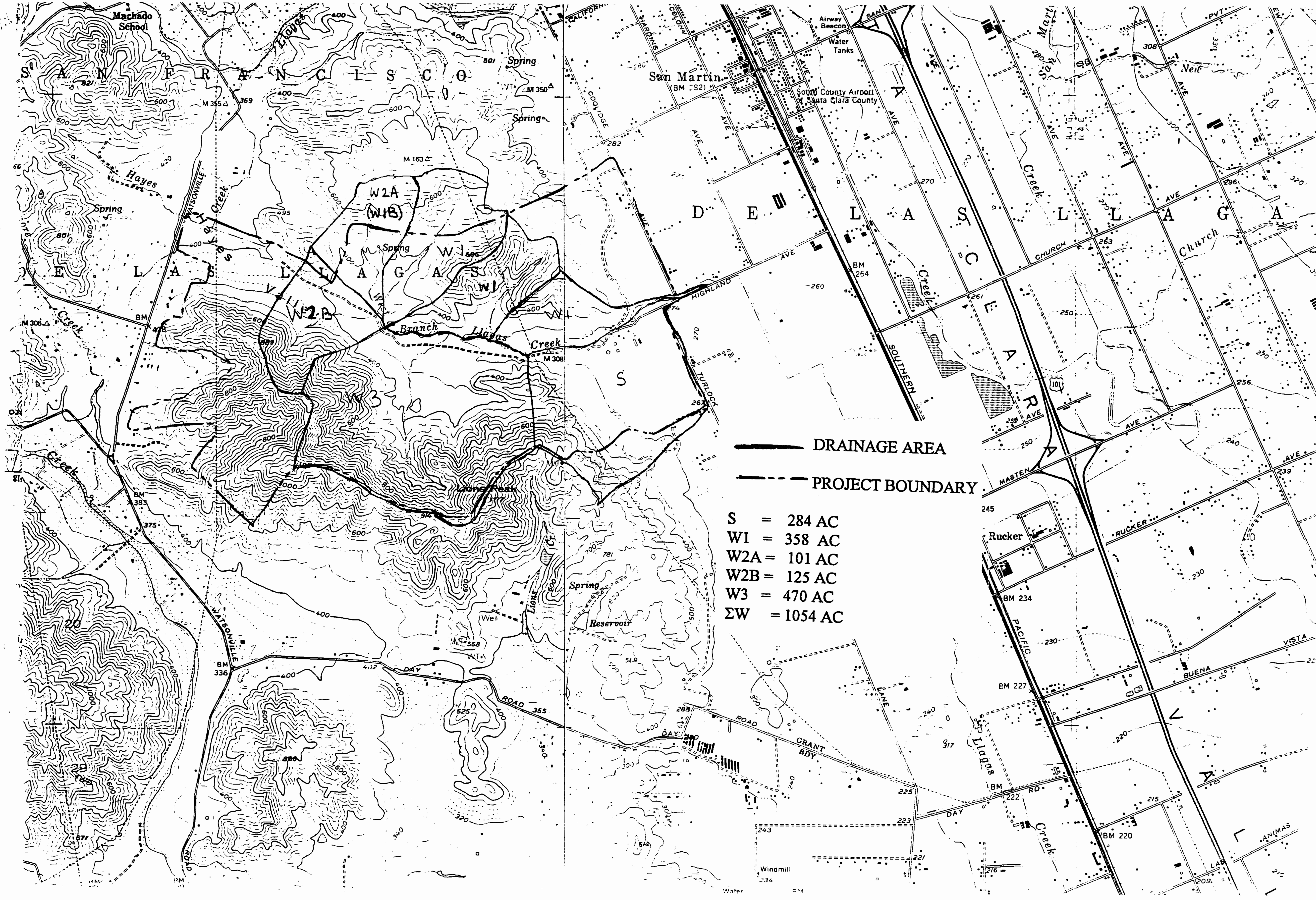
B. West Branch Llagas Creek hydraulic modeling HEC-1 and HEC-2 for determination of existing and proposed condition creek water surface profiles and proposed detention basin routings.

C. On-site and off-site drainage plan which coordinates with the project site plan regarding runoff routing and sizing of storm culverts and other hydraulic features.

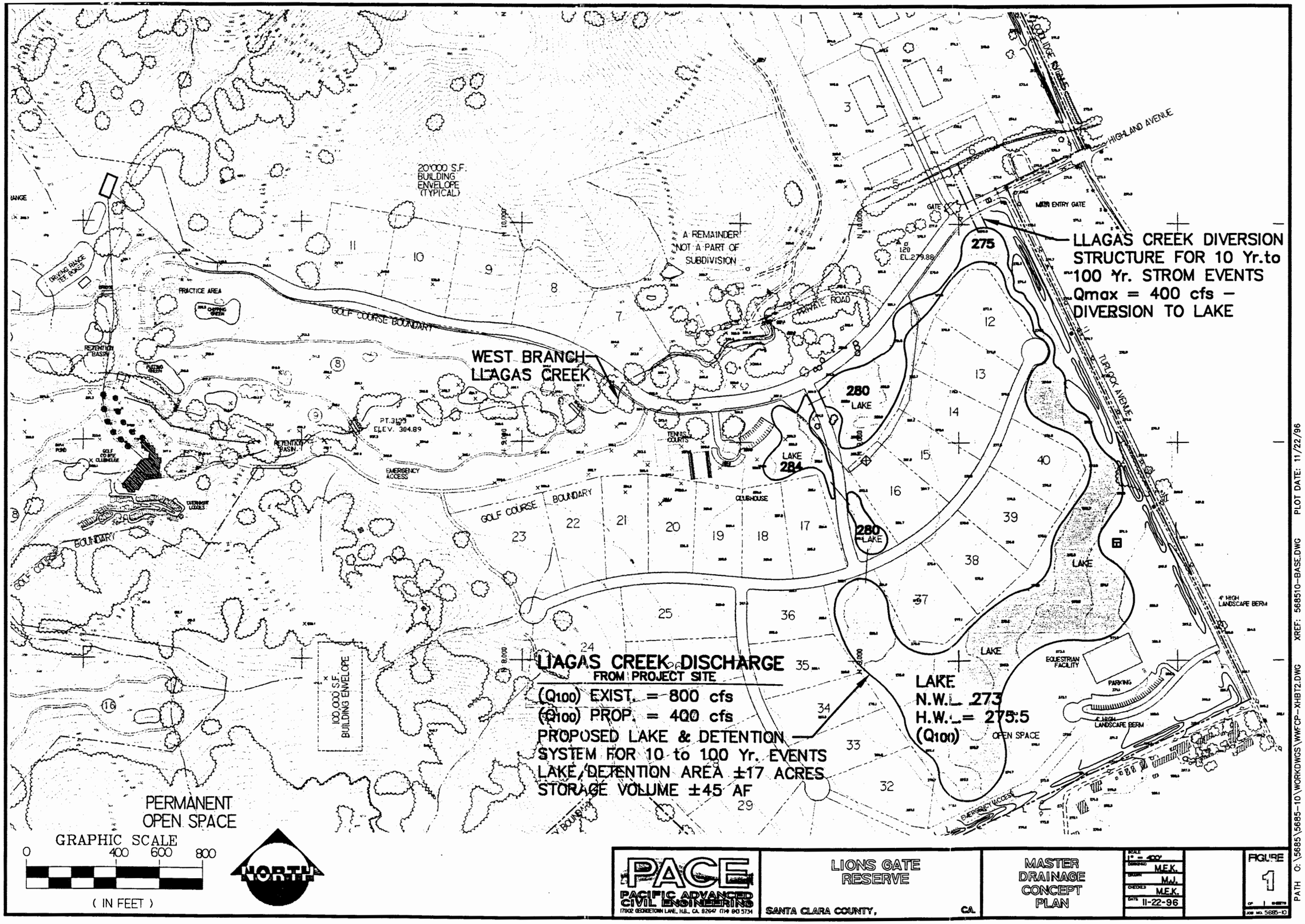
The master drainage plan will be submitted to Santa Clara County and the Santa Clara Water District for review and approval.

The preliminary hydrologic analysis prepared in this report is based upon HEC-1 model obtained from the Santa Clara Country Water District and is included in Appendix.

APPENDIX



DRAINAGE AREA
PROJECT BOUNDARY
S = 284 AC
W1 = 358 AC
W2A = 101 AC
W2B = 125 AC
W3 = 470 AC
ΣW = 1054 AC
W2A
(W1B)
W1
W2B
W3
S
San Martin
Machado School
Lions Peak
Reservoir
Rucker
South County Airport of Santa Clara County



PACE PACIFIC ADVANCED CIVIL ENGINEERING 17802 GEORGETOWN LANE, H.B., CA. 92647 (714) 847-3734	LIONS GATE RESERVE SANTA CLARA COUNTY, CA.	MASTER DRAINAGE CONCEPT PLAN	SCALE 1" = 400' DESIGNED M.E.K. DRAWN M.J. CHECKED M.E.K. DATE 11-22-96	FIGURE 1 OF 1 SHEETS JOB NO. 5685-10

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*   HYDROLOGIC ENGINEERING CENTER       *
*        609 SECOND STREET              *
*      DAVIS, CALIFORNIA 95616          *
*        (916) 756-1104                 *
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:::        Haestad Methods, Inc.         :::
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37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

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  1       ID  WEST BRANCH LLAGAS CR. - 100YR FLOOD  File-WBL.dat
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  3       ID  LOSS RATES OF RURAL PARTS ARE BASED ON MATCHING REGIONAL PEAKS & VOLUMES.
  4       IT     30       0       0     101
  5       IO      5       0

  6       KK    201
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  8       BA   3.62    0.00    0.00
  9       PB   8.00
 10       PI  0.780  0.8300  1.1900  1.2300  1.0200  1.0800  1.7700  1.6200  2.2300  1.8600
 11       PI  1.440  2.2700  1.6800  1.5500  2.0500  1.6600  1.7400  2.1300  1.7700  1.6200
 12       PI  1.600  1.7900  1.8400  1.8700  1.8800  1.9900  2.6600  2.9800  1.9000  2.2900
 13       PI  3.380  3.2300  2.8700  3.4500  6.0000  5.7700  2.2100  2.4600  2.3600  2.0000
 14       PI  1.930  1.7800  2.0700  1.3200  1.8300  1.7200  1.6300  1.6000  0.0000  0.0000
 15       LU  0.133   0.067   5.000
 16       UC  0.890   1.400
 17       BF  -2.00   -0.01  1.3797

 18       KK    202
 19       KM  ROUTE UPPER W.B.L.  TO  FITZGERALD (202)
 20       RL     0.    0.00
 21       RM      1    0.44    0.00

 22       KK    202
 23       KM  MIDDLE W.B.L. @ FITZGERALD (LGN2 @ 202)
 24       BA   1.77    0.00    0.00
 25       PB   7.74
 26       LU  0.129   0.069   7.000
 27       UC  1.240   0.280
 28       BF  -2.00   -0.01  1.3797

 29       KK    202
 30       KM  TOTAL W.B.LLAGAS @ FITZGERALD (LGN1+2 @ 202).
 31       HC      2

 32       KK     20
 33       KM  ROUTE (LGN1+2)TO MOREY CHAN. CONF. @ 20
 34       RL     0.    0.00
 35       RM      1    0.61    0.00

 36       KK     20
 37       KM  LOWER W.B.L. @   MOREY (LGN3 @ 20)
 38       BA   1.48    0.00    0.00
 39       PB   7.52
 40       LU  0.125   0.063  41.000
 41       UC  1.240   0.170
 42       BF  -2.00   -0.01  1.3797

 43       KK     20
 44       KM  TOTAL W.B.LLAGAS CREEK U/S LIONS (LGN1+2+3 @ 20)
 45       HC      2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  46      KK      19
  47      KM  LIONS CR. U/S MOREY (LG01 @ 19)
  48      BA    2.09     0.00     0.00
  49      PB    8.04
  50      LU   0.134    0.067    9.000
  51      UC   0.870    0.640
  52      BF   -2.00    -0.01   1.3797

  53      KK      19
  54      KM  NORTH MOREY U/S MOREY(LG02@ 19)
  55      BA    1.02     0.00     0.00
  56      PB    7.68
  57      LU   0.128    0.064   41.000
  58      UC   1.150    0.180
  59      BF   -2.00    -0.01   1.3797

  60      KK      19
  61      KM  MOREY CHANNEL U/S N MOREY CONFL. (LG03 @ 19)
  62      BA    0.76     0.00     0.00
  63      PB    7.46
  64      LU   0.124    0.062   50.000
  65      UC   0.500    0.160
  66      BF   -2.00    -0.01   1.3797

  67      KK      19
  68      KM  MOREY CHANNE D/S N.MOREY (LG02+3 @ 19)
  69      HC       2

  70      KK      19
  71      KM  LIONS CREEK D/S MOREY CHANNEL. (LG01+2+3)@ 19.
  72      HC       2

  73      KK      20
  74      KM  ROUTE LIONS TO W.B.L. CONFL.
  75      RL      0.     0.00
  76      RM       1     0.17     0.00

  77      KK      20
  78      KM  LG04
  79      BA    0.25     0.00     0.00
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  81      LU   0.123    0.061   52.000
  82      UC   0.470    0.160
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  84      KK      20
  85      KM  LIONS CR. U/S W.B.LLAGAS.(LG01+2+3+4)@ 20
  86      HC       2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  87      KK      20
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  90      KK      21
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  92      RL       0.    0.00
  93      RM       1    0.75    0.00

  94      KK      21
  95      KM  AREA TRIB. TO RONAN CHANNEL (LGQ1 @ 21)
  96      BA    2.14    0.00    0.00
  97      PB    7.01
  98      LU   0.117   0.058  31.000
  99      UC   1.730   0.180
 100      BF   -2.00   -0.01  1.3797

 101      KK      21
 102      KM  W.B.LLAGAS U/S MILLER SLOUGH @  21
 103      HC       2

 104      KK      21
 105      KM  MILLER SLOUGH U/S W.B.LLAGAS(LGP1 @ 21)
 106      BA    1.83    0.00    0.00
 107      PB    7.12
 108      LU   0.119   0.059  62.000
 109      UC   2.020   0.180
 110      BF   -2.00   -0.01  1.3797

 111      KK      21
 112      KM  W.B.LLAGAS D/S MILLER SLOUGH
 113      HC       2

 114      KK      18
 115      KM  ROUTE W.B.LLAGAS TO MAIN LLAGAS CR.
 116      RL       0.    0.00
 117      RM       1    0.31    0.00

 118      KK      18
 119      KM  AREA TRIB. TO W.B.LLAGAS(LGQ2 @ 18)
 120      BA    2.84    0.00    0.00
 121      PB    6.66
 122      LU   0.111   0.056   9.000
 123      UC   2.350   0.200
 124      BF   -2.00   -0.01  1.3797

 125      KK      18
 126      KM  TOTAL W.B.LLAGAS U/S LLAGAS CR. @ 18 (INCLUDES LGQ2).
 127      HC       2
 128      ZZ
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*   HYDROLOGIC ENGINEERING CENTER            *
*        609 SECOND STREET                   *
*      DAVIS, CALIFORNIA 95616               *
*        (916) 756-1104                      *
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RAINFALL DISTRIBUTION IS BASED ON C.O.E. STANDARD STORM.
LOSS RATES OF RURAL PARTS ARE BASED ON MATCHING REGIONAL PEAKS & VOLUMES.

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IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

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ITIME		0000	STARTING TIME
NQ		101	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	3	0	ENDING DATE
NDTIME		0200	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL 0.50 HOURS
TOTAL TIME BASE 50.00 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH 20.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
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ROUTED TO	202	1326.	19.00	1006.	611.	299.	3.62		
HYDROGRAPH AT	202	818.	18.50	498.	291.	140.	1.77		
2 COMBINED AT	202	2108.	18.50	1485.	898.	440.	5.39		
ROUTED TO	20	1931.	19.00	1475.	896.	440.	5.39		
HYDROGRAPH AT	20	692.	18.50	430.	261.	127.	1.48		
2 COMBINED AT	20	2518.	18.50	1884.	1152.	566.	6.87		
HYDROGRAPH AT	19	936.	18.50	611.	363.	176.	2.09		
HYDROGRAPH AT	19	490.	18.00	303.	184.	89.	1.02		
HYDROGRAPH AT	19	416.	18.00	223.	136.	66.	0.76		
2 COMBINED AT	19	906.	18.00	525.	320.	155.	1.78		
2 COMBINED AT	19	1832.	18.00	1135.	683.	331.	3.87		
ROUTED TO	20	1781.	18.50	1133.	683.	331.	3.87		
HYDROGRAPH AT	20	135.	18.00	72.	44.	21.	0.25		
2 COMBINED AT	20	1871.	18.50	1205.	727.	353.	4.12		
2 COMBINED AT	20	4389.	18.50	3061.	1873.	919.	10.99		
ROUTED TO	21	3928.	19.00	3033.	1865.	919.	10.99		
HYDROGRAPH AT	21	896.	18.50	571.	344.	167.	2.14		
2 COMBINED AT	21	4703.	19.00	3578.	2204.	1086.	13.13		
HYDROGRAPH AT	21	760.	18.50	516.	320.	156.	1.83		
2 COMBINED AT	21	5424.	19.00	4081.	2522.	1242.	14.96		
ROUTED TO	18	5360.	19.00	4076.	2519.	1242.	14.96		
HYDROGRAPH AT	18	988.	19.00	693.	410.	198.	2.84		
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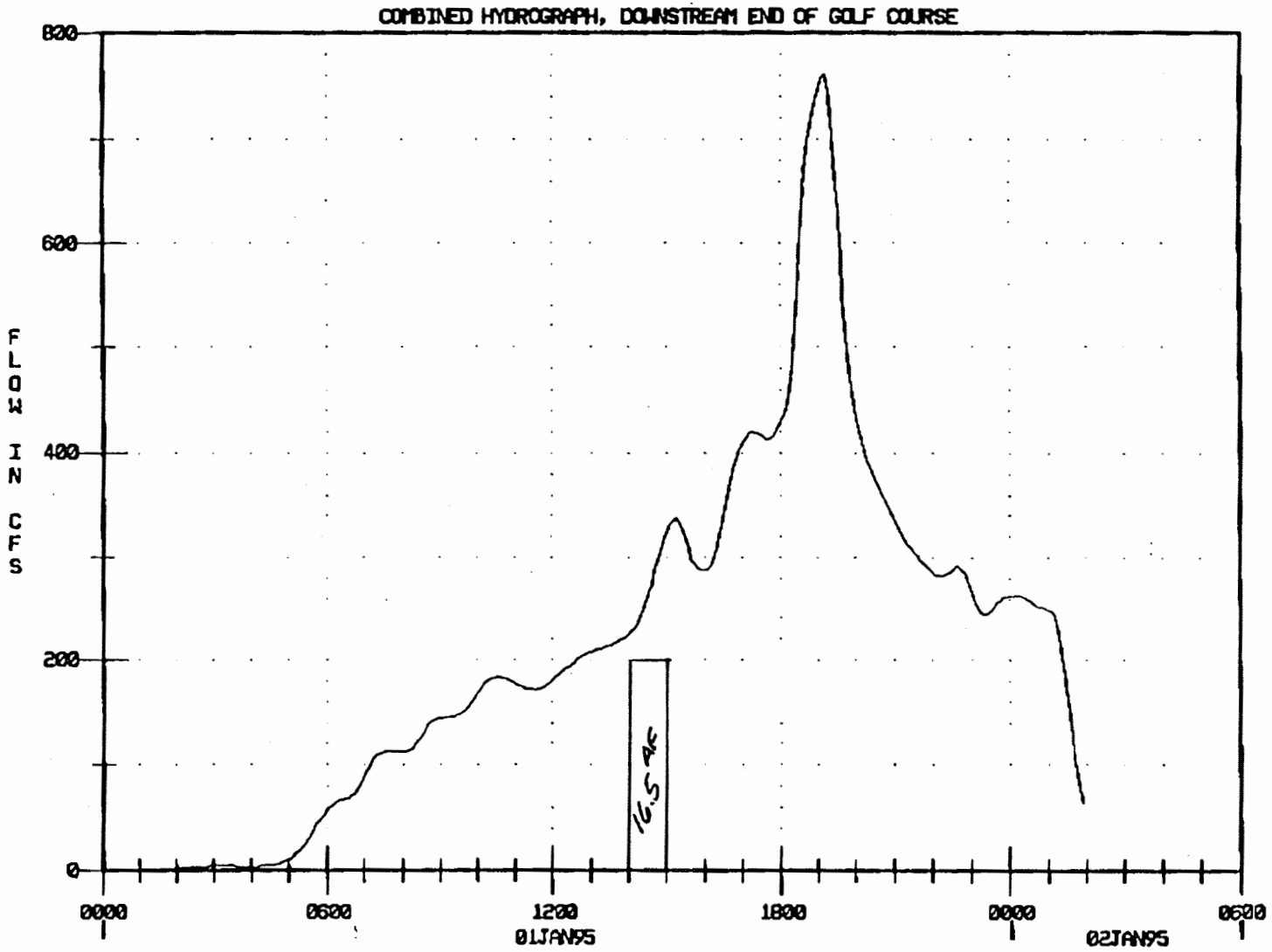

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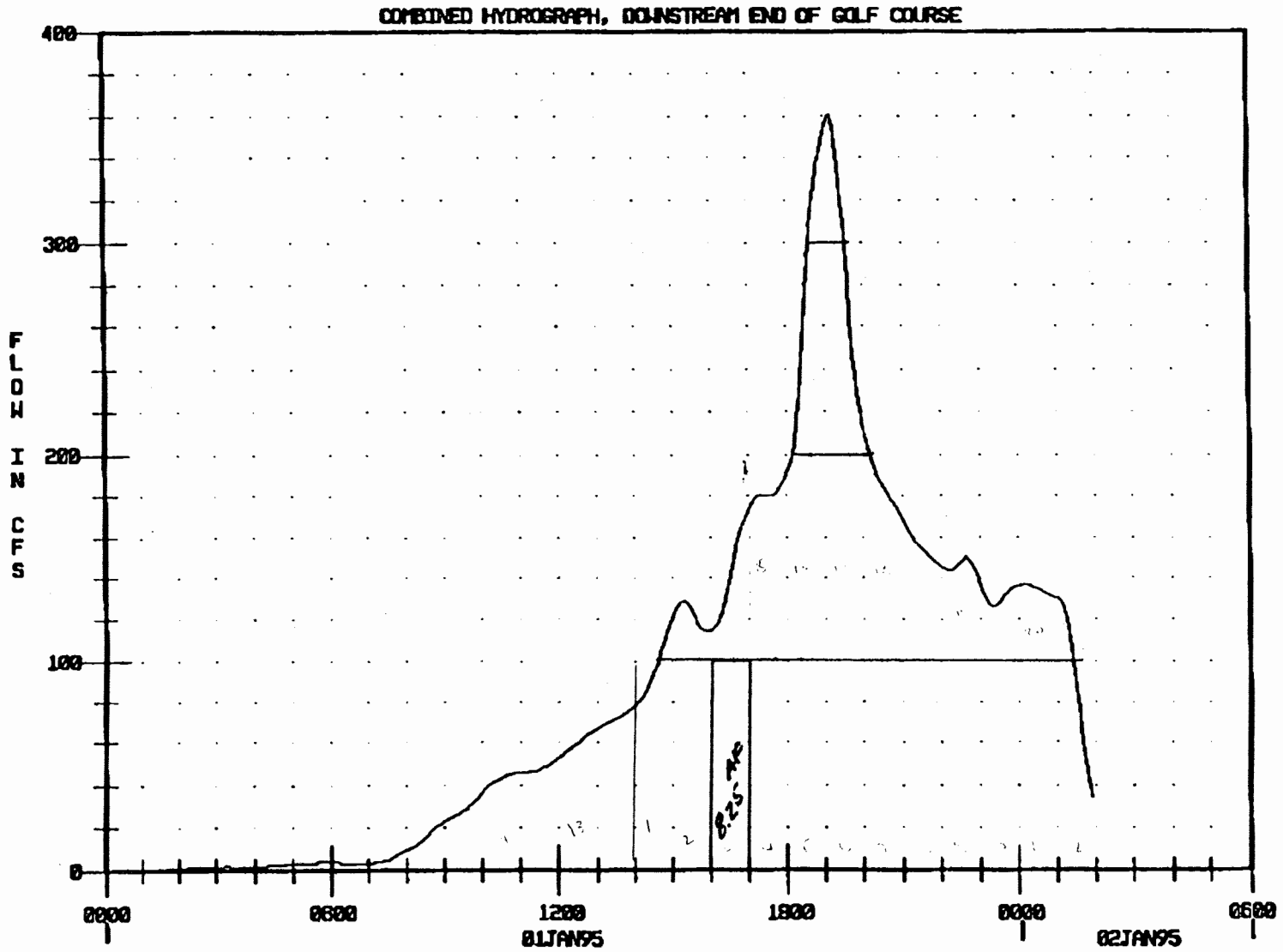


10-YEAR W/PROJECT FLOW (1W3C)

Appendix N

Wastewater System Preliminary Design Report

Prepared By

Pacific Advanced Civil Engineering

December 1996

PRELIMINARY DESIGN REPORT

for the

LION'S GATE RESERVE

WASTEWATER SYSTEM

Prepared By:

Pacific Advanced Civil Engineering
17902 Georgetown Lane
Huntington Beach, CA 92647

December 2, 1996

#6785

PRELIMINARY DESIGN REPORT
for the
LION'S GATE RESERVE PROJECT

WASTEWATER SYSTEM

I. INTRODUCTION

The proposed Lion's Gate Reserve, San Martin, CA consists of 1676 acres in the Hayes Valley, approximately 1 mile west of the rural community of San Martin. The project development concept consists of a golf course and lakes, clubhouse, lodges, 41 estate homesites, and other open space. The proposed method of sewage treatment is by gravity collection to an onsite wastewater treatment/reclamation plant.

II. WASTEWATER COLLECTION, TREATMENT AND DISPOSAL

System Description

The entire project can be sewered by gravity flow of all sewage (not just effluent as previously proposed) to an advanced treatment plant (see attached Figure 1). The sewer collection system will pass through a grit screen and empty into a wet well at the treatment plant. Lift pumps will be used to lift the influent to the SBR tank. The proposed treatment method will utilize the Sequential Batch Reactor (SBR) process, combined with disinfection and final (tertiary) treatment occurring at a constructed wetland area. Discharge of treated effluent will pass from the SBR tank, through a disinfection tank, and flow by gravity out of the disinfection tank through the wetlands polishing cells (please refer to Figure 2). As an alternative to the wetlands polishing system, a rapid sand filtration system will be considered. Finally, treated (oxidized, clarified, disinfected, and polished) effluent will be pumped from the wetlands for use in project landscape buffer irrigation. A storage basin will be provided near the irrigation facilities for storage of reuse water during winter wet weather periods when irrigation reuse is not acceptable.

With the tertiary treatment provided by the system, the effluent will meet Title 22 Reclaimed Water Class II standards (i.e., median 7-day total coliform count less than 2.2/100 ml). This level of treatment **exceeds** the required level of disinfection for its intended use as irrigation water for limited access landscaping (please see Appendix, Table 3.0 - California Code Summary of Title 22 Treatment and Water Quality Requirements). Irrigated areas will be posted with required signage for usage of reclaimed water.

The plant will be owned, operated, and maintained by the Community Services District (CSD).

Plant Site and Building Requirements

The treatment plant site will be located near the southeast corner of the site to take advantage of gravity flow and reduce pumping requirements. Gravity collection to the plant represents substantial savings in both capital costs and ongoing power and maintenance costs over individual pumped septic systems. Regulating agencies, including the Regional Water Quality Control Board, were concerned about the potential for the possible failure of the many individual pumps previously proposed. As shown in the Design Data Section of this report, the effluent water quality produced by the proposed SBR facility substantially exceeds all treatment requirements and specifically reduces nitrate levels well below existing ground water levels (see Appendix for nitrate loading calculations).

The SBR facility, including the disinfection tanks, sludge ponds, and controls, will be housed in a low profile barn-like or residential building. The building will be one story and will only occupy an approximately 40' by 40' footprint. The minimal land coverage, adjacent wetland area, low building profile, and screening provided by a frontage berm along Turlock Avenue all will combine to make the facility inconspicuous.

Treatment Process Description

Basically, the proposed SBR is a one-tank batch treatment process which uses jet aeration and an arrangement of baffles to carry the wastewater through all the processes: biological oxidation, sedimentation, nitrification, and dentrification. These processes occur in a timed sequence during five basic operational modes or periods: (1) fill, (2) react, (3) settle, (4) decant, and (5) idle. Sludge is pumped from the SBR tank to a sludge holding pond, where it is further treated and reduced in volume. Sludge removal from the sludge holding pond will be required infrequently; approximately 3,000 gallons of sludge will be removed every 3 months by tanker truck and taken to an approved municipal treatment facility with sludge processing capabilities. For a detailed description of the SBR Treatment Process, please refer to the information in the Appendix provided by Fluidyne Corp., a leader in the sewage treatment industry.

SBR Conceptual Design Data

Based upon our review of the proposed Lion's Gate Reserve development, and the previously prepared wastewater generation summary table (Table 1.0). We propose a single cell Sequential Batch Reactor (SBR) system with an design flow treatment capacity of 30,000 gallons per day (gpd).

The projected SBR system includes the following elements and design flow rates:

• Bar Screen	50 gpm
• Wetwell Lift Station (2)- 2 hp pumps	50 gpm
• 16' x 48 x 17' SBR Treatment Tank (1) 5 hp jet pump, (2) 5 hp blowers	30,000 gpd
• 16' x 24' x 12' Disinfection Tank	30,000 gal
• Sludge Digester/Emergency Storage Reservoir	40,000 gal
• Effluent Discharge Pump station	275 gpm
• Wet Weather Effluent Storage	6.4 ac-ft

The proposed SBR treatment system will provide an advanced level of treatment to provide high quality of effluent suitable for reuse for all types of irrigation. The preliminary design parameters for the SBR as listed below will exceed the established reuse requirements.

Criteria	Influent Design Data	SBR Treated Effluent Quality	% Removed	Typical Treatment Requirements
Flow Average Day gpd)	25,000	25,000	-	-
Flow Max. Day (gpd)	50,000	50,000	-	-
BOD (mg/l)	300	<5	>95	<30
TSS (mg/l)	250	<5	>95	<30
TN (mg/1)	40	<2	>90	<10

It is evident that the SBR treatment process exceeds typical treatment quality requirements. The high level of nitrate removal is notable and especially important to this site because of the existing groundwater contamination. And, with proper calibration, operation, and maintenance of the SBR system, the above treatment performance can be exceeded.

Disinfection

Effluent discharged from the SBR during the decant cycle will pass through the disinfection tank. The disinfection tank will provide approximately 6 hours of contact time prior to discharge to the wetlands treatment cell. Disinfection will be accomplished by either UV, or ozone methods. Preliminary feasibility analysis suggests that the disinfection method may be a combination of ozone (O2-O3 aeration) and ultraviolet disinfection as required. Disinfection goals are to meet the requirements for total coliform count < 2.2/100 ml. With the use of ozone and/or UV disinfection systems there will be no creation of toxic THM's or other chlorine by/products, thus eliminating any need for dechlorination.

Effluent Polishing - Freewater Surface Wetland Treatment System

The effluent from the SBR disinfection system will flow by gravity through a polishing cell, where bio-filtration and wetlands biological dentrification occurs. The system will consist of a lined area with freewater surface treatment wetlands and irrigation storage. The wetlands treatment cell will be approximately 0.5 to 0.75 acres in size and approximately 2 feet deep. The wetlands will provide a five day treatment retention time (at average effluent discharge rates) prior to discharge into the storage reservoir portion of the wetlands.

The wetlands are for polishing of the effluent only, and are not relied upon to meet the SBR treatment goals. The constructed wetlands will be planted with effective wetland plants to polish, filter, and treat the water through a variety of biological, chemical, and physical processes. Wetlands have proven especially effective for the reduction of nutrient levels (Gerald Moshiri, Ph.D. et al., 1993). The wetland plants will be selected based on indigence, local availability, treatment system functionality, and aesthetics. Thus, the wetlands will have a natural, aesthetically pleasing appearance and will appear to be part of the natural treatment system.

Title 22 Compliance for Effluent Reuse:

The treated effluent from the SBR in the wetlands area will be monitored to meet Title 22 requirements for irrigation reuse (Appendix, Table 3.0 - "California Code Summary of Title 22 Treatment and Water Quality Requirements"). The water will be disinfected to the coliform count of < 2.2/100 ml (Class 2), which exceeds the requirement for limited access landscape irrigation.

The project effluent will be used for irrigation of the project landscape buffer and equestrian grazing area along the east and south-east of the project. The effluent irrigation area requires a maximum area of 8 acres based upon winter irrigation rates.

III. OPERATIONAL ISSUES

Reliability: Extensive reliability measures have been incorporated into the treatment plant design. The wet well will provide a safety margin of storage volume for primary effluent storage.

Emergency storage will be provided by the sludge/containment pond and the lined wetland pond. California Title 22 Code, Division 4 requires that "where short term storage retention or disposal provisions are used as a reliability feature, these shall consist of facilities reserved for... storing or disposing of ...wastewater for at least a 24-hour period." The sludge pond, with 40,000 gallon capacity, will provide 24-hour emergency storage for untreated wastewater and act as a standby primary and sedimentation unit process facility. As an additional reliability measure for an extreme emergency, the treatment facility will have the ability to store untreated wastewater in the lined wetlands area, thus providing a 20-day emergency storage volume.

The treatment plant effluent disposal reliability, in addition to the site irrigation, is further provided by the ability to store effluent for over 120 days during wet weather months in an adjacent storage area. The equivalent 120-day winter effluent volume of approximately 6.4 acre-feet can be held in an approximately 1.75 acre containment area adjacent to the landscape buffer which will utilize the effluent. The normally dry storage area shall be lined with either clay or PVC depending upon soil suitability; the liner will be backfilled with a minimum of 18 inches of soil and landscaped to blend with the surrounding area.

Potential Flooding: Neither the SBR facility/building or the wetlands will be susceptible to flooding during a major storm event, since the entire lined wetland area and the SBR facility will be elevated above the 100-year storm event. The adjacent lake will be constructed with sufficient berming to prevent inundation outside the lake during the 100-year storm event. Current proposed flood control improvements and site grading will significantly reduce this flooding (please refer to Lion's Gate Master Drainage Report). However, in the absence of such improvements, the facilities will all be constructed on pads above the 100-year flood elevation.

Back-up Power Supply: A back-up power supply in the form of a portable or in-place diesel/propane (respectively) generator will be provided in the event of an extended power failure. The back-up generator shall be sized to provide a minimum of 480 VAC, 60 kW.

Solids Disposal: Plant headworks screenings shall be collected from the bar screen and stored in rubbish containers and disposed of properly in a sanitary landfill. The sludge removed from the SBR cell will be processed in the sludge digester basin and thickened. It is estimated that approximately 3,000 gallons of liquid sludge will be removed from the sludge digester every 3 months of operation. The liquid sludge will be transported in tanker trucks to a nearby large scale municipal treatment facility for sludge processing and disposal. Sludge processing is an ongoing process at large scale facilities with belt presses and/or sludge drying beds. The transported sludge is highly aerated and easily introduced into the processing system. In contrast to the sludge hauling, the previously proposed system of septic tanks would require hauling of septage to nearby treatment facilities. Septage is in an anaerobic condition and is not compatible for easy disposal in most activated oxygen type treatment facilities. The facilities have to introduce the septage slowly, so as not to upset the balance in the treatment system bio-mass. Overall, disposal of sludge is preferable to septic tank's solid waste.

Earthquake Safety: The treatment facility will be designed and constructed so that, in the event of a major catastrophe such as an earthquake, spill of untreated sewage would only occur into lined, contained areas (e.g., the wetlands). In addition, the treatment system tanks are mostly below ground level, thus minimizing the risk of a spill.

Operations and Maintenance: The plant will be operated by a certified operator as required by the Regional Water Quality Board. It is assumed that the CSD will contract with an operations individual or company to operate and maintain the facility. Testing and regularly scheduled maintenance should require less than 20 hours per week for a well trained individual with maintenance help as required. The SBR equipment manufacturer will provide a detailed operation and maintenance manual including regularly scheduled maintenance items such as dissolved oxygen sensor calibration, etc.

Testing and Water Quality: The licensed plant operator will provide an approved laboratory with water samples for testing as required by the Title 22 standards.

Environmental Issues:

Nitrates: The groundwater nitrate levels is a significant environmental issue. The SBR treatment combined with wetlands polishing will optimize nitrate removal levels. As previously stated, all previous EIR recommendations for groundwater quality assurance should be followed. As previously required, a provision for a downstream groundwater monitoring well should be included.

Odors: The SBR treatment process utilizes a significant amount of aeration and the treatment process occurs below water level the potential for odors is minimal. Also, the sludge is in an aerated liquid state while on site and when removed from sludge disposal, thereby reducing the potential for odor concerns. The entire treatment facility will be enclosed in a structure to further eliminate the potential for odor dispersion. This method has been used successfully at the Hollister, California wastewater treatment plant (see enclosed photo in Appendix). The Hollister facility is completely enclosed and located in a residential neighborhood and has no mechanical air scrubber system or odor problem.

20'000 S.F. BUILDING ENVELOPE (TYPICAL)

A REMAINDER NOT A PART OF SUBDIVISION

GOLF COURSE BOUNDARY

PRACTICE AREA

DRIVING RANGE TEE BOXES

PUTTING GREEN

RETENTION BASIN

GOLF COURSE CLUBHOUSE

OVERNIGHT LOCKER

PT.3123 ELEV. 304.89

EMERGENCY ACCESS

TENNIS COURTS

CLUBHOUSE

PRIVATE ROAD

MAIN ENTRY GATE

GATE

HIGHLAND AVENUE

TURLOCK AVENUE

LAKE

WETLAND POLISHING AREA

INFLUENT WET WELL AND LIFT STATION

WASTEWATER TREATMENT PLANT (SBR)

LANDSCAPE BERM

WET WEATHER STORAGE AREA (1.5 ACRE)

PARKING

OPEN SPACE

100,000 S.F. BUILDING ENVELOPE

PERMANENT OPEN SPACE

NORTH

GRAPHIC SCALE

0 400 600 800

(IN FEET)

INDICATES REUSE IRRIGATED LANDSCAPE AREA

LEGEND

—→— GRAVITY SEWER

PACE

PACIFIC ADVANCED CIVIL ENGINEERING

17902 GEORGETOWN LANE, HB., CA. 92647 (714) 843 5734

LIONS GATE

GILROY, CALIF.

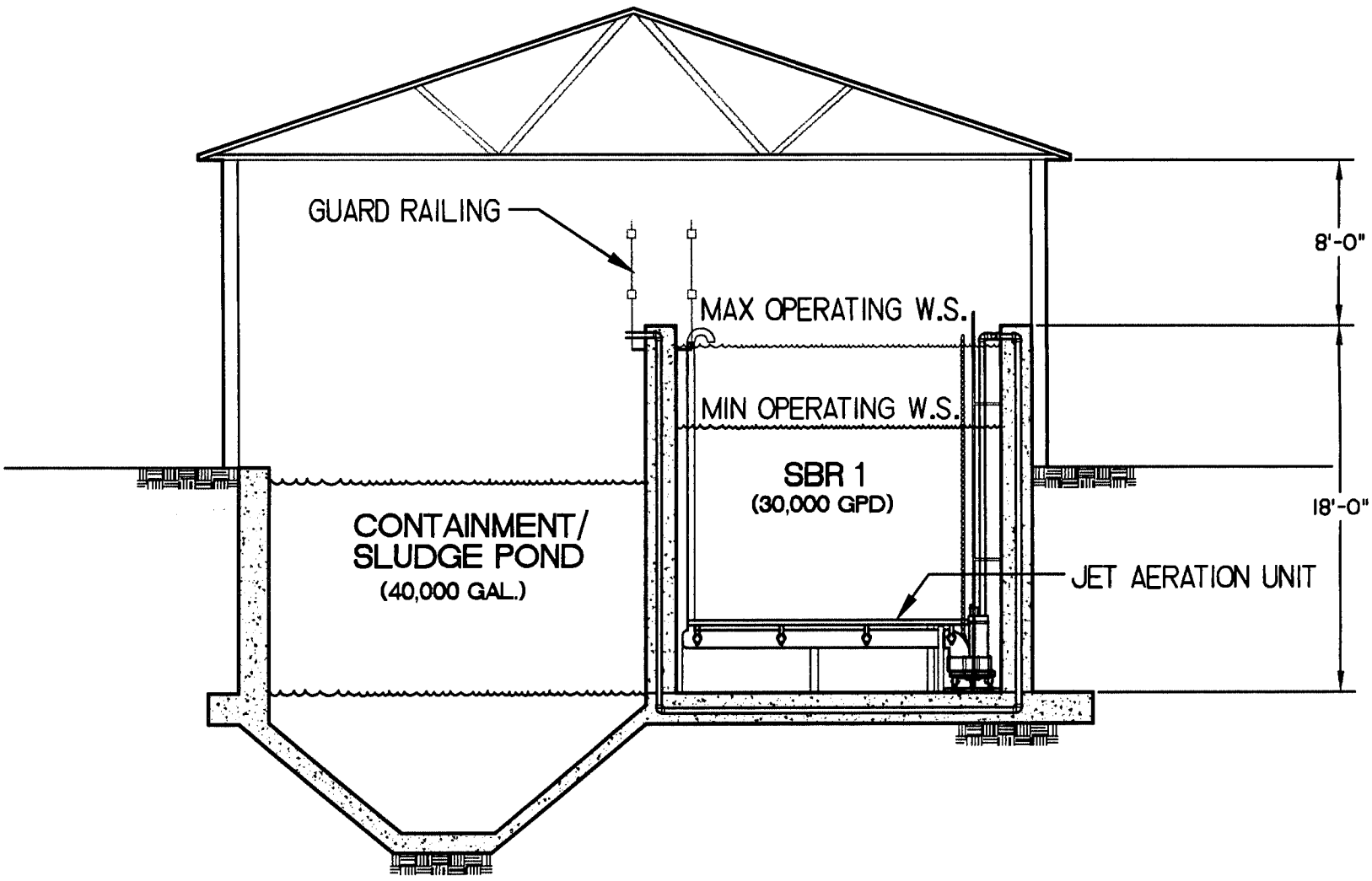
WASTEWATER FACILITIES CONCEPT PLAN

SCALE 1" = 400'
DESIGNED W.P.R.
DRAWN M.J.
CHECKED W.P.R.
DATE 12-09-96

FIGURE 1 OF 1 SHEETS

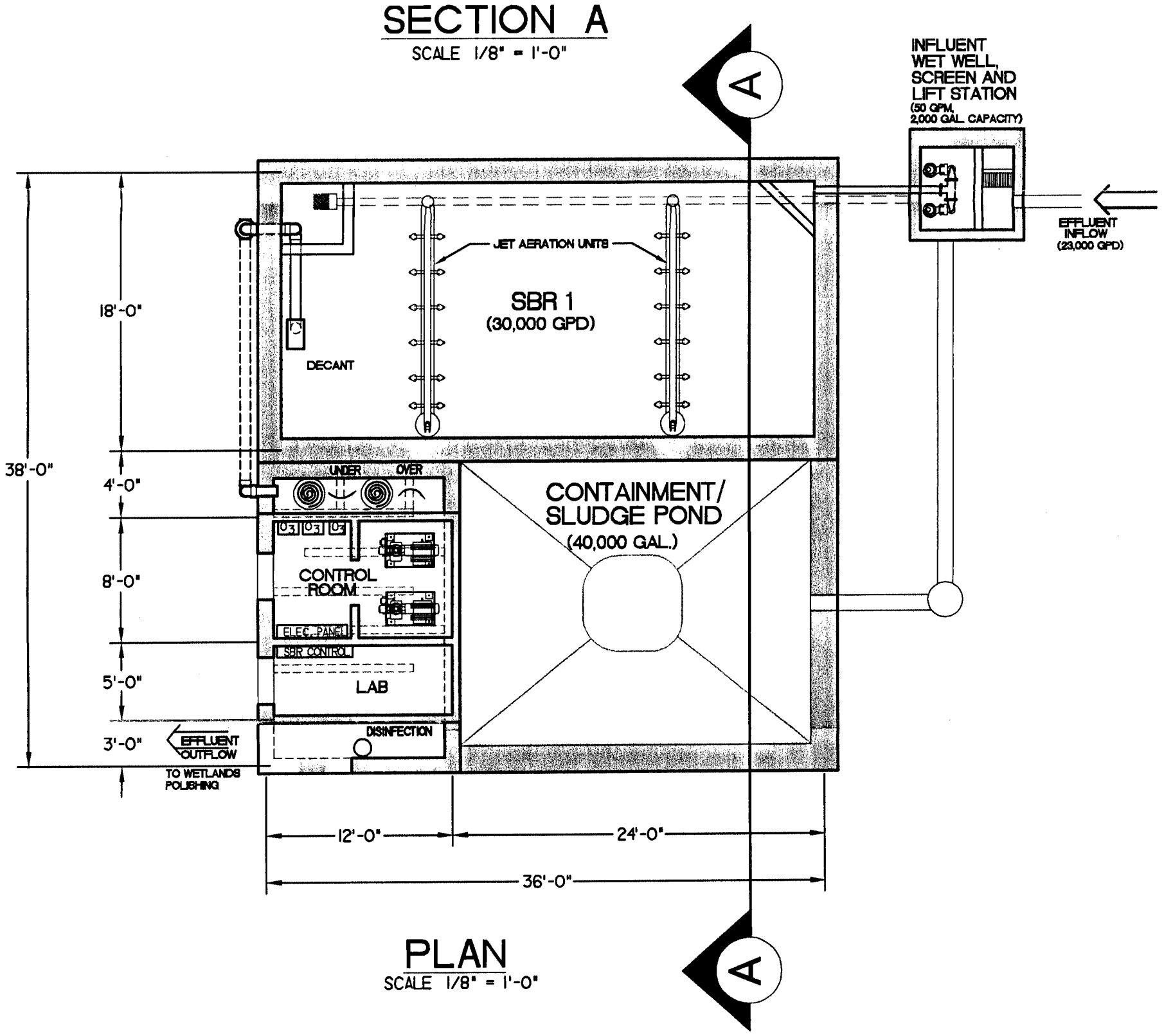
JOB NO. 6785-10

PATH: O:\1996\6785\6785-10\WORKDWGS\WWFCP-XHBT.DWG XREF: 678510-BASE.DWG PLOT DATE: 12/09/96



SECTION A

SCALE 1/8" = 1'-0"



PLAN

SCALE 1/8" = 1'-0"

TITLE: SEQUENCING BATCH REACTOR SCHEMATIC SANTA CLARA COUNTY CALIF.	JOB: LION'S GATE RESERVE	SCALE: 1/8" = 1'-0" DRAWN: M.J. CHKD: W.P.R. DATE: 12-05-96 JOB No. 6785-10	PACE PACIFIC ADVANCED CIVIL ENGINEERING 17902 GEORGETOWN LANE H.B. CA. 92647 (714) 843-5734 FAX 843-4820	2 FIGURE

APPENDIX

- Table 1.0 - Wastewater Generation Data
- Table 2.0 - Advantages of SBR Wastewater Treatment Systems
- Table 3.0 - California Title 22 Code Summary
- Nitrate Loading Calculations
- Fluidyne SBR Treatment System Information

Table 1.0
Wastewater Generation Data

NOTE: TEXT AND TABLE TAKEN FROM LION'S GATE RESERVE EIR APPENDIX M "WASTEWATER FEASIBILITY STUDY FOR LION'S GATE RESERVE SANTA CLARA COUNTY, CALIFORNIA" BY QUESTA ENGINEERING CORPORATION DECEMBER 1995.

The total estimated wastewater flows are summarized in Table 17. Based on the above generation rates, the total wastewater flow for the Lion's Gate project is estimated to be approximately 23,000 gpd. This includes a contingency of approximately 5 percent to account for uncertainties about the specific details of project facilities that would not be determined until the design stage. Final wastewater facility design would also need to anticipate and provide for peak flow conditions which, on a daily basis, may be in order of 25 to 30 percent higher than the average daily flow. For the proposed project this translates to a peak system flow estimate of about 30,000 gpd.**

TABLE 17
ESTIMATED WASTEWATER FLOWS*

Residences	41 houses	250 gpd	10,250
Golf Course Clubhouse • Restaurant	200 meals	10 gal/meal	2,000
• Golfers	200	5 gpd	1,000
• Restroom	20	25 gpd	500
• Showers	30	15 gpd	450
• Employees			
Overnight Units	45 rooms	150 gpd	6,750
Practice Range	50 golfers	3 gpd	150
Equestrian Center	25 visitors	10 gpd	250
Subtotal			22,000
Contingency			1,000
Total Project			23.000
*This does not include the wastewater flows for the golf course maintenance building (approximately 300 gpd) which would be served by an individual septic system.			

**Note: System design hydraulic capacity of 2 x average day.

Table 2.0
Advantages of Fluidyne SBR Wastewater Treatment System

The U.S. Environmental Protection Agency (EPA) has published reports Regarding Sequencing Batch Reactions (SBR's) stating the following treatment system highlights.

1. SBR's provide advanced level treatment and can meet varied and stringent water quality objectives (i.e. peak shaving, nitrate and phosphorous removal, etc.) by simply changing operational strategies or reprogramming the plant software. This is in contrast to conventional plants which would require major expenditures of capital to build larger facilities for advanced treatment.

2. Inherent to the SBR design is it's ability to provide equalization of both flow and quality, and SBR's are generally free from surges, short circuiting and other problems typically seen in conventional plants.

3. SBR plants are reported simpler to operate than conventional plants by a ratio of about 2:1.
   - SBR's require less equipment
   - SBR's require less capital cost
   - SBR's have lower maintenance, labor and material cost.
   - SBR's use less power to operate
   - SBR's total operating cost is lower
   - SBR's are fully automated
   - SBR's seldom require repairs. If necessary, however, repairs can usually be accomplished without any plant down time.

4. In several cases SBR's were constructed instead of continuous flow plants because of the large savings in capitol costs. Savings were important since several plants were 100% privately funded. The cost of a SBR system is about one-half of the cost of a conventional system of similar treatment ability and capacity.

5. Minimal operation complexity along with minimal maintenance time is required for SBR system operation (the 1.0 MGD EPA funded plant in Idaho Springs, Colorado, requires an operator only for about 2 days per week).

6. The total area space required for a SBR is significantly less than for a conventional system.

7. With the SBR design odor is virtually non-existent and plant effluent water quality can be maintained at drinking water standards, including very low nutrient levels which may be the most important factor for discharge and reuse/recharge.

8. The SBR design includes minimal open water areas, thus minimizing effluent evaporation and other losses and maximizes the available effluent for reuse. All water is a resource and the SBR technology conserves it and provides the highest quality treatment available.

9. SBR's produce higher quality effluent without addition of chemicals.
   - SBR's have easier settling floc without the addition of chemicals.
   - SBR's water effluent is so solids-free that it is much easier to filter the effluent if required.

10. SBR's can be programmed to deal with varying degrees of high BOD and suspended solids. SBR's are much less susceptible to system upsets cased by uneven strengths in the influent flow cycles.

11. SBR's are easily expandable to handle additional capacity.

Table 3.0

CALIFORNIA CODE SUMMARY OF TITLE 22 TREATMENT AND WATER QUALITY REQUIREMENTS

Reclamation Alternative	Treatment and Effluent Quality Requirement*	Reclaimed Water Class
Golf course (with contiguous homes), parks, playgrounds and schoolyard irrigation	Tertiary treatment (oxidation, coagulation, clarification, filtration and disinfection); 7-day median # of coliforms ≤ 2.2 per 100 ml, plus maximum of 23/100 ml. in any one sample.	I
Recreation impoundment (non-restricted access)	Tertiary treatment (oxidation, coagulation, clarification, filtration and disinfection); 7-day median # of coliforms ≤ 2.2 per 100 ml, plus maximum of 23/100 ml in no more than 1 sample in a 30 day period.	I
Agricultural food crops for human consumption #	Secondary to tertiary treatment, (extent of treatment varies depending on type of crop and application)	II or I
Recreation impoundment (restricted access)	Secondary treatment (oxidation and disinfection); total effluent coliform <2.2/100 ml, median 7 day.	II
Landscape impoundment	Secondary treatment (oxidation and disinfection); total effluent coliform <23/100 ml, median 7 day.	III
Pasture for milking animals	Secondary treatment (oxidation and disinfection); total effluent coliform <23/100 ml, median 7 day.	III
Golf course, (without contiguous homes), cemetery, freeway, median, and limited access landscape irrigation	Secondary treatment (oxidation and disinfection); total effluent coliform <23/100 ml, median 7 day, plus maximum of 240/100 ml in any 2 samples.	III
Fodder, fiber and seed crops, orchards and vineyards	Primary treatment (screened).	**

* Total effluent coliform requirements refers to a 7 day median value.

** Title 22, in its current form, allows primary effluent for this type of reuse, but in practice, secondary effluent (Class II) is typically required.

\# Reclaimed water not allowed for some crops, such as rice.

Lion's Gate Project
Nitrate Loading Calculations
for
Wastewater Plus Golf Course Fertilizer

Assumptions

- Golf Course Fertilizer Leached (F): 262 lbs to 1,965 lbs (per Audobon Cooperative Sanctuary System)
- Total Annual Recharge Volume (R): 51.9 million gallons (per Audobon Cooperative Sanctuary System)
- Total Nitrogen (N_2) in Secondary Treated Effluent: 2 mg/l
- Wastewater Nitrogen Reduction Through Pond Storage (P): 40%
- Wastewater Nitrogen Reduction Through Plant Uptake and Soil Dentrification (I): 75%
- Average Wastewater Flow = 23,000 gpd = 8.4 million gallons/year.

Calculations

1. Wastewater Nitrogen Leached (W)

   $W = 8.34 ((N_2) (1 - P) (1 - I) (8.4 \text{ million gallons})$
   $W = (8.34) (2 \text{ mg/l}) (1 - 0.4) (I - 0.75) (8.4)$
   $W = 21 \text{ lbs/year}$

2. Total Combined NO_3 - N Concentration in Recharge Water:

   $$N_c = \frac{W + F}{(8.34)(R)}$$

   $$N_c = \frac{27 + 262}{(8.34)(51.9)}$$

   $N_c =$ 0.65 mg/l NO_3 - N Low Estimate

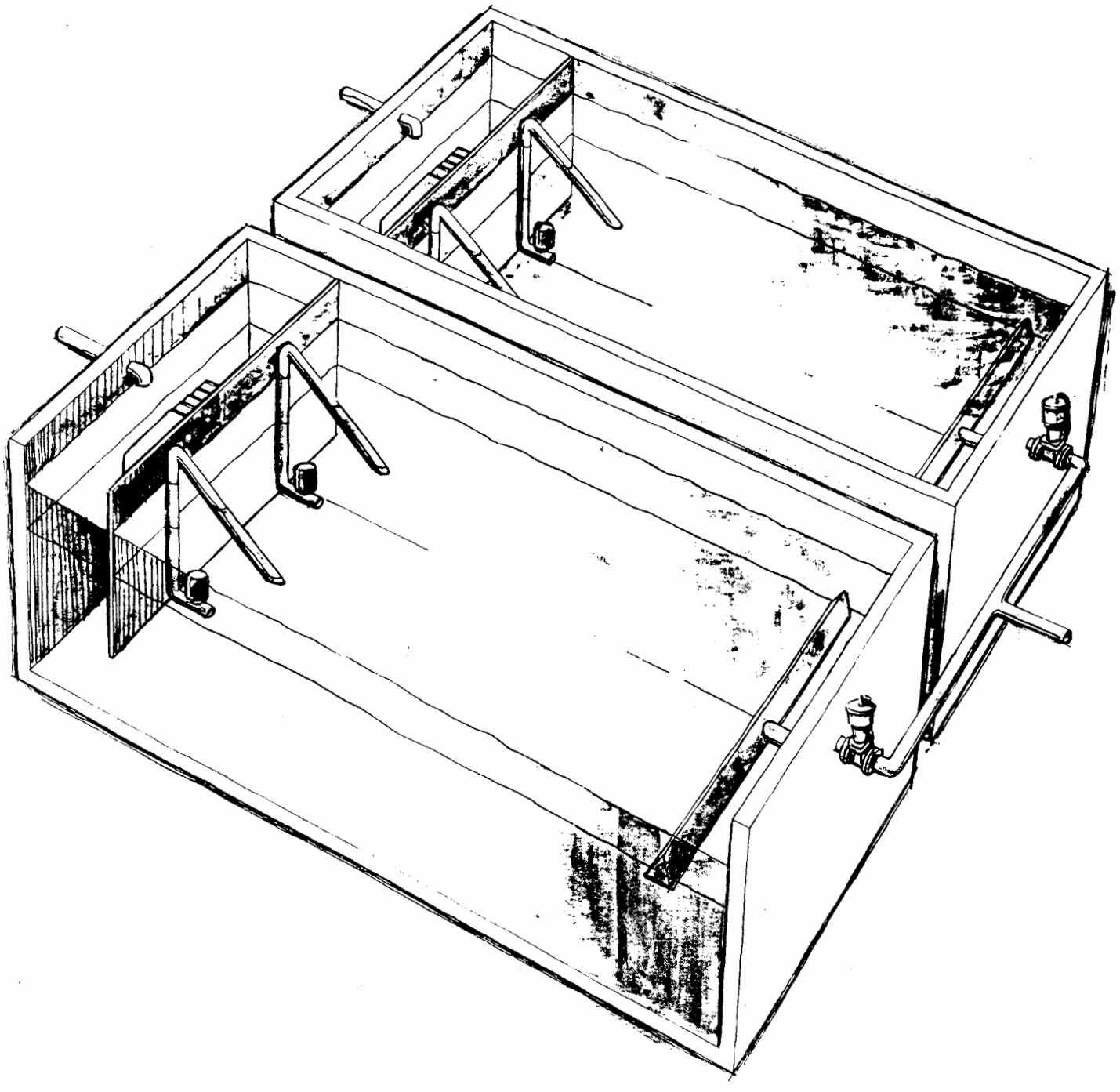
   to

   $$N_c = \frac{21 + 1.965}{(8.34)(51.9)}$$

   $N_c =$ 4.59 mg/l NO_3 - N High Estimate

FLUIDYNE

Sequencing Batch Reactor for economical, reliable, advanced wastewater treatment



FLUIDYNE

A low cost, easily controlled system

Fluidyne's unique Sequencing Batch Reactor (SBR) System answers the need for a reliable yet easily controlled waste water treatment system that fits within limited budgets.

The SBR is particularly suited for systems:

1) with a wide range of inflow and/or organic loadings;
2) requiring minimal operator attention;
3) requiring extremely close control of effluent quality, such as for removal of specific components; and
4) in small to medium size communities and industries such as food processing.

Innovation rooted in proven concepts

Fluidyne's Sequencing Batch Reactor represents an innovation in the field — but the concept of treating wastewater by the batch goes way back. In fact, the original (1914) activated sludge plants **were** batch operations. The switch to the now-conventional continuous flow methodology was largely made to solve mechanical difficulties (diffuser plugging) and reduce the supervision required by the then inadequate batch control systems.

The Fluidyne SBR System gives you the benefits of high quality, low cost batch treatment without the original disadvantages. Aeration is by large-orifice jet mixers (also used in hundreds of conventional plants) which resist clogging as well as create an extremely high rate of oxidation. Supervision is simplified by use of a pre-programmed panel which controls all functions.

No clarifier, sludge recycle pump stations, sludge return pumps or bridgework are involved, so construction costs are minimized. Tank walls can be reinforced concrete or steel. No rotating shafts, gear drives or submerged bearings are used, so maintenance costs are low, too. Energy needs are also very low.

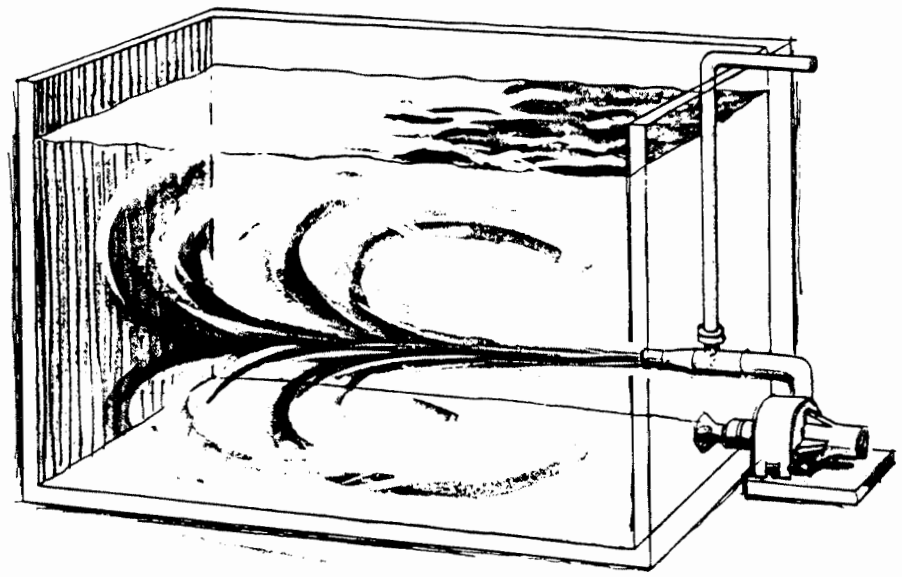
Basically, it's a one-tank system

Conventional continuous-flow treatment systems employ separate staged tanks arranged in a series to process wastewater.

A Fluidyne SBR System does it all in just one tank. You may put several SBR tanks in operation, but that's modular adjustment to capacity needs.

Each SBR tank is equipped with a jet aerator and an arrangement of baffles to carry wastewater through all processes — biological oxidation, sedimentation, nitrification and denitrification. These processes occur in a timed sequence during five basic operating modes or periods: (1) fill, (2) react, (3) settle, (4) draw and (5) idle (anoxic fill).

According to control panel programming, the fill period includes contact with micro-organisms, mixing and — for at least part of the period — aeration. (Aeration may be stopped sometime during the fill to promote settling and/or



In aerating modes, tank contents are pumped through the jet's inner nozzle into a suction chamber, drawing and mixing with air from an air line, and are then ejected from the larger nozzle into the main tank volume. The resulting homogeneous **fine bubble** entrainment produces a high oxygen-liquid transfer while imparting movement to the tank. The air is stopped during mix-only modes.

Fluidyne's Sequencing Batch Reactor System consists essentially of jet mixer and pump assemblies (one on standby), collecting decanter, a control panel and an arrangement of baffles within a tank. Low-pressure blowers are supplied as part of the jet aeration system for larger plants.

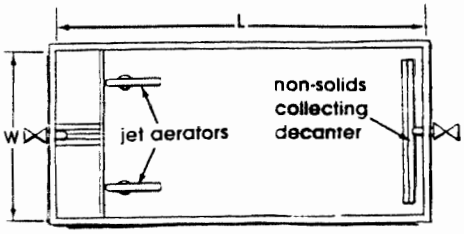
SBR System Advantages *(continued)*

- Fogging, splashing and icing problems associated with surface entrainment aeration are avoided.
- All operating equipment is easily accessible and serviceable. No extended shafts or high maintenance gear drives are used. Retrievable submersible pumps can be serviced locally.
- The system is safer than conventional plants. No personnel work above the tank liquids, no exposed rotating devices are used.
- Jet mixing is highly energy efficient since almost all pumping energy converts to mixing energy. Less horsepower is needed to do the same work than with other systems.

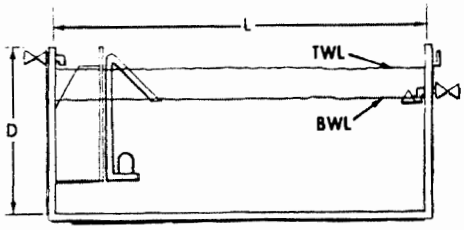
Sizing a standard Fluidyne SBR System

Standard SBR Package Plants and SBR Pre-engineered Plants are available from Fluidyne. The difference between the two types is that Package Plants are furnished with FRP or epoxy-coated steel tankage while Pre-engineered Plants for the larger inflows are supplied less the required concrete tankage. Otherwise both types come complete with all needed mechanical and control components plus any requested design and start-up assistance.

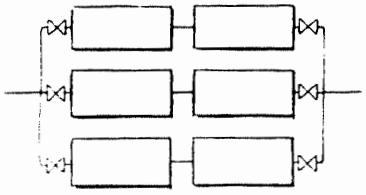
Remember, the plants listed in the charts are modules. You can build larger systems by applying two or more modules.



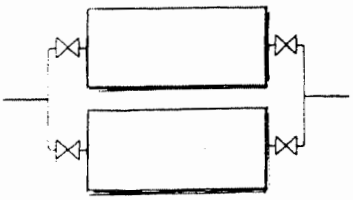
SBR Pre-engineered Plant modules fit in rectangular open concrete tanks, new or existing, provided by others.



SBR Package Plant module featuring horizontal enclosed tank.



Arrange package modules to fit capacity needs — such as three trains of SBR-25's in two stages to build a 150,000 GPD plant.



SBR-1000's in tandem tanks create a 200,000 GPD plant.

STANDARD FLUIDYNE SBR PACKAGE PLANTS
Horizontal enclosed tank, unless otherwise indicated

Model no.	Pop. Equiv.	Flow, GPD @ 100 G/C/D	BOD_5 lbs/D @ 200 mg/l	Tank D x L, ft	Tank vol. usable gal	Pump/aerator HP
SBR-5V*	50	5,000	8.3	11 x 11	7,000	2
SBR-10V*	100	10,000	16.7	11 x 17	11,400	2
SBR-10	100	10,000	16.7	11 x 17	11,400	2
SBR-15	150	15,000	25.0	11 x 27	18,300	3
SBR-20	200	20,000	33.3	11 x 36	24,400	5
SBR-25	250	25,000	41.7	11 x 43	29,100	5
SBR-30	300	30,000	50.0	12 x 43	34,500	7.5

*Vertical open-top tank

Design is based on influent containing 200 mg/l BOD_5 and 40 mg/l TKN, assuming 100% nitrification and 40% denitrification. Peak sustained flow capability is 2.8 x design flow, peak biosorption flow capability is 4.3 x design. If plantsite is over 2000 ft. elevation, use next size larger aeration system.

STANDARD FLUIDYNE SBR PRE-ENGINEERED PLANTS
Operating equipment — concrete tank by owner

Model no.	Pop. Equiv.	Flow, GPD @ 100 G/C/D	BOD_5 lbs/D @ 200 mg/l	Tank I.D. W x L x H, ft	Tank vol. usable gal	Pump/aerator HP
SBR-200	200	20,000	33	10 x 21 x 17	26,300	5
SBR-300	300	30,000	50	12 x 27 x 17	40,500	7.5
SBR-400	400	40,000	67	14 x 30 x 17	52,500	10
SBR-500	500	50,000	83	14 x 36 x 17	63,000	15
SBR-750	750	75,000	125	14 x 52 x 17	91,000	20
SBR-1000	1000	100,000	167	16 x 60 x 17	120,000	30

Design basis is the same as for Fluidyne SBR Package Plants.
Auxiliary aeration system available for BOD_5 and TKN concentrations of more than 200 and 40 mg/l, respectively.
Auxiliary aeration can increase BOD_5 handling capability of any model by up to a factor of five.

FLUIDYNE CORPORATION
Corporate and National Sales Offices
2140 South Ivanhoe St., Denver, CO 80222
(303) 758-4015 Telex 45-636

Manufacturing and Engineering Facilities located in:
Cedar Falls, IA • Davenport, IA (319) 266-9967
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FLUIDYNE

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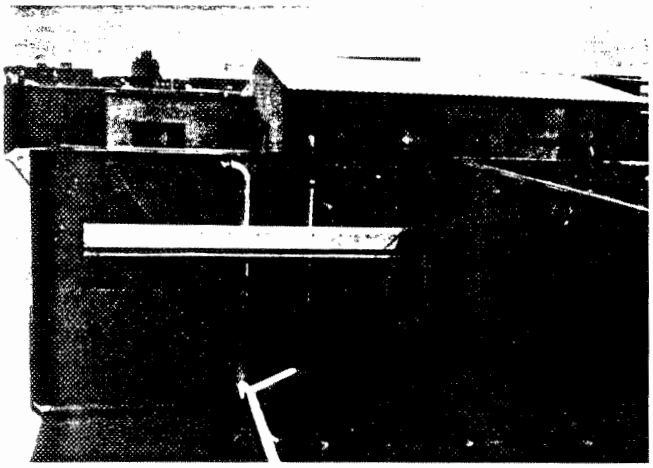
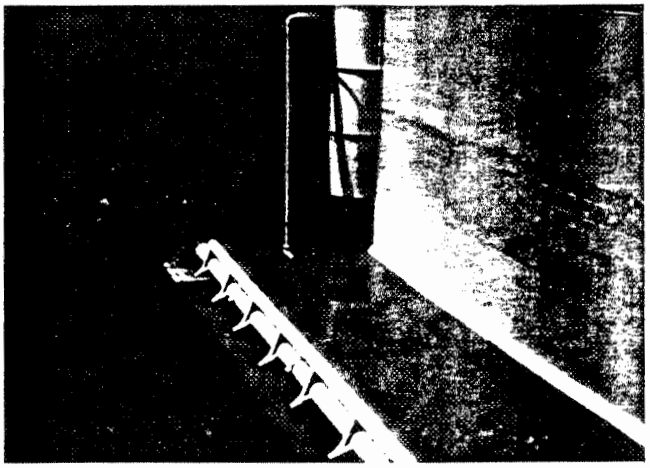
FLUIDYNE FORUM

PRIVATE GOLF COURSE IN MEXICO RECLAIMS WATER FOR IRRIGATION USE

Fluidyne Corporation has provided Campestre Torreon the first Sequencing Batch Reactor in Mexico that turns municipal wastewater into irrigation water.





The Decision:

Mexico's National Water Commission has recently implemented a series of measures intending to preserve the precious water in the area. The agency increased taxes on aquifer removal rights, encouraged utilization of treated wastewater especially for crops and gardens and promoted well water use for only human consumption in areas of most need.

The administrative body at Campestre Torreon determined that it was not possible to continue to irrigate the golf course with well water, realizing that there was a greater need for potable water in other sectors of the city. The engineers decided that they would reclaim wastewater from the city sewer and use that as their irrigation source.

After much deliberation, it was determined that the Fluidyne Sequencing Batch Reactor would be the ideal treatment system. Campestre Torreon based the decision on several key factors: (1) Ability to maintain the ecosystem in their man-made lakes due to high quality effluent, (2) Lower capital costs over other processes, (3) Minimal operator attention and time, and (4) Ability to surpass the necessary levels of BOD, TSS, and greases/oils needed for irrigation.

The Design:

Fluidyn's SBR was designed to treat 3200 m3/day (864,000 gpd) from the city's sewer line. Influent BOD, TSS, and greases/oils levels were based on 250mg/l, 300 mg/l and 100 mg/l respectively. The NWC has set standards for treated effluent used for irrigation. These are 30 mg/l BOD, 50 mg/l TSS and 20 mg/l greases and oils. Disinfection after treatment was required to control algae and bacteria growth in the lake and to eliminate the high levels of fecal coliforms.

The Process:

From the city line the raw sewage is directed to a primary basin where solids can settle before treatment. Then the liquid travels to a dual tank SBR system. As one tank fills, the other tank proceeds through the different cycles of the SBR. The contents of the tank are mixed and aerated using Fluidyne's high efficiency FRP jet headers. When a tank reaches top water level, inflow is diverted to the other tank so that biological reactions can be completed in the full tank. Then the biological solids settle and the clear liquid is decanted through a Fluidyne FRP Solids Excluding Decanter. (See plan view below). From there the decanted liquid travels through a Fluidyne FRP disinfection system where chlorine is added and mixed by a jet nozzle into a reactor tube. All the above functions are regulated by a programmable logic controller. After disinfection, the effluent flows to a storage tank and then it is pumped to a lake on the golf course where the water can be reused.

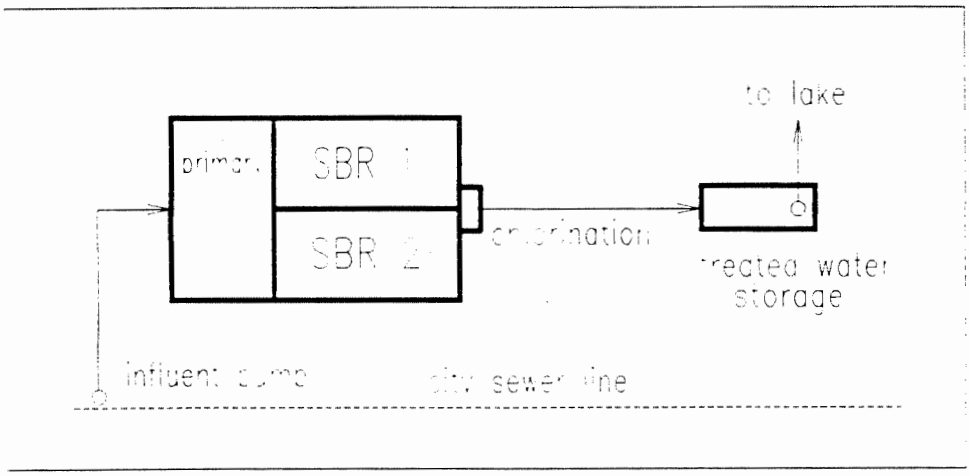
The Campestre Torreon wastewater treatment plant has now been in operation for almost a year and a half. The SBR has easily surpassed all NWC standards. Even the higher than expected grease and oil influent levels are being reduced by over 97%. In February of 1993, the Industrial Metallurgic Laboratory in Mexico tested the effluent quality. The results can be seen in the Table below.

Sample	Influent	Effluent to lake
Greases & Oils	174 mg/l	4 mg/l
TSS	290 mg/l	19 mg/l
BOD	200 mg/l	1.4 mg/l

The Conclusion:

In a country such as Mexico where water is considered so valuable, the Fluidyne SBR now allows a city to take well water that was once used for irrigation and provide it to 2500 additional families. Probably the best way to show the treated wastewater is of high quality is the presence of 3000 to 4000 migratory ducks on the irrigation lake and a thriving fish population in the lake.

The Fluidyne SBR is also beneficial to Campestre Torreon in an economical sense. The golf course now does not have to pay high fees for well water rights. Campestre Torreon expects to recover their investment with the Fluidyne SBR in four years.



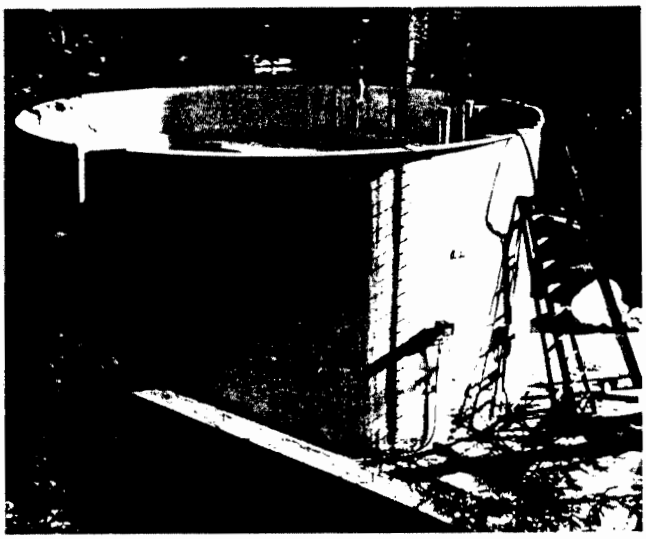
FLUIDYNE SOLVES CAMP PROBLEMS BY SWITCHING TO A SBR

Woodleaf, a Young Life camp for teenagers located in Challenge, California, had a problem with their existing treatment system. Their twenty-year old plant consisted of a septic tank followed by aerobic treatment. From there, the treated effluent was pumped to leach fields via a dosing tank. The problem was that the effluent still contained high levels of BOD, TSS and ammonia which were quickly deteriorating the leach field. Plus, during the peak months of summer terrible odors were annoying the campers.

Young Life wanted to continue on site disposal to safeguard the environment and to insure the camp as the best possible neighbor, above any reproach from downstream water users. Based on this, Fluidyne designed a SBR package that allowed for secondary effluent disposal to the existing leach fields. Woodleaf chose the Fluidyne SBR because of its reputation for high quality effluent, ability to handle variable flow conditions, and capability of removing ammonia and nitrates.

The plant was designed to remove better than 90% of BOD and Total suspended solids and to treat an ultimate flow of 40,000 gpd. However, built into the control mechanisms was a turndown capability to treat lesser flows during periods of low camp population. DO controls were included to provide the greatest oxygen-transfer efficiency.

Photo below: Woodleaf's SBR tank consists of 8 panels constructed by Fluidyne out of fiberglass reinforced polyester and installed by a Fluidyne technician on the job site. The DO controls are mounted on the exterior wall.



MINE ACCIDENT DOESN'T SLOW FLUIDYNE HYDRO-GRIT ™

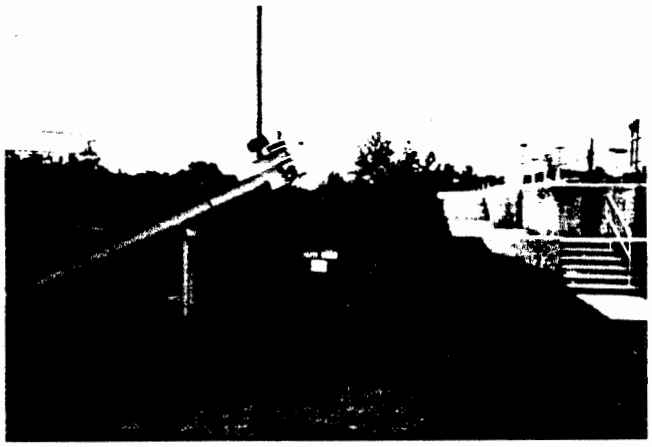
Connellsville, Pennsylvania wanted a system that would successfully remove large amounts of grit from raw sewage before treatment in its 7 MGD plant. So in 1990, the city selected the Fluidyne Hydro-Grit™ based on the systems ability to separate and remove grit particles including fine grit, handle variable feed stream flow rates, and have low energy requirements. The fact that the Hydro-Grit™ was all-hydraulic, non-mechanical, and non-clogging also attracted the city.

Three years later, Fluidyne's Hydro-Grit™ System has worked above and beyond the expectations of the city of Connellsville,

Pennsylvania. Early in 1993, a local contractor was grouting an underground mine and accidentally drilled through the city sewer line. As a result, several tons of fine grained coal refuse grout were carried to the wastewater treatment plant. John Tomaro of Widmer Engineering, the engineer for Connellsville, took a photograph of the Hydro-Grit™ after the coal had been removed from the influent.

In a letter to Fluidyne's sales representative, John Tomaro writes "As witnessed by the photo, the Fluidyne "hydro-grit" chamber performed better than expected in removing this fine grained material from the raw wastewater. As they say "a picture is worth a thousand words" and I would certainly specify this unit on future projects."

Photo below: Fluidyne Hydro-grit classifier after removal of the fine grained coal from Connellsville, PA sewer line.



Information on the Hydro-grit™ is available from Fluidyne or its sales representatives.

TESTS DEMONSTRATE STRENGTH OF FRP

Continued research and testing into the Fluidyne composite materials show the superior strength qualities of Fluidyne fiberglass reinforced polyester. Fluidyne has developed special composites and fabricating techniques which far exceed industry standards. These techniques are used in much of the equipment and tanks Fluidyne supplies to wastewater treatment plants.

Recent linear stress tests conducted by an independent laboratory show the superior strength of Fluidyne products. Two fiberglass samples were tested with one sample withstanding 14,300 psi and the other sample withstanding 14,100 psi. With the majority of Fluidyne's products based on a 1500 psi requirement, the tests demonstrate the durability and sturdiness of Fluidyne products.

Contact Fluidyne for detailed design information and recommendations to meet your requirements in the following areas:

Jet Aeration
Sequencing Batch Reactors
Package Treatment Plants
SBR Pilot Plants
Jet Mixing
Jet Disinfection
Grit Separation and Removal
Fiberglass pipe and tanks

FLUIDYNE

2816 West First Street
Cedar Falls, IA 50613
Phone: (319) 266-9967
Fax: (319) 277-6034

ADDENDUM TO

ENVIRONMENTAL IMPACT REPORT

LION'S GATE RESERVE

LEAD AGENCY: COUNTY OF SANTA CLARA

File #4039-67-28-93
SCH #94043016

January 1997

PREFACE / INTRODUCTION

Overview of Project Modifications

This EIR Addendum has been prepared to address the changes to the Lion's Gate Reserve project that have been proposed since the time that the EIR on the project was certified by the County Board of Supervisors in August 1996. These changes to the project are briefly described below and addressed in detail in the body of this document.

1) Wastewater Treatment: Modification of the proposed wastewater collection and treatment process and treatment plant location such that all of the project-generated wastewater would be conveyed by conventional gravity sewers to a treatment plant located in the southeast portion of the site near Turlock Avenue. (There would be no individual on-site septic tanks as previously proposed.) The wastewater would receive tertiary treatment using the Sequencing Batch Reactor (SBR) process, with final treatment and denitrification provided by an adjacent constructed wetland area. (The principal difference between tertiary treatment and the secondary treatment system previously proposed for the project is that tertiary treatment provides a higher level of filtration for the removal of contaminants, heavy metals and suspended solids, and also provides a higher level of nutrient removal. Under the tertiary treatment process proposed, the treated effluent would contain nitrate concentrations of less than 2 mg/l and a coliform count of less than 2.2/100ml, while secondary treated effluent would contain nitrate levels less than 25 mg/l and a coliform count of less than 23/100ml.) The treated effluent would be stored in a dedicated pond located to the south of the treatment facility, and would be applied as irrigation water on the nearby landscaped areas along the project frontage. The previous proposal involved collection of effluent only (with solids to remain in on-site septic tanks), which would be pumped up-gradient to a conventional treatment plant where it would receive secondary treatment, and then sprayed over the nearby practice range and open space areas.

2) Flood Control: Modification of the proposed on-site flood control facilities such that a substantial portion of stormwater exceeding a flowrate of the 10-year storm would be diverted to the residential lake proposed for the southeast portion of the site, thereby significantly reducing the risk of downstream flooding during major storms including the 100-year event. During the 100-year event, approximately 400 cfs of the 800 cfs that would overspill West Branch Llagas Creek west of Coolidge/Turlock Avenues under existing conditions would be diverted to the lake, thereby reducing downstream flooding by about half. The previous proposal was to provide sufficient on-site attenuation of storm runoff such that the project would not result in any increased potential for downstream flooding relative to existing conditions. Thus, under the previous plan, the lake would have provided detention storage for approximately 65 cfs added by the project during the 100-year event, but would not have provided additional protection for the existing downstream flooding problems.

Format of CEQA Review

This document has been prepared in accordance with the requirements of the California Environmental Quality Act (CEQA) which sets forth specific requirements for the documentation of potential environmental impacts which may result from modifications made to a proposed project after an EIR on the project has been certified. Under these circumstances, Sections 15162 through 15164 of the CEQA Guidelines provide for the preparation

of one of three types of documents depending on the situation. The criteria to be met for each type of document are as follows: 1) a 'Subsequent EIR' shall be prepared if the changes to the project are substantial, and will result in major revisions to the EIR, and involve a substantial increase in the severity of previously identified impacts; 2) a 'Supplement to an EIR' shall be prepared if the changes are substantial and the severity of impacts are increased, but only minor changes or revisions to the EIR are necessary; and 3) an 'Addendum to an EIR' shall be prepared if some minor changes and additions are necessary, but the conditions which would necessitate the preparation of a Supplement to an EIR are not present. In the present case, the proposed modifications may or may not be considered substantial, but the overall effect of the changes would be beneficial environmentally, and in no instance would the severity of the impact be increased, as discussed in the body of this document. In addition, the changes to the EIR required to address the proposed project modifications are minor in nature. Thus two of the required criteria for preparing a Subsequent EIR and one of the required criteria for preparing a Supplement to an EIR would not apply. Therefore, according to CEQA criteria noted above, the type of environmental document that should be prepared in this instance is an 'Addendum to an EIR.'

Organization of This Document

As an Addendum to the EIR, this document identifies revisions to the certified EIR which reflect the changes in analysis resulting from the proposed modifications to the project. In order to facilitate the reader's comprehension without having to refer back to the certified project EIR, this document contains the affected impact sections in their entirety. Thus the impact sections from the project EIR on Hydrology and Drainage, and Wastewater Treatment and Disposal, as well as their corresponding summary sections, have been included in this document. Changes to the text are indicated by ~~strikethrough~~ for deletions and <u>underline</u> for additions.

TABLE OF CONTENTS*

* The contents only include sections of the Draft EIR that have been revised in this Addendum.

SUMMARY

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SUMMARY OF IMPACTS AND MITIGATIONS

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E. HYDROLOGY AND DRAINAGE

1. The project would potentially result in increased downstream flooding during the 100-year and 10-year storms. **(Potential Significant Impact)**	1. The on-site lake proposed for the southern residential cluster subdivision would be designed to provide sufficient detention storage for increased peak runoff resulting from site development. In addition, a diversion structure would be constructed in the creek channel to divert a substantial portion of the flows exceeding the existing 10-year flow rates to the residential lake, which would be sized to accommodate flows from the 100-year event. ~~With this pond~~ With these facilities, the peak flow rates leaving the project site during ~~the 100-year and the 10-year storms~~ significant storm events would be substantially lower than under existing conditions. **(Less-than-Significant Impact with Mitigation)**
2. Portions of the residential cluster subdivisions and the wastewater treatment facility ~~would~~ may be subject to shallow flooding (one-foot average depth) during a 100-year event, and the proposed structures could also partially obstruct this sheet flow through the site. However, the total area of the site subject to shallow flooding would be reduced by flood control improvements included in the project. **(Potential Significant Impact)**	2. Potential impacts to the residential subdivisions and the wastewater treatment facility from shallow flooding would be mitigated by constructing building pads on fills raised above flood elevations. The partial obstruction of shallow overland sheet flows by the proposed development would be mitigated by balancing fills with cuts within the flood-prone areas. **(Less-than-Significant Impact with Mitigation)**

Q. WASTEWATER TREATMENT AND DISPOSAL

1. The proposed project would increase the demand for wastewater treatment and disposal facilities at the site. **(Potential Significant Impact)**	1. Increased wastewater from the project would be treated and disposed with new facilities to be constructed in conjunction with the project. **(Less-than-Significant Impact with Mitigation)**

Q. WASTEWATER TREATMENT AND DISPOSAL (CONT'D)

2. The proposed wastewater disposal facilities may result in degradation of surface water and groundwater quality. **(Potential Significant Impact)**	2. Groundwater wells would monitor water quality up-gradient and down-gradient of the proposed spray irrigation area and the storage ponds, with corrective action taken as necessary. **(Less-than-Significant Impact with Mitigation)**
3. The use of reclaimed wastewater for ~~golf course~~ landscape irrigation, and storage of the treated effluent near the residential area ~~would~~ could expose humans to possible physical contact with the treated wastewater, resulting in a potential public health hazard. **(Potential Significant Impact)**	3. The wastewater would be treated to ~~levels deemed acceptable for disposal on golf courses~~, tertiary levels, and would therefore be acceptable for unrestricted landscape irrigation. ~~and the areas affected would be posted to notify golfers and employees where irrigation by treated wastewater is occurring~~ Signs would be posted within the irrigated landscape areas and at the effluent storage pond to notify residents of the presence of reclaimed water. **(Less-than-Significant Impact with Mitigation)**
4. There is a potential for overflow of the storage reservoir, resulting in a public health hazard. **(Potential Significant Impact)**	4. The wastewater storage reservoir would have sufficient capacity to accommodate high rainfall years. **(Less-than-Significant Impact with Mitigation)**
5. The wastewater treatment and disposal system could generate odors. However, since the SBR process proposed involves no odor-producing anaerobic digestion and would be entirely enclosed, no noticeable odors would be generated. ~~**(Potential Significant Impact)**~~ **(Less-than-Significant Impact)**	5. ~~Odor control would be achieved by mechanisms incorporated into the design of the pump stations and the treatment plant, and by measures to be undertaken at the effluent storage pond. (Less-than-Significant Impact with Mitigation)~~ No mitigation required.
6. The existing pond and proposed open water areas of the project, such as the wastewater storage pond and residential lake, have the potential to be sites for breeding of mosquitoes, which could create a nuisance and a potential public health problem. **(Potential Significant Impact)**	6. Mosquito breeding would be controlled by several methods, as appropriate for each type of water body. These methods would include the circulation of water to prevent stagnant conditions, the introduction of mosquito fish, and the application of larvacides. The specific mosquito mitigation measures would be formulated in consultation with the Department of Environmental Health Vector Control District. **(Less-than-Significant Impact with Mitigation)**

Q. WASTEWATER TREATMENT AND DISPOSAL (CONT'D)

7. The location of the treatment plant near Turlock Avenue could result in potential noise impacts to existing and proposed residences in the vicinity. However, the pumps and aerators at this treatment plant would be largely submerged and entirely enclosed within a building, thus minimizing noise. **(Less-than-Significant Impact)**	7. No mitigation required.
8. The location of the treatment plant in proximity to existing and proposed residences could expose residents to potential release of hazardous materials used in the treatment process. However, this treatment plant would not involve the use of hazardous materials. **(Less-than-Significant Impact)**	8. No mitigation required.

I. PROJECT DESCRIPTION

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B. DESCRIPTION OF THE PROPOSED PROJECT

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Wastewater Treatment and Disposal

The proposed method of wastewater treatment and disposal for the project is the use of a centralized collection and treatment operation, with spray irrigation of the treated effluent ~~onto the proposed practice range~~ over specified landscape areas. All of the wastewater from the residential lots and golf course facilities would ~~have septic tanks for the primary treatment (settlement) of solids, with untreated effluent piped to the proposed treatment facility to be located north of the driving range~~ be collected by gravity flow and conveyed to a treatment facility located in the southeastern portion of the site near Turlock Avenue. The treatment plant would provide tertiary treatment and would utilize the Sequencing Batch Reactor (SBR) process, combined with disinfection and final treatment at a constructed wetland nearby. (The principal difference between tertiary treatment and the secondary treatment system previously proposed for the project is that tertiary treatment provides a higher level of filtration for the removal of contaminants, heavy metals and suspended solids, and also provides a higher level of nutrient removal. Under the tertiary treatment process proposed, the treated effluent would contain nitrate concentrations of less than 2 mg/l and a coliform count of less than 2.2/100ml, while secondary treated effluent would contain nitrate levels less than 25 mg/l and a coliform count of less than 23/100ml.)

An effluent storage pond would be excavated ~~to the northwest of the driving range~~ just south of the treatment facility, to provide wet weather storage of the treated effluent. This pond would appear as part of the residential lakes proposed for this area, but in fact would be a separate impoundment. The treated effluent would be disposed of by spray irrigation over ~~the driving range, the chipping green area, and a 3 to 4 acre area in the adjacent permanent open space area to the west~~ the nearby landscaped areas along the site frontage (~~see Section *III. Q. Wastewater Treatment and Disposal*).~~ The treated effluent would be applied at rates matching the evapotranspiration rate of the landscape plants, and spray irrigation would ~~not occur~~ be greatly reduced during the winter months when rainfall would provide for most of the water needs. Thus there would be no leaching or runoff of effluent into the groundwater or on-site drainages. (For a detailed description of the proposed treatment and disposal facilities see Section *III. Q. Wastewater Treatment and Disposal.*)

The golf course maintenance facility located at the western end of the golf course would not be connected to the centralized wastewater disposal system, but would have its own individual septic tank and leachfield.

II. CONSISTENCY WITH PLANS, POLICIES AND REGULATIONS

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D. SANTA CLARA COUNTY POLICIES AND REGULATIONS

General Plan

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Health and Safety

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Wastewater Disposal

The following General Plan policies on Wastewater Disposal are applicable to the project:

R-HS 42 All new septic systems shall be located only in areas where:

a. there is reasonable assurance that they will function effectively over a long period;
b. they can be designed to have a minimum negative impact on the environment; and
c. they will not contaminate wells, or surface and groundwater supplies.

R-HS 43 Septic systems shall not be allowed where site characteristics impede their operation, including sites with:

a. high groundwater conditions;
b. highly permeable soils where wastewater will percolate in excess of one minute per inch;
c. limited depth to bedrock; or
d. gradients in excess of 20% without appropriate studies.

R-HS 44 Alternative or specially engineered wastewater systems may be allowed for commercial or industrial uses, providing:

a. the County has approved a program which ensures that the system's long term maintenance, operating, monitoring and liability costs are provided for by the owner of the facility;
b. the proposed system has a track record of safe and effective long term operation under conditions similar to those in Santa Clara County;
c. the proposed system includes adequate measures to prevent environmental damage in the event of system failure;
d. is appropriate to the site for which it is proposed;
e. is in compliance with all the other pertinent County policies and regulations; and
f. with Regional Water Quality Control Board wastewater discharge requirements.

R-HS 45 Alternative wastewater treatment and disposal systems may be allowed for individual residential development only if:

a. a traditional septic system adequate to serve the proposed development could be constructed, if needed;
b. it can be shown that the alternative system will function more effectively than a septic tank system and be beneficial to the environment;
c. the density of the proposed residential development is consistent with the density normally allowed within that property's General Plan land use designation;

d. the proposed system has a tack record of safe and effective long term operation under conditions similar to those in Santa Clara County;
e. the proposed system is in compliance with all other pertinent County policies and regulations;
f. the system is appropriate to the site for which it is proposed;
g. the proposed system includes adequate measures to prevent environmental damage in the event of system failure, such as discharge of inadequately treated effluent to the land (e.g., surface, lakes, streams, etc.);
h. the proposed system will operate in full compliance with Regional Water Quality Control Board waste water discharge requirements; and
i. the County has approved a program which ensures that the system's long term maintenance, operating, monitoring and liability costs are provided for by the owner of the facility. Such a program may include, but is not limited to, recorded contractual obligations, permit fees or insurance policies; special permit conditions; and, performance bonds for system replacement.

R-HS 46 Alternative waste water disposal systems intended to serve two or more residences may be allowed only if:
a. they comply with all provisions of the preceding policy; and
b. there exists an appropriate public entity which has agreed to, and is financially able to, assume full responsibility for the system's long term maintenance, operating, monitoring and liability costs.

Analysis: The proposed wastewater treatment facilities conform with the above policies in all respects. If necessary, a traditional septic system could be constructed to serve the residential development. However, given the historically high nitrate levels in the Llagas Groundwater Basin, it would be beneficial to the environment to utilize the proposed alternative system here instead. The proposed Sequencing Batch Reactor (SBR) process would be particularly beneficial here since it would provide tertiary level treatment resulting in final nitrate concentrations of less than 2 mg/l. (See Section *III. Q. Wastewater Treatment and Disposal* for a detailed discussion of the proposed treatment system.)

The wastewater system proposed for the project would require the approval of the County Department of Environmental Health and the Central Coast Regional Water Quality Control Board, which would in effect implement the above policies. Therefore, the project would be consistent with the Wastewater Disposal policies of the General Plan.

III. ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

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E. HYDROLOGY AND DRAINAGE

This discussion is mainly based on the following reports: Hydrology and Drainage - Lion's Gate Development prepared by Schaaf & Wheeler in November 1995; and the Preliminary Design Report for the Lion's Gate Reserve Master Drainage Plan prepared by Pacific Advanced Civil Engineering in November 1996. ~~The full report is included as~~ Both of these reports are contained in Appendix D of this EIR.

Environmental Setting

Area-Wide Drainage

The project site is located in the Llagas Creek watershed which drains from the eastern slopes of the Santa Cruz Mountains and the western slopes of the Mount Hamilton Range south to the Pajaro River and Monterey Bay near Watsonville. The major tributaries of Llagas Creek are Little Llagas Creek, Madrone Channel, Coralitos Creek, San Martin Creek, Church Creek, and West Branch Llagas Creek. Llagas Creek and its tributaries drain a total of approximately 105 square miles upstream of its confluence with the Pajaro River south of Gilroy.

The climate of the south Santa Clara Valley is similar to that of the San Francisco Bay Area. Summers are warm and dry while winters are mild and moderately wet. Nearly 90 percent of the annual rainfall occurs in the late fall or winter months, with January normally being the wettest. The mean annual precipitation varies within the Llagas Creek watershed from a high of over 50 inches in the Santa Cruz Mountains to a low of 14 inches on the valley floor. The basin-wide average is approximately 20 inches per year.

Stream flows in Llagas Creek are regulated by Chesbro Reservoir, which is owned and operated by the Santa Clara Valley Water District. The reservoir has a total storage capacity of approximately 8,100 acre-feet. The reservoir is operated for water supply purposes, but does provide some incidental flood control benefit due to peak flow attenuation.

The upland areas of the Llagas Creek watershed have soils developed on sedimentary rock, basic igneous rocks and serpentine rocks. The main soils are of the Los Gatos, Gaviota, Vallecitos and Haymen associations. They range in depth from shallow to deep, and are located on steep to very steep slopes. The vegetative cover includes grasses, oak, pine, brush and hardwoods. The infiltration rates of water in the upland areas is generally slow. The upland soils are classified as having a high to very high erosion potential.

The upland portions of the Llagas Creek watershed have very little development at this time, and the County General Plan calls for only limited development in the future with mostly open space. On the valley floor, most of the Llagas Creek channel and its tributaries are leveed or perched channels with channel banks higher than adjacent areas on one side or both sides of the stream channel. Therefore, overflows from the channel tend to flow away from and parallel to the channel.

Based on information from the Federal Emergency Management Agency (FEMA) Flood Insurance Study for Santa Clara County, there are extensive areas of floodplain from Llagas Creek and its tributaries. The most serious of these are within the City of Morgan Hill from West Little Llagas Creek, and in the City of Gilroy from West Branch Llagas Creek.

The Santa Clara Valley Water District and the Soil Conservation Service have completed a flood control project for the Llagas Creek watershed. The downstream reach from Bloomfield Road to the Ronan Channel has been improved to 100-year design standards, and the reach from the Ronan Channel to Route 101 has been improved to 10-year design standards. In addition, 100-year design channels have been provided in the urban areas of Morgan Hill and Gilroy. Improvements in Gilroy included diversion of West Branch Llagas Creek to the Ronan Channel, and channel improvements upstream to Day Road. The project was designed to eliminate most flooding in Gilroy south of Day Road. This project has been completed, and FEMA is in the process of changing the Flood Insurance Rate Maps for this area.

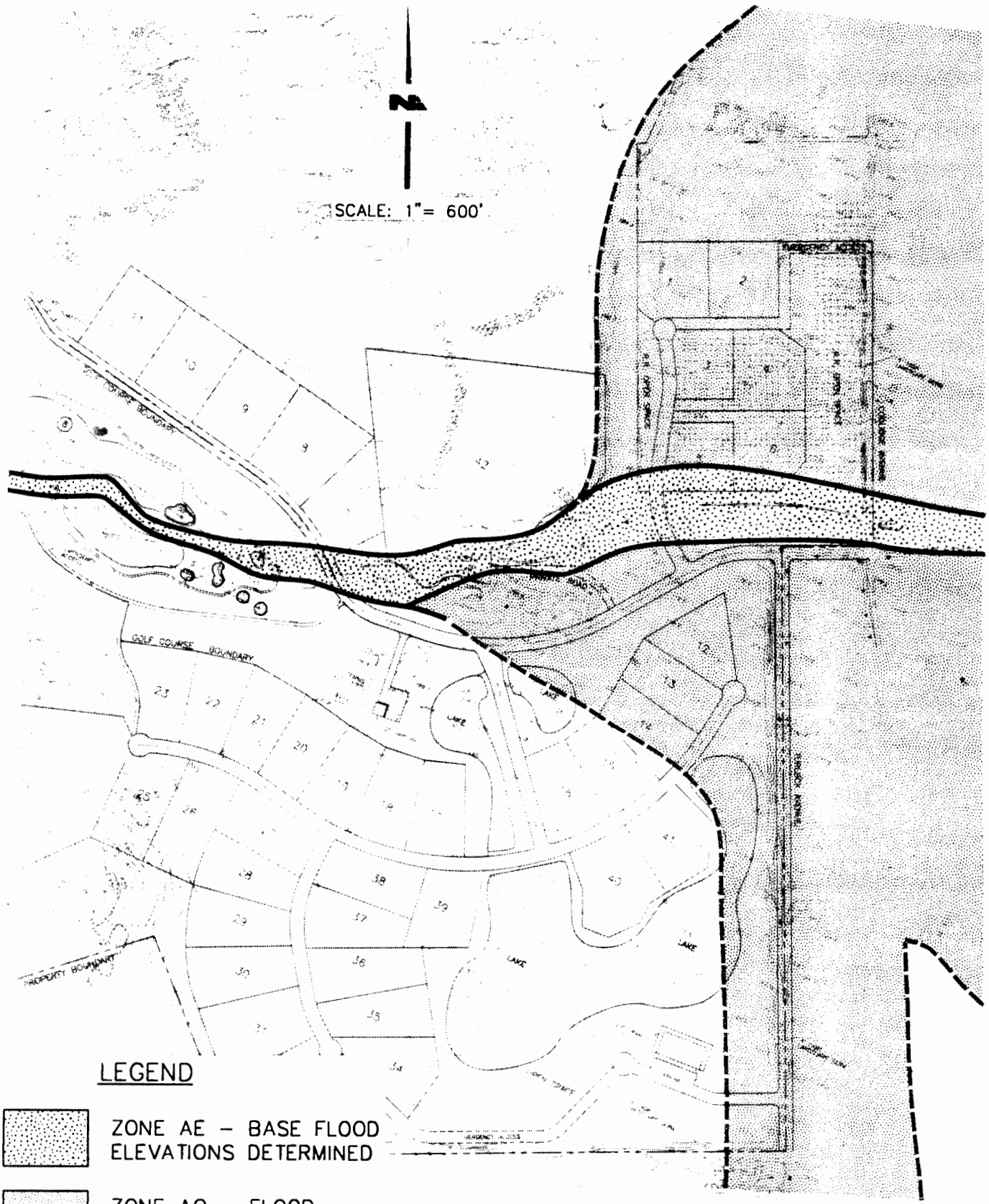
Site Drainage and Flooding Conditions

The project site drains to two separate drainages. The western portion of the site drains to the west to Hayes Creek near Watsonville Road while the majority of the site drains via the east to the West Branch Llagas Creek. A network of intermittent and ephemeral streams flow from the higher elevations on the perimeter of the central valley into the West Branch of Llagas Creek. The Creek has 8 primary tributaries, 4 of which drain the hills north of the valley and with the other 4 originating on the southern ridgeline. These tributary streams flow during winter and spring months for varying periods and are dry the remainder of the year. West Branch Llagas Creek discharges to the Ronan Channel which joins Llagas Creek near Highway 152 east of Gilroy. Hayes Creek drains to Llagas Creek near Watsonville Road, south of Morgan Hill. The are no detailed floodplain studies for Hayes Creek. The area is designated as Zone D on the Flood Insurance Rate Map. Zone D is defined as an area of undetermined flood hazard.

The existing Flood Insurance Rate Maps for West Branch Llagas Creek do not include detailed floodplain studies upstream of Golden Gate Avenue, approximately 2 miles south of Highland Avenue. The stream channel on the project site is designated as Zone A, approximate 100-year floodplain. At Turlock Avenue, the floodplain is shown as approximately 300 feet wide along the channel north of Highland Avenue.

West Branch Llagas Creek has been restudied by FEMA to update the existing Flood Insurance Rate Maps. The draft work maps are currently in the review process and are not expected to be become effective until late 1996. The SCVWD is using the revised maps as the best available information in the interim. The proposed 100-year floodplain for West Branch Llagas Creek near Highland Avenue is significantly larger on the revised maps than on the current maps. The proposed floodplain includes shallow flooding from the channel commencing at the ranch complex on the project site and including the area south of Highland Avenue, west of Turlock Avenue, and the area north of Highland Avenue west of Coolidge Avenue (see Figure 13).

The hydrology for the detailed floodplain study shows an estimated 100-year peak flow rate of 850 cubic feet per second for West Branch Llagas upstream of ~~the on site overflows upstream of~~ Turlock Avenue. An estimated 400 cfs overflows Highland Avenue toward the south upstream of Turlock Avenue. An additional 355 cfs overflows from the channel toward the north upstream of Coolidge Avenue. The northern overflow crosses Coolidge Avenue north site and flows overland to the east and south to the West Branch Llagas Creek channel at Highland Avenue. The majority of the overflow to the south flows overland to the south and east and crosses Turlock Avenue to rejoin the West Branch Llagas Creek floodplain between Highland Avenue and Golden Gate Avenue. A portion of the overflow continues south along the west side of Turlock Avenue.



100-YEAR FLOODPLAIN

FIGURE 13

Ordinances and Regulations that Address Drainage and Flooding

County Drainage Manual: This manual contains guidelines for design and installation of drainage facilities for projects. Projects must demonstrate that drainage will be handled adequately in order to avoid drainage and flooding problems. These guidelines ensure that there are no on- or off-site drainage problems associated with a project.

Grading Ordinance: The ordinance requires that all drainage structures and devices be consistent with the adopted County Drainage Manual and its standards. It outlines disposal requirements for both on- and off-site drainage; provides for slope protection and erosion control; and the design of dikes, swales and ditches.

Land Development Regulations: The County Land Development Engineer reviews all projects to ensure no on- or off-site drainage impacts would occur as a result of the proposed project.

Zoning Ordinance: For projects requiring a use permit, Section 47-5(d) of the Zoning Ordinance ensures that adequate storm drainage exists or shall be provided as a part of the project; and that no on- or off-site drainage impacts would result from the project.

Special Flood Hazard Area Ordinance: This ordinance applies to all areas of special flood hazard (i.e., within the 100-year flood zone as established by FEMA) within the unincorporated area of Santa Clara County. No new development shall occur, or structure or improvement shall be constructed in a flood zone without compliance with this ordinance.

Significance Criteria

With respect for flooding and drainage impacts, Appendix G of the CEQA Guidelines states that a project will normally have a significant effect on the environmental if it will: "(g) Cause substantial flooding, erosion or siltation."

Impact and Mitigation

Impact 1. **The project would potentially result in increased downstream flooding during the 100-year and 10-year storms. (Potential Significant Impact)**

The proposed residential development on the project site would increase the amount of impervious area on the site and therefore increase the runoff from the site.

The cluster residential development area south of Highland Avenue would be served by storm drains which would discharge to the 20-acre lake proposed for the main subdivision area. The overflows from the lake would discharge via storm drains to West Branch Llagas Creek upstream of Coolidge Avenue. In addition, there are approximately 73 acres of hillside area upstream of this residential development area. Drainage from this area would also be collected by the storm drain system and discharge to the lake. The total area of this drainage area is approximately 240 acres.

The golf course would also be located entirely within the West Branch Llagas Creek watershed which drains to the east. There would be no development in the western portion

of the site which drains to the west to Hayes Creek. The West Branch Llagas Creek watershed upstream of Turlock Avenue is approximately 1,060 acres or 1.66 square miles. The golf course development would include approximately 240 acres, the majority of which would be landscaping and turf. The upstream hillside areas would not be affected. The existing creek channel and pond would be largely maintained in their existing configurations. A new pond would be constructed west of the existing pond to serve as an irrigation water reservoir and to detain runoff from the undeveloped area upstream. The new pond would include approximately 9 acre-feet of detention storage.

To analyze potential drainage and flooding impacts, the project site was divided into the following 3 drainage areas: the cluster residential subdivision south of Highland Avenue; the area upstream of the existing pond; the area upstream of the proposed new irrigation reservoir; and the area downstream of the pond golf course reservoir. Discharge rates were estimated for the 10-year and 100-year storms for existing and project conditions.

The results of the flooding analysis show that the proposed golf course would reduce the flow from the site to West Branch Llagas Creek. The golf course would decrease the estimated peak runoff from the watershed because the proposed irrigated turf would maintain a dense layer of thatch which would act as a sponge and reduce runoff, whereas the existing unirrigated range grasses tend to be sparse, with exposed dirt between grass clumps, which does not retain as much runoff. The estimated 100-year peak flow from the golf course area would decrease from 780 cubic feet per second to 765 cubic feet per second, a decrease of 2 percent. The 10-year peak flow rate would decrease from 375 cubic feet per second to 360 cubic feet per second, a decrease of 4 percent.

The proposed golf course irrigation reservoir would also act as a detention facility to reduce the estimated peak flow rate from the western portion of the watershed. For purposes of analysis, the existing pond was assumed to be full at the start of the storm and to have minimal effect on the flood hydrograph. The proposed irrigation reservoir was assumed to be full to spillway elevation at the start of the storm, and to have a 12-foot wide spillway. The estimated storage capacity of the pond is 9-acre-feet with 3 feet of flow over the spillway. The detention storage in the irrigation reservoir would reduce the estimated 100-year peak flow at the pond from 59 cubic feet per second to 39 cubic feet per second, a reduction of 20 cubic feet per second. However when routed downstream and combined with the larger watershed downstream, the detention storage reduces the peak by approximately 10 cubic feet per second. This is due to the difference in timing between the peak flow in the upper watershed and the lower portion of the watershed. The peak flow from the upper watershed is delayed by the travel time along the creek channel and arrives after the peak from the lower watershed. Therefore the peaks do not add directly. The detention storage in the upper watershed acts to increase the timing difference of the upper watershed.

The proposed golf course grading would also include local detention areas to contain runoff from the turf areas for water quality purposes. These would also act to reduce runoff from the site, particularly for small storms. The effect of these detention areas on larger storms would depend on the design and placement of each area and whether the upstream hillside areas would drain to the detention areas or directly to the creek. Therefore, the effects of potential detention storage on the golf course other than the larger pond were not considered in the hydrograph analysis.

The flooding analysis indicated that the proposed cluster residential development would result in a potential increase in the peak runoff from the development site. The 100-year peak flow from the entire watershed would increase from 236 cubic feet per second to 301 cubic feet per second, an increase of 28 percent. The 10-year peak flow rate would increase from 120 cubic feet per second to 160 cubic feet per second, an increase of 33 percent. The increase in peak runoff is due to both the increased impervious area in the development, and the more efficient drainage system which collects runoff faster than the existing overland flow conditions.

However, the cluster residential subdivision would include a proposed lake, and runoff would be drained to the lake, then released to West Branch Llagas Creek. Only the proposed equestrian center in the southeastern corner of the site would be below the lake elevation and would drain toward Turlock Avenue. There is no storm drain system along Turlock Avenue, but runoff flows along the road under existing conditions.

The residential cluster subdivision is located in a drainage area of 240 acres, which would drain to the proposed lake. Without the lake, increased peak runoff from the cluster residential subdivision would potentially increase the peak flow in West Branch Llagas Creek downstream of the project.

Mitigation 1. **The on-site lake proposed for the southern residential cluster subdivision would be designed to provide sufficient detention storage for increased peak runoff resulting from site development. In addition, a diversion structure would be constructed in the creek channel to divert a substantial portion of storm flows exceeding existing 10-year flow rates to the residential lake, which would be sized to accommodate about one-half of the flows from the 100-year event. ~~With this pond~~ With these facilities, the peak flow rates leaving the project site during ~~the 100-year and 10-year storms~~ significant storm events would be substantially lower than under existing conditions.**

The potential increased runoff from the residential area during the 100-year event would be 65 cubic feet per second, without the proposed lake. The proposed lake would have a normal water surface elevation less than the top of bank elevation of West Branch Llagas Creek at the outfall from the pond. ~~The outfall would have a flap gate to prevent high water levels in the creek from discharging back into the pond~~. The diversion structure in the creek would be designed such that a substantial portion of the flows in the creek less than the existing 10-year peak flow would pass under the structure and would not be able to enter the side channel to the lake. Flows exceeding the 10-year peak flow would be blocked by the structure and diverted to the lake for temporary storage (see Figure 13a). This would reduce the 100-year flow rate leaving the site from approximately 800 cfs under existing conditions to approximately 400 cfs. This substantial reduction in flood flows leaving the site would significantly reduce flooding problems along the West Branch of Llagas Creek downstream of the site. However, there still would be overland and downstream flooding during the 100-year event, but the extent and volume of flooding would be reduced as a result of the proposed diversion and storage. Once the storage capacity of the lake is reached, any additional flows would be prevented from entering the lake. Instead, these extreme flood flows would be allowed to overspill the creek, as would

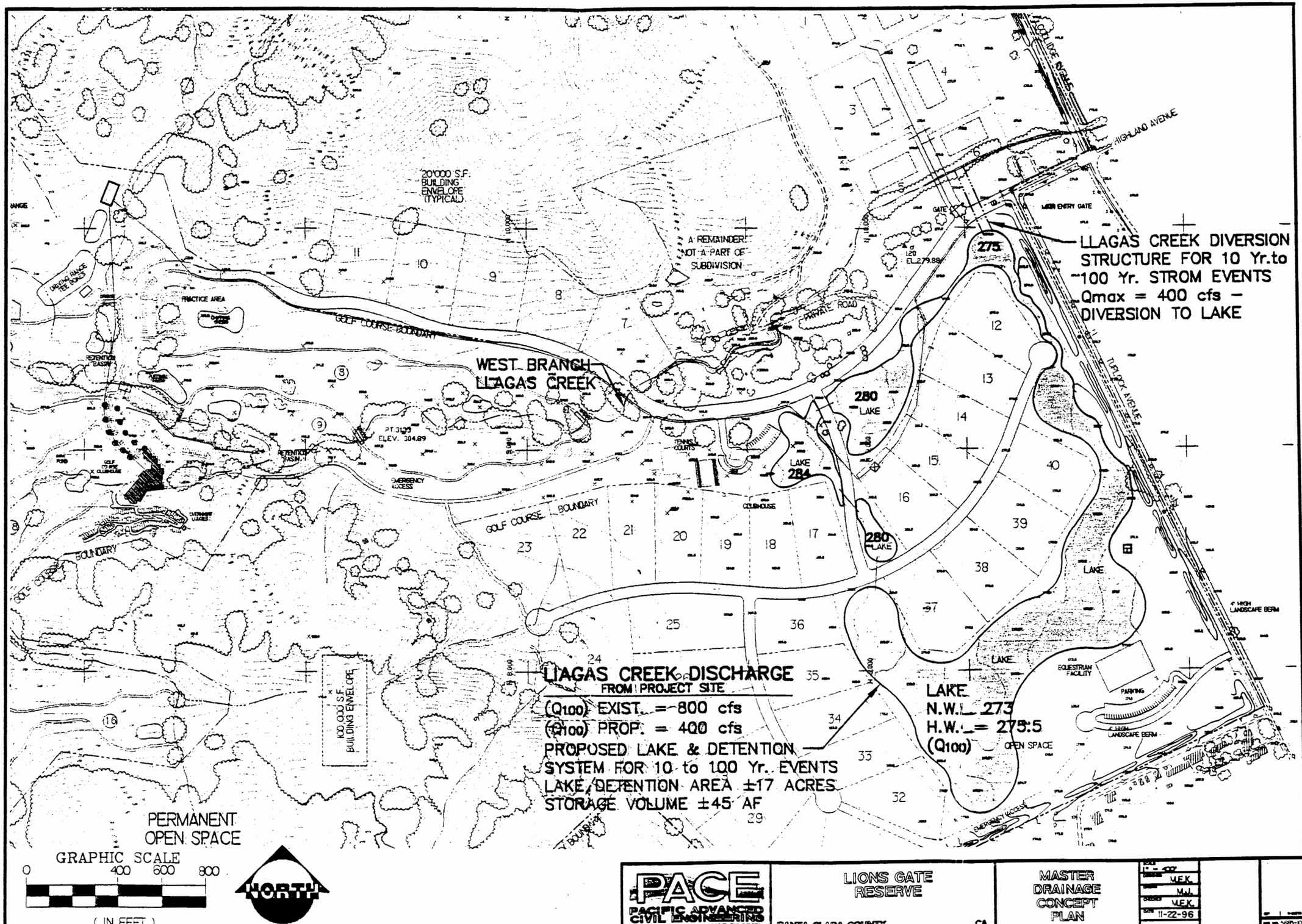

20,000 S.F. BUILDING ENVELOPE (TYPICAL)
A REMAINDER NOT A PART OF SUBDIVISION
GOLF COURSE BOUNDARY
WEST BRANCH LLAGAS CREEK
PRIVATE ROAD
HIGHLAND AVENUE
MAIN ENTRY GATE
LLAGAS CREEK DIVERSION STRUCTURE FOR 10 Yr.to 100 Yr. STROM EVENTS Qmax = 400 cfs — DIVERSION TO LAKE
PRACTICE AREA
DRIVING RANGE TEE BOXES
DETENTION BASIN
GOLF COURSE CLUBHOUSE
EMERGENCY ACCESS
TENNIS COURTS
CLUBHOUSE
TURLOCK AVENUE
LAKE 280
LAKE 284
LAKE
EQUESTRIAN FACILITY
PARKING
6' HIGH LANDSCAPE BERM
OPEN SPACE
100,000 S.F. BUILDING ENVELOPE
LLAGAS CREEK DISCHARGE FROM PROJECT SITE
(Q100) EXIST. = 800 cfs
(Q100) PROP. = 400 cfs
PROPOSED LAKE & DETENTION SYSTEM FOR 10 to 100 Yr. EVENTS
LAKE/DETENTION AREA ±17 ACRES
STORAGE VOLUME ±45 AF
LAKE
N.W.L. = 273
H.W.L. = 275.5
(Q100)
PERMANENT OPEN SPACE
GRAPHIC SCALE
0 400 600 800
(IN FEET)
NORTH
PACE
PACIFIC ADVANCED CIVIL ENGINEERING
LIONS GATE RESERVE
SANTA CLARA COUNTY, CA.
MASTER DRAINAGE CONCEPT PLAN
M.E.K.
M.J.
M.E.K.
11-22-96
PATH O:\5685\5685-10\WORKDWGS\WMFCP-XHBT2.DWG XREF: 568510-BASE.DWG PLOT DATE: 11/22/96

FIGURE 13a

occur under existing conditions. The outflow from the ~~pond~~ lake would only occur when the water level in the creek is low. Therefore, the outflow from the pond would not contribute to the existing flood problems from the creek channel.

~~The proposed pond in the residential development would include an overflow spillway release for larger flood events, and an active detention storage volume between the normal water level and the spillway crest. Based on a preliminary design which includes 2 feet of active detention storage below the spillway crest and one foot of storage above the spillway crest, the proposed pond could contain approximately two thirds of the total runoff from the residential development area and the upstream hillside area during the 10 year 24 hour design storm. The pond would release approximately 30 cfs over the spillway to Turlock Avenue during the 10 year storm. This would be significantly less than the existing condition peak flow rate of 120 cfs. For smaller flood events there generally would be no spill from the pond, and runoff stored in the pond would be released to the creek after the high water levels in the creek have receded. The outlet to the creek would release approximately 20 cfs to drain the active storage volume of the pond in 24 hours after the storm.~~

~~During the 100 year 24 hour flood event, the total runoff to the lake would be approximately 125 acre feet. With no outlet release to the creek during the storm, the pond would overflow to Turlock Avenue once the active storage has filled. The estimated peak overflow would be 140 cfs for the 100 year flood. The existing peak runoff from the site during the 100 year event is estimated to be 236 cfs. Thus, although the shallow flooding along Turlock Avenue that occurs during the 100 year event under current conditions would not be eliminated, it would be substantially reduced by the flood control elements to be incorporated into the project.~~

~~The only potential adverse effect of increased peak runoff from the hillside cluster residential development site would be to increase the peak flow in West Branch Llagas Creek downstream of the project. Due to the operation of the outlet from the pond, this could only occur once the high water levels in the creek have receded and the potential for downstream flooding has passed. Therefore, there would be no increase in downstream flooding. The low flows in the creek would continue for a longer time after a storm due to the releases from the detention pond. This should not be a significant impact.~~

Since the residential lake would be sized to contain a substantial portion of the 100-year peak flow, the shallow flooding that occurs along the Turlock and Coolidge Avenue frontage areas of the site during the 100-year event would be significantly reduced (see discussion under 'Impact 2' below).

The equestrian center area in the southeast portion of the project site would not drain to the pond in the residential development area. Due to the site topography, there would be a berm between the equestrian center and the pond to contain the pond. The maximum height of the berm would be approximately 7 feet. The equestrian center would continue to drain to Turlock Avenue and ultimately to West Branch Llagas Creek. Because of the limited impervious area associated with the equestrian center, there should be no increase in runoff from the area after the project. In addition, the proposed equestrian center would include a detention pond for water quality purposes.

Impact 2. **Portions of the residential cluster subdivisions would be subject to shallow flooding (one foot average depth) during a 100-year event, and the proposed dwellings could also potentially obstruct this sheet flow through the site. However, the total area of the site subject to shallow flooding would be reduced by flood control improvements included in the project. (Potential Significant Impact)**

Based on the revisions to the existing Flood Insurance Rate Map, shown in Figure 13, the West Branch Llagas Creek would overflow to the south upstream of Turlock Avenue (i.e., at the on-site ranch complex). For the 100-year flood, approximately 400 cubic feet per second would cross through the northeastern portion of the cluster residential development, in particular through Lots 12, 13 and 14 at the northeast corner of the subdivision. This mapped overflow crosses the site and Turlock Avenue to rejoin West Branch Llagas Creek 500 to 1,000 feet downstream of Highland Avenue. The overflow is indicated as shallow flooding with an average depth of one foot, indicating that the proposed lots would be prone to flooding. In addition, grading for the residential lots in the overflow area could adversely affect the sheetflow through the area if the flow is obstructed. Similarly, grading for the access road the project and landscaping along Turlock Avenue could affect the sheetflow across the site.

The revised flood maps also show an overflow to the north from West Branch Llagas Creek upstream of Coolidge Avenue. For the 100-year flood, approximately 355 cubic feet per second would cross through proposed the rural residential development north of Highland Avenue and west of Coolidge Avenue. The overflow would flow overland to rejoin West Branch Llagas Creek at the culvert under Highland Avenue. Part of the overflow is designated as shallow flooding with an average depth of one foot, and a small sliver along the north boundary is indicated for flood depths of 0.5 to 2.5 feet. All six of the 5-acre lots are within the mapped 100-year floodplain area and thus would be prone to flooding. Also, grading for the residential lots and cul-de-sac in the floodplain could have an adverse affect on the sheetflow if flow is obstructed.

Both the area subject to potential sheet flooding and the volume of flood water spilled would be substantially reduced by the flood diversion and storage facilities described under 'Mitigation 1' above. The residential lake would detain the increment of runoff generated by the project in addition to approximately 400 cfs of the peak flow during the 100-year event, which would represent approximately one-half of the overland flows overspilling the creek west of Coolidge/Turlock Avenues on the project site during the 100-year event. The precise reduction in flood plain area would be calculated in conjunction with the preparation of the Final Master Drainage Plan for the project.

Mitigation 2. **Potential impacts to the residential subdivisions from shallow flooding would be mitigated by constructing building pads on fills raised above flood elevations. The potential obstruction of sheetflows by the proposed development would be mitigated by balancing fills with cuts within the flood-prone areas.**

The potential impact of placing a portion of the proposed residential development within the 100-year floodplain areas would be mitigated by balancing the grading within the 100-year

floodplain. This would mean that fills required to elevate building pads above flood elevations would need to be balanced by cut areas to allow flood flows between the buildings. This procedure is generally most effective in shallow flooding areas with limited building coverage as in the proposed project. If the buildings cover a large percentage of the floodplain and are in deeper flood area, and effective balance between cut and fill would be problematic. For instance, if a building obstructs 50 percent of the floodplain in 3 feet of flood depth, the building pads would have to be elevated 3 feet, and the remainder of the floodplain would have to be excavated 3 feet to balance the cut and fill. This would lead to an elevation difference of 6 feet between the building pads and the adjacent ground. In the proposed project, the building densities would be very low with 2 to 3 acre residential lots. Thus, building elevations of 1 to 2 feet above existing grade would become 2 to 3 feet or less above the new ground elevations because of the larger area available to balance the fill.

Conclusion. **With implementation of the above mitigations as proposed in the project, the potential flooding impacts of the project would be reduced to less-than-significant levels.**

Q. WASTEWATER TREATMENT AND DISPOSAL

The following discussion is ~~largely~~ based on the following reports: Wastewater Feasibility Study for Lion's Gate Reserve prepared by Questa Engineering in December 1995; and Preliminary Design Report for the Lion's Gate Reserve Project Wastewater System prepared by Pacific Advanced Civil Engineering in December 1996. These reports are contained in Appendix N.

Environmental Setting

No public sanitary sewer system exists on the project site or in adjacent areas. The nearest public sanitary sewer system is located in the City of Morgan Hill, approximately one mile north of the project site.

The existing wastewater facilities for the on-site residences located on Highland Avenue consist of individual septic systems, which appear to be functioning normally.

Ordinances and Regulations that Address Wastewater

Sewage Disposal Ordinance: This ordinance establishes standards for the approval, installation and operation of individual, on-site sewage disposal systems (septic tank and leachfields) consistent with the appropriate California Regional Water Quality Control Board standards and basin plans. These standards are adopted so as to preclude the creation of health hazards and nuisance conditions and to protect surface and groundwater quality. Systems generating more than 2,500 gallons per day of effluent must be reviewed by the appropriate Regional Water Quality Control Board. Percolation tests are required to determine the suitability of a site for leachfields and to determine the amount of leachfields required. The systems are required to be set back a minimum distance from wells, creeks, reservoirs, springs, etc. The County Department of Environmental Health implements this Ordinance and issues the required septic tank permits.

~~County Ordinance Code - Chapter II, Article 3, Private Sewage Disposal in Lexington Basin: This ordinance sets additional requirements for the establishment of sewage disposal systems in the Lexington Basin. All lands within the basin have been mapped according to septic suitability, with varying design criteria, including minimum lot sizes, stipulated for each zone. In areas with poor septic suitability ratings, the ordinance requires installation of a second drainfield in the event of failure of the first leachfield. The ordinance requires 10 feet of separation between the leachlines and underlying groundwater table or bedrock.~~

County Zoning Ordinance: Section 47-(d) stipulates use permit findings that waste and sanitation facilities shall satisfy applicable County, state and federal requirements and that the use shall not adversely affect water quality.

Significance Criteria

With respect to wastewater, Appendix G of the CEQA Guidelines states that a project will normally have a significant effect on the environment if it will:

"(f) Substantially degrade water quality;
(g) Contaminate a public water supply; or
(h) Substantially degrade or deplete groundwater resources.
(s) Extend a sewer trunk line with capacity to serve new development."

Impacts and Mitigation

Impact 1. **The proposed project would increase the demand for wastewater treatment and disposal facilities at the site. (Potential Significant Impact)**

The proposed residences, golf course clubhouse, overnight units, swim and tennis center, and equestrian center would significantly increase the wastewater disposal requirements for the property. Although use of the golf facilities would vary seasonally and between weekdays and weekends, wastewater facilities should be designed on the basis of maximum expected daily flows, i.e., assuming 100-percent facility use. In order to calculate overall flows, the maximum wastewater treatment requirements were estimated for each project component, as described below.

Single-Family Residential Units: The project includes 41 custom residential lots. For central wastewater facilities, average flows from single-family residential units are typically estimated to be in the range of about 200 to 250 gallons per day (gpd) per connection. The actual flows will vary depending upon the size, occupancy and character of the residences, and the degree to which water conserving plumbing devices and practices are incorporated in the homes. The recent laws in California requiring low-flow plumbing devices (e.g., 1.6-gallon flush toilets) in new construction have had a measurable effect on wastewater flows; typical flows from new residential areas tend to average less than 200 gpd/house. (A similar project in Monterey County has experienced average daily flows of 150 to 175 gallons per dwelling over a six year period of operation.) To be conservative in planning wastewater facilities for the proposed project, an average daily unit flow estimate of 250 gpd/residence was assumed; this would adequately account for wastewater from a 4 to 5 bedroom (or more) residence on each parcel. On this basis, the total estimated flow contribution from the proposed 41 single-family residences would be 10,250 gpd (average dry weather flow).

Clubhouse: The clubhouse would generate wastewater from the restaurant, the employees and golfers. The flow estimates for each are as follows:

Restaurant: Based on a unit flow of 10 gallons per meal, the total daily flow for a maximum 200 meals would be 2,000 gpd.

Golfers: At a unit flow for restrooms of 5 gpd, 200 golfers would generate a total of 1,000 gpd. Assuming 10 percent of golfers would take showers, at 25 gpd, this would result in an additional 2,000 gpd for showers.

Employees: Up to 30 employees would work in and around the clubhouse on any given day. Based on a unit flow of 15 gpd per employee, the maximum flow would be 450 gpd.

Overnight Lodging: The maximum flows for the 45 overnight units were estimated on the basis of 150 gpd/unit, yielding total flows of 6,750 gpd.

Swim and Tennis Center: These facilities would be available for use by residents, corporate members and their guests. The facilities would include restrooms, showers and, perhaps, a small kitchen. Use of these facilities would be greatest in the summer and on weekends, and smallest in the winter and during the week. Accordingly, daily wastewater flows would fluctuate greatly. For planning purposes, the maximum daily flow is estimated to be 500 gpd,

based on 50 visitors/employees per day and a unit flow of 10 gpd/person. In addition, backwash water from the swimming pool filter and occasional draining of the spa at the proposed recreation center would go to the wastewater system and add small volumes to the overall flow (i.e., not more than a few hundred gallons per week; and it would be greater in the warm summer months than in the winter). The spa would likely be drained once or twice per year, contributing about 1,000 to 1,500 gallons of flow to the system at each draining. These flows constitute minor miscellaneous additions that are accounted for by the 1,000 gpd "contingency" contained in the preliminary wastewater flow projections (see Table 17).

Equestrian Center: This facility would have restrooms for employees and visitors. The wastewater flows from the equestrian facility are estimated to be approximately 400 gpd, based on 25 visitors/employees per day at a unit flow of 10 gpd/person, and 150 gpd for the caretaker's residence.

TABLE 17

ESTIMATED WASTEWATER FLOWS*

Activity	Number of Units	Daily Flows	Total (gpd)
Residences	41 houses	250 gpd	10,250
Golf Course Clubhouse			
• Restaurant	200 meals	10 gal/meal	2,000
• Golfers			
• Restroom	200	5 gpd	1,000
• Showers	20	25 gpd	500
• Employees	30	15 gpd	450
Overnight Units	45 rooms	150 gpd	6,750
Practice Range	50 golfers	3 gpd	150
Equestrian Center	25 visitors	10 gpd	250
Subtotal			22,000
Contingency			1,000
Total Project			**23,000**

*This does not include the wastewater flows for the golf course maintenance building (approximately 300 gpd) which would be served by an individual septic system.

The total estimated wastewater flows are summarized in Table 17. Based on the above generation rates, the total wastewater flow for the Lion's Gate project is estimated to be approximately 23,000 gpd. This includes a contingency of approximately 5 percent to account for uncertainties about the specific details of project facilities that would not be determined until the design stage. Final wastewater facility design would also need to anticipate and provide for peak flow conditions which, on a daily basis, may be in order of 25 to 30 percent higher than the average daily flow. For the proposed project this translates to a peak system flow estimate of about 30,000 gpd.

Mitigation 1. Increased wastewater from the project would be treated and disposed of with new facilities to be constructed in conjunction with the project.

The proposed method of wastewater treatment and disposal for Lion's Gate project involves a central collection, treatment and disposal system for the golf course facilities (except the maintenance facility) and all of the residential development. The various elements of this system are described below and shown in Figure 23 (Revised). For a more detailed description of the treatment system and process, see Preliminary Design Report for the Lion's Gate Reserve Project Wastewater System prepared by Pacific Advanced Civil Engineering in December 1996, which is contained in Appendix N.

~~Septic Tanks: Each residential lot, the clubhouse/overnight complex and the equestrian center would be provided with septic tanks where primary effluent treatment (i.e., sedimentation) would occur. The effluent from the tank would then be piped to centralized treatment and disposal facilities (described below) instead of individual leachfields.~~

~~Collection System: The collection system would consist of a network of small diameter plastic pipes. The flow from the septic tanks to the collection system would be generally by gravity, although some pumping units would be required where septic tanks are at lower elevations.~~

~~Transmission Line/Pump Stations: The collection system would consist of 2 to 4 inch diameter PVC pipe which would convey all septic tank effluent to a central treatment plant, to be located north of the practice range. The collection system would have two major branches: one branch to serve the residential units, equestrian facility and the swim and tennis center; and a second branch to serve the golf course clubhouse and overnight lodging units. Both branches would require a central pump station, located approximately as shown in Figure 23.~~

~~Treatment Facility: As noted above, primary sedimentation is to be provided by the individual on-lot septic tanks. The remaining treatment would be provided by a central treatment plant, to be located adjacent to the practice range. The treatment plant would occupy an area of about 3,000 to 4,000 square feet. The plant would consist of a fully enclosed proprietary "package" system that would produce secondary level effluent quality. The plant would include the following elements: (a) below ground, built in place concrete vaults for sedimentation and clarification; (b) oxidation process for secondary treatment; and (c) liquid chlorination system for disinfection.~~

~~Storage Facilities: The wastewater facilities would include short term emergency storage and long term wet weather storage, as described below.~~

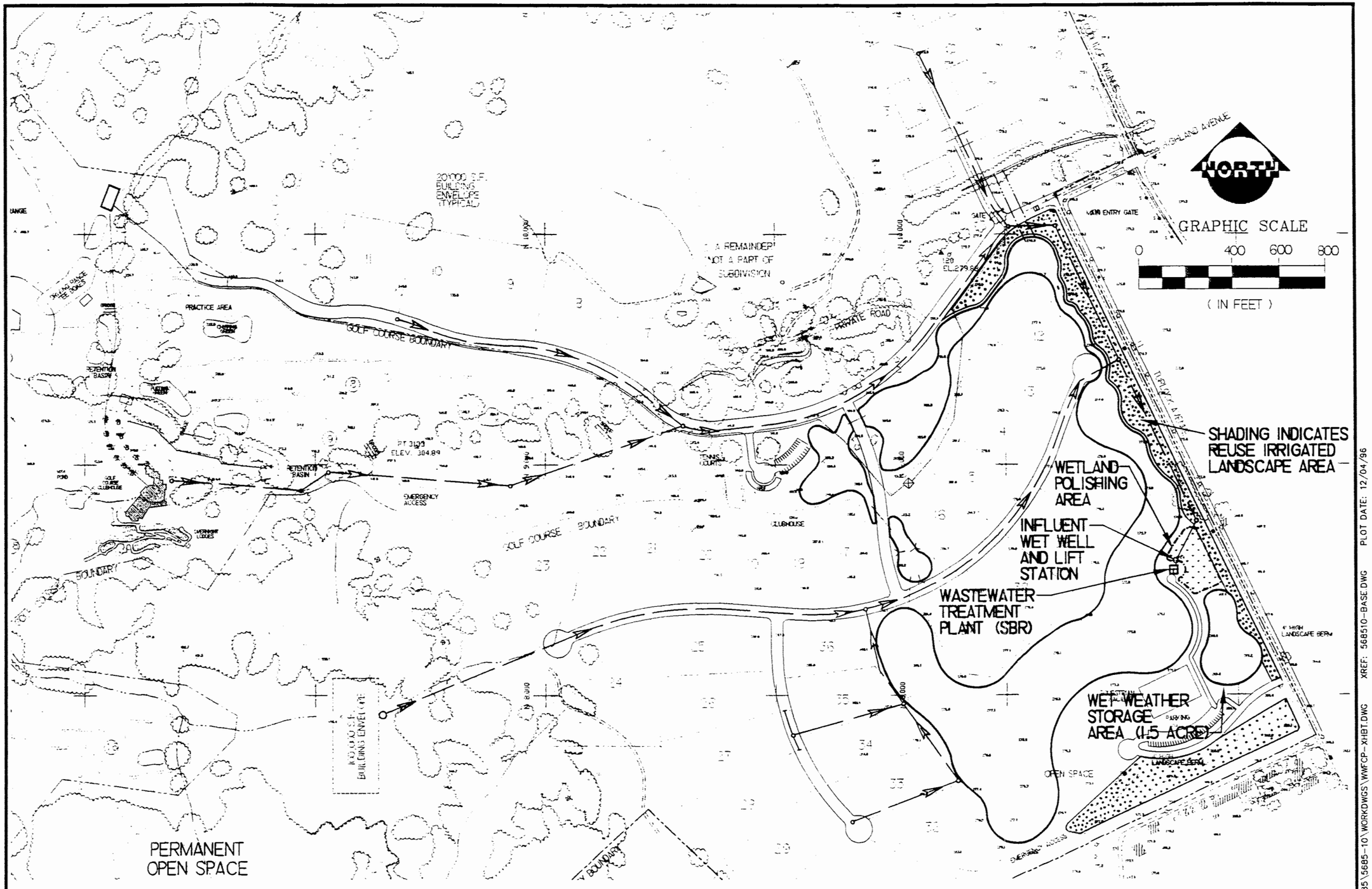

NORTH
GRAPHIC SCALE
0 400 600 800
(IN FEET)
SHADING INDICATES REUSE IRRIGATED LANDSCAPE AREA
WETLAND POLISHING AREA
INFLUENT WET WELL AND LIFT STATION
WASTEWATER TREATMENT PLANT (SBR)
WET WEATHER STORAGE AREA (1.5 ACRE)
PERMANENT OPEN SPACE
GOLF COURSE BOUNDARY
PRIVATE ROAD
HIGHLAND AVENUE
MAIN ENTRY GATE
EMERGENCY ACCESS
OPEN SPACE
LEGEND
GRAVITY SEWER
PACE
PACIFIC ADVANCED CIVIL ENGINEERING
LIONS GATE
GILROY, CALIF.
WASTEWATER FACILITIES CONCEPT PLAN
W.P.R.
M.J.
W.P.R.
12-05-96
PATH O:\5685\5685-10\WORKDWGS\WWFCP-XHBT.DWG XREF: 568510-BASE.DWG PLOT DATE: 12/04/96

FIGURE 23

~~Short-term Emergency Storage: Short-term emergency storage for one day of peak flow would be provided by underground tanks located alongside the treatment plant, and would have a capacity of 30,000 gallons. Each of the pump stations in the collection system would also have emergency storage capacity, roughly equal to one day of sewage flow from the respective service area, bringing the total emergency storage in the system to about two days of flow. The sewer pump stations would include alarm systems with auto dialers and standby generator(s) for emergency power. This would ensure continuous pump station operation during power outages or mechanical breakdown of an individual pump. Emergency power would be provided by a dedicated unit at each pump station.~~

~~Long-term Wet Weather Storage: Long-term (90 day) storage of treated wastewater during the wet season would be provided by a storage pond to be located in the "saddle" area immediately upslope and to the northwest of the practice range. The storage pond would be roughly 16 feet deep (at capacity), with an additional two feet of freeboard and an overall maximum water surface area of about 30,000 square feet. The storage volume of the pond at capacity would be approximately 8 acre feet. The pond would be lined with a clay, plastic or gunite liner to prevent leakage.~~

~~Disposal Facilities: Treated wastewater would be disposed of entirely by spray irrigation of restricted access turf grass and open space portions of the project. The areas planned for irrigation include the golf course practice range and chipping area, plus about 3 to 4 acres of open space grassland knolls on the west side of the storage pond (see Figure 23). The overall land area required for irrigation is estimated to be about 12 acres. This is based on the assumption of an 8 month irrigation season (roughly March through November). The calculations are based solely on the evapotranspiration requirements for irrigated pasture; they assume negligible loss of water to percolation. The total volume of reclaimed water to be disposed of during the irrigation season includes the daily wastewater flow during the irrigation season, plus all wastewater and rainfall collected in the storage reservoir during the winter months. The total volume is estimated to be about 28.2 acre feet in a wet rainfall year.~~

Collection System: The wastewater generated by the residential area and golf course facilities would be collected in 8-inch gravity flow sewers and conveyed to an advanced treatment facility located near the eastern site boundary approximately 200 feet west of Turlock Avenue. This system would collect all of the sewage generated, unlike the system previously proposed where only the effluent was to be collected for treatment with the solids to be settled out in individual septic tanks. Since the wastewater would be collected by gravity flow, there would be no need for individual step pumps, lift stations or force mains as required under the previously proposed system. (Under the proposed system there would be three small pumps, which would all be located at the treatment plant.) This would result in greater system reliability, with less potential for pump failure, and would also represent a substantial savings in both capital costs and ongoing power and maintenance costs. This configuration would also be preferable to the Regional Water Quality Control Board, which had expressed concern with the potential for failure of the numerous pumps previously proposed.

Treatment Facility: The proposed treatment method would involve tertiary treatment utilizing the Sequencing Batch Reactor (SBR) process, combined with final treatment at a constructed wetland area nearby. (The principal difference between tertiary treatment and the secondary treatment system previously proposed for the project is that tertiary treatment provides a higher level of filtration for the removal of contaminants, heavy metals and suspended solids, and also

provides a higher level of nutrient removal. Under the tertiary treatment process proposed, the treated effluent would contain nitrate concentrations of less than 2 mg/l and a coliform count of less than 2.2/100ml, while secondary treated effluent would contain nitrate levels less than 25 mg/l and a coliform count of less than 23/100ml.) The wetland area would consist of a lined pond two feet deep and planted with wetland species which would provide bio-filtration and biological denitrification. With the tertiary treatment provided by the system, the effluent would meet or exceed Title 22 Reclaimed Water Class II standards for restricted access recreational impoundments.

Since the proposed treatment process would handle all of the sewage generated, the solids would settle out as sludge. (Under the previous proposal, the solids would be retained in individual septic tanks and periodically pumped out and hauled away by tanker trucks.) In the proposed SBR system, the sludge remaining from the treatment process would be periodically removed by tanker truck for disposal and treatment at a municipal wastewater treatment plant, as occurs with septic tank sludge. Sludge removal would occur every three months, when approximately 3,000 gallons of sludge would be removed. Since both the treatment process and sludge storage would occur underwater within a totally enclosed building, and since the treatment process involves a significant amount of aeration, the potential for odor generation is minimal. (See discussion under 'Impact 5' below.)

As mentioned, the treatment plant would be located near the southeast corner of the site to take advantage of gravity flow and reduce pumping requirements. The entire treatment facility, including disinfection tanks, sludge ponds, and controls, would be housed in a one-story building with a low-profile barn-like or residential appearance. The treatment facility would occupy an area measuring 40 feet by 40 feet, and the adjacent constructed wetland would be approximately .75 acres in area (see Figure 2 in the report by Pacific Advanced Civil Engineering, contained in Appendix N). An SBR treatment plant similar to the one proposed has been in operation at the Ciello Vista Estates project in Hollister since 1989. That facility currently serves 76 residences and treats approximately 50,000 gallons of wastewater daily, about double the volume of the proposed treatment facility for the Lion's Gate project. That facility appears as a dwelling located within a residential neighborhood, with the nearest house located 100 feet away. Photographs of this facility are provided in Figure 23a.

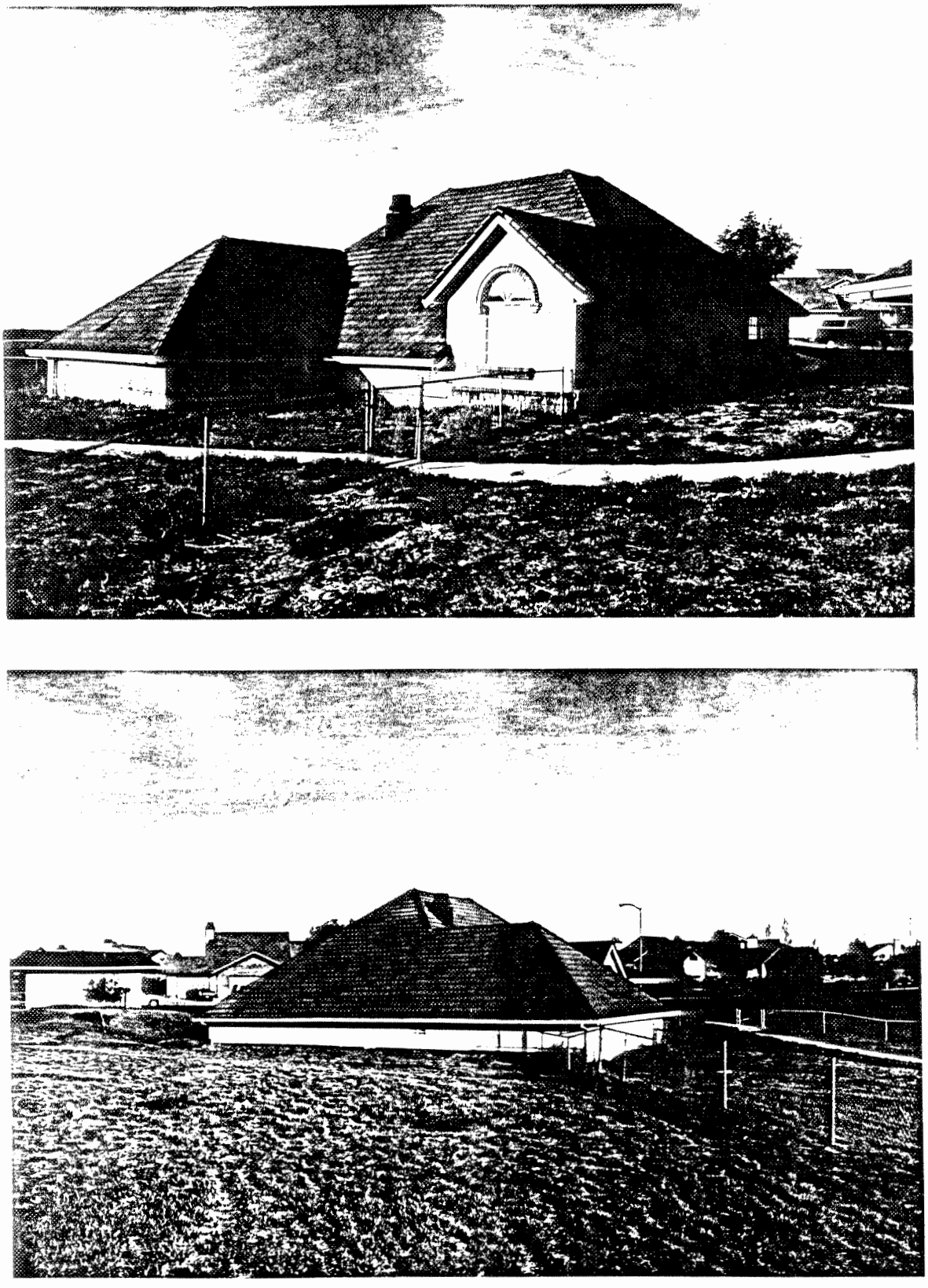
Emergency Power Supply: To provide for uninterrupted power supply in the event of an extended power failure, back-up power source would be provided to pump influent from the wet well to the containment/sludge pond within the treatment plant.

Short-term Emergency Storage: Short-term emergency storage for 24 hours of peak flow required by Title 22 would be provided by the sludge containment pond. In an extreme emergency, an additional 20 days of emergency storage could be provided by the lined constructed wetlands.

Long-term Wet Weather Storage: Long-term (120-day) storage of treated wastewater during the wet season would be provided by a dedicated effluent storage pond to be excavated to the west of the treatment plant. The pond would appear as part of the residential lakes proposed for this area, but in fact would be a separate impoundment. The pond would have a capacity of 6.4 acre-feet and would occupy 1.75 acres. The pond would be lined with either clay or PVC depending on soil suitability; the liner would be backfilled with a minimum of 18 inches of soil and landscaped to blend in with the surrounding area.

SEQUENTIAL BATCH REACTOR TREATMENT PLANT

Hollister, California



100,000 gallon per day facility in residential neighborhood, enclosed in house structure
Fluidyne, Inc. SBR Equipment

FIGURE 23a

Since the pond would contain tertiary treated effluent, it would meet or exceed the Title 22 standards for restricted access recreational impoundments. This means that the level of treatment would be sufficient to allow incidental body contact but not total body contact. The lake and irrigated areas would be posted with the required signage for usage of reclaimed water. (See discussion under 'Impact 3' below.)

Effluent Disposal: The treated effluent would exceed the required level of disinfection for unrestricted landscape irrigation, and would be applied over the frontage landscaped area. It is estimated that enough reclaimed water would be generated to provide irrigation water for 8 acres of landscaped area.

Solids Disposal: Every three months, approximately 3,000 gallons of liquid sludge would be transported by tanker truck to a nearby large scale municipal treatment facility for sludge processing and disposal. Sludge processing is an ongoing process at large-scale facilities with belt presses and/or sludge drying beds. The transported sludge is highly aerated and easily introduced into the processing system. The previously proposed system of septic tanks would also require hauling of septage to nearby treatment facilities. However, septage is in an anaerobic condition and is not compatible for easy disposal in most activated oxygen type treatment facilities. The facilities have to introduce the septage slowly, so as not to upset the balance in the treatment system biomass. Therefore, disposal of sludge is generally less problematic than disposal of septic tank septage. Preliminary discussions with representatives of the South County Regional Wastewater Authority indicate that the nearest municipal wastewater treatment plant at Gilroy should have no technical difficulty accepting the relatively small quantity of sludge generated by the project. However, acceptance of the project's sludge for treatment and disposal is subject to approval by the Board of Directors for the Authority (Jay Baksa, Authority Manager, personal communication).

Facility Operation and Maintenance: The proposed community wastewater system would be owned and operated by the Community Services District (CSD) established for the project. Since the system would generate more than 2,500 gallons of effluent per day, it would be under the jurisdiction of the Central Coast Regional Water Quality Control Board; as such, the system would require a waste discharge permit from the Regional Board. The CSD would be the responsibility party (i.e., "discharger") named in the Waste Discharge Requirements (i.e., permit) issued by the Regional Board for the facility. Actual day-to-day operations could be performed by employees of the CSD or by contractors. However, the CSD would have ultimate responsibility for compliance with the Waste Discharge Requirements and the submittal of monitoring reports to the Regional Board.

With respect to day-to-day operations, Title 22 of the California Administrative Code contains specific requirements for monitoring, record keeping and treatment plant maintenance to assure public health protection. A certified wastewater treatment plant operator would be required for the treatment plant. It is anticipated that testing and regularly scheduled maintenance would require less than 20 hours per week for a well-trained individual with maintenance help as required. The SBR equipment manufacturer would provide a detailed operation and maintenance manual including regularly scheduled maintenance items such as dissolved oxygen sensor calibration. Additionally, the Santa Clara County Sewage Disposal Ordinance requires that community wastewater systems be monitored by the designer for one year, and that the

operator execute a maintenance contract with a sanitary engineering firm for the first 5 years of system operation.

Maintenance Facility

The maintenance facility would not be connected to the centralized wastewater system, but would have its own septic tank and leachfield system. Based on a generation rate of 15 gpd for 15 employees, maximum flows would be 225 gpd. Preliminary soils and groundwater studies indicate that there is adequate depth to groundwater, and that the soils in the vicinity have acceptable percolation rates for the planned leachfield.

Alternative Wastewater Treatment Configurations

Several alternative methods of wastewater treatment and disposal were studied for the Lion's Gate project, as described below.

Individual Residential Septic Systems: The main alternative to the proposed wastewater system would include: a) the use of individual septic systems for each residential lot (and the equestrian center, and the swim and tennis center); and b) a separate package treatment plant, storage pond and spray irrigation system solely for the golf course clubhouse and lodging units. This alternative is feasible as studies to date have verified adequate soil depth/groundwater conditions to support individual septic systems at the residential building sites. The layout of the residential sites has been planned to match the septic system options and limitations. A package treatment plant system for the golf course facilities is also feasible. It would be about one-half the size and capacity of the proposed wastewater system to serve the entire development. The advantages of the proposed wastewater plan over this option of utilizing residential septic systems are as follows:

- All wastewater treatment and disposal would come under the maintenance and management authority of a public district and certified wastewater personnel;

- A greater percentage of the wastewater would be made available for reclamation and reuse for irrigation of a portion of the golf course (the practice areas), reducing the demand on other irrigation water sources; and,

- The overall nitrate loading from the project would be reduced, since the secondary treatment followed by irrigation removes a substantially greater amount of nitrate than do individual septic tank-leachfield systems. The use of package treatment plants with spray irrigation is identified as a nitrate control management objective in the Santa Clara Valley Water District's draft plan for the Llagas Groundwater Basin.

~~The one advantage of the individual residential septic system option would be the elimination of the effluent collection system (and its associated pump stations and piping) in favor of a simple, on-site gravity flow system at each house.~~

~~Conventional Gravity Sewers: Conventional gravity sewers, as opposed to effluent only sewers, were considered as a system design option. Conventional sewers would eliminate the need for a septic tank at each house/building, but the construction costs and excavation~~

~~requirement for larger diameter gravity sewers, manholes and lift stations spread over the development area would offset the savings. The on site treatment plant could be designed to accommodate either effluent or raw sewage from a conventional sewer system. If conventional sewers were to be used, an additional screening and sludge handling process would be included at the treatment plant. Ultimately, disposal of the sludge would be by hauling to an approved landfill site. An advantage of the system design proposed for the project is the ability to build in surplus storage or emergency disposal capacity at the stations or individual building sites with the use of subsurface leachfield trenches. This is possible because of the inclusion of septic tanks for primary treatment at each house/building. Septic tank effluent can be disposed in appropriately sited leaching trenches, but raw sewage cannot.~~

Effluent-Only Sewers and Secondary Treatment: Effluent-only sewers were previously proposed for the project. Instead of collecting all sewage for treatment at a central treatment plant, this would entail the installation of individual septic tanks, but not leachfields, at each homesite, and also at the clubhouse and overnight accommodations complex. The septic tanks would provide primary effluent treatment (i.e., sedimentation) with the effluent from each tank piped to the treatment plant for further treatment. One benefit of this collection system is that it reduces construction costs due to the smaller diameter pipes, and it provides additional emergency storage capacity in the individual septic tanks. Effluent-only sewers are less attractive when the collection system operates entirely by gravity, as is currently proposed, where reduction of pumping costs is not a consideration. In addition, effluent-only sewers require regular pumping of septic tanks at individual homesites and golf facilities, which involves some inconvenience to homeowners and the golf course operator.

From an environmental standpoint, this alternative would achieve far less removal of nitrates than the system proposed. Since the wastewater would receive only secondary treatment, the total nitrogen concentration in effluent from the treatment plant would be approximately 25 mg/l, although natural denitrification at the storage pond would be expected to reduce this to 3 to 4 mg/l at the time of final discharge to the irrigation system. In the proposed system, the wastewater would receive tertiary treatment, resulting in the removal of total nitrogen to less than 2 mg/l.

Municipal Sewerage: The possibility of extending sewer service from the City of Morgan Hill to the project site was considered in connection with prior development plans for the project site. The project site is not within the sewer service area for the Morgan Hill/Gilroy Wastewater Treatment Plant and would require annexation and several miles of sewer pipeline construction. Due to the relatively small wastewater flows from the Lion's Gate project, and the substantial distance to the Morgan Hill/Gilroy system, sewer connection to the system would not be a practical alternative.

Impact 2. **The proposed wastewater disposal facilities may result in degradation of surface and groundwater quality. (Potential Significant Impact)**

Under proper operation, the proposed disposal of wastewater to land should not result in any noticeable impacts on surface water quality in local drainages or the West Branch of Llagas Creek. This is because the system would be subject to the Regional Board's standard requirement that there be no runoff of wastewater from any spray disposal area into streams or

drainages; and the spray disposal operations are planned to be confined to the irrigation season only. To further minimize the risks of reclaimed water runoff into streams, the proposed spray areas are to be set back 100 feet or more from local drainages. (Note: Treated effluent would be applied to the spray irrigation area at rates matching the evapotranspiration rate of the practice range turfgrass. Also spray irrigation would not occur during the winter months when the turfed areas are likely to be saturated. Thus, there is no potential for treated effluent to leach or run off into on-site drainages.)

A critical water quality concern in the Llagas Groundwater Basin area, where the Lion's Gate project is located, is the concentration of nitrate in groundwater. The Llagas Groundwater Basin has documented high levels of nitrate attributable to agricultural wastes and fertilizer, wastewater disposal and other land use activities. Sources of nitrate loading from the Lion's Gate project would include golf course fertilizers and on-site wastewater disposal. The nitrate analysis for golf course fertilizers prepared by Audubon Conservation Services (see Appendix E), estimated an annual nitrogen loading ranging from 262 lbs to 1,965 lbs of nitrogen, with a resultant nitrate-nitrogen concentration ranging from 0.6 mg/l to 4.5 mg/l reaching the groundwater. The mass nitrate-nitrogen loading from wastewater disposal is estimated conservatively to be about ~~263~~ 21 lbs per year. The combined total nitrogen loading for golf course fertilizers and wastewater disposal is estimated to be ~~525~~ 283 to ~~2,228~~ 1986 lbs per year, which equates to projected groundwater concentration of ~~1.2~~ 0.7 mg/l to ~~5.1~~ 4.6 mg/l. (The equivalent concentration as NO3 would be from ~~5~~ 3 to ~~23~~ 20 mg/l.) These nitrate loading calculations are a prediction of long-term cumulative nitrate levels resulting from the project, based on average annual conditions.

The nitrate loading analysis is based on very conservative (i.e., worst case) assumptions for the nitrogen content of treatment plant effluent (25 mg/l), nitrogen removal rate in the storage pond (40%), and uptake by the soils and vegetation (75%). Higher nitrogen removal rates are attainable with plant design (e.g., Sequencing Batch Reactor or SBR) or through an operating mode specifically selected to optimize nitrogen removal. A good example of the latter is the Las Palmas Ranch Wastewater Reclamation plant in Monterey County, which has a waste discharge limit of 10 mg/l nitrate-nitrogen set by the Central Coast Regional Water Quality Control Board. The total nitrogen concentration in effluent from the treatment plant ranges from 18 to 24 mg/l (as compared with our estimate of ~~25~~ 2 mg/l); ~~but, the final discharge from the storage pond is typically in the range of 3 to 4 mg/l, due to denitrification in the pond. Uptake by turf grass and soils in the irrigation area further reduces the concentration of nitrate-nitrogen reaching groundwater (probably to 1 to 2 mg/l, or less). Based on the demonstrated performance of the Las Palmas Ranch facility, reduction of nitrate concentrations to very low levels, e.g., a few mg/l, is feasible; however, a "zero nitrate discharge" is not an achievable or realistic standard~~. given the very low nitrate levels in the treated effluent, any additional denitrification in the effluent storage pond would be negligible.

The existing groundwater nitrate concentrations in the vicinity of the project site (at San Martin), as reported in the SCVWD Llagas Groundwater Basin Nitrate Study (November 1995), are indicated to be in the range of about 7 to 43 mg/l (as NO3). Historic sampling of a water well on the project site is also reported to fall within this range. The Lion's Gate project site is currently used for cattle grazing; and nitrogen associated with cow manure and urine represents the main current source of nitrate loading to groundwater and surface water runoff. Generally, in pasture and rangeland situations the majority of nitrogen in animal wastes is readily assimilated into the soil and vegetation. However, where soils are damp, where animals

congregate and where they have direct access to streams and other drainages, a portion of the nitrogen will be carried by runoff or percolate into the groundwater. These are likely the current routes of nitrogen input to the Llagas Groundwater Basin from the project site.

Under the proposed project, the cattle grazing is planned to be entirely eliminated in favor of the golf course and residential development. From a nitrogen loading standpoint, the turf fertilizer and reclaimed wastewater would essentially replace animal wastes as the principal source of nitrate on the project site. Because of the slow rate of groundwater movement, it is likely to take several years for any changes in water quality to be noticeable. Moreover, as indicated by the water-chemical mass balance analysis in the wastewater feasibility study, the nitrate loading (in terms of resultant concentration) from the project is estimated to be roughly comparable to existing background groundwater conditions (i.e., ~~5~~ 3 to ~~23~~ 20 mg/l under project conditions, versus 7 to 43 mg/l under existing conditions). Thus, any long-term change in groundwater nitrate concentration is likely to be very slight and difficult to discern.

There is a slight possibility of leakage or spill of wastewater during a major earthquake. However, since the package wastewater treatment plant facilities would consist largely of below ground tankage, the potential consequence of failure or release of wastewater during an earthquake would likely be insignificant. In the unlikely event of a spill, wastewater would be directed to the lined wetland area nearby which has many times the storage capacity of the treatment plant. However, this is a valid issue which would be covered in the "Contingency Plan," which is a standard element of the Waste Discharge Requirements that would be adopted for the wastewater facilities by the Regional Water Board.

Mitigation 2. **Groundwater wells would monitor groundwater quality up-gradient and down-gradient of the proposed spray irrigation area and the storage ponds, with corrective action taken as necessary.**

Groundwater at the project site would be monitored as a precautionary measure in connection with the wastewater disposal systems and the golf course maintenance activities. All of the existing water wells on the property and the new proposed irrigation well would be periodically monitored for nitrate. Additionally, ~~a dedicated monitoring well~~ groundwater quality monitoring would be performed within and ~~immediately down gradient (east) of the wastewater spray field areas (practice range and chipping areas)~~ reuse irrigation areas and the storage pond and constructed wetland. would be added to distinguish possible localized effects from the wastewater systems. The Regional Board may also require that additional monitoring wells be installed. This would provide a basis for detecting any changes over time and for making adjustments in fertilizer application rates or wastewater operations. ~~In the unlikely event that evidence of contamination is found, corrective action could include incorporating additional treatment processes to further reduce nitrate levels prior to disposal.~~ (The specific measures to be taken would be stipulated in the "Contingency Plan" for the treatment operation, which is a standard element of the Waste Discharge Requirements contained in the "permit" from the Regional Board.) In addition, surface water upstream and downstream of the spray irrigation area would also be monitored for water quality.

Impact 3. **The use of reclaimed wastewater for ~~golf course~~ landscape irrigation and storage of the treated effluent near the residential area ~~would~~ could expose humans to possible physical contact with the treated wastewater, resulting in a potential public health hazard. (Potential Significant Impact)**

~~The areas planned for spray disposal of treated effluent include the golf course practice and chipping area and the grassy hillside knolls adjacent to the proposed wastewater storage pond.~~

Unlike secondary treatment previously proposed, the tertiary treated water in the current proposal can be used for unrestricted landscape irrigation. Since incidental body contact with this level of treated effluent is permissible under Title 22, the public health risk to residents making casual contact with the irrigation water would be virtually nil.

Unlike the storage pond for secondary treated effluent previously proposed, the storage pond for tertiary treated effluent currently proposed would be 'a restricted access recreational impoundment' under Title 22, where incidental body contact would be permitted but total body contact would not. Thus there would be a some public health risk in the unlikely event that individuals were to engage in total body contact activity in the lake, such as swimming.

~~**Mitigation 3. The wastewater would be treated to levels deemed acceptable for disposal on golf courses, and the areas affected would be posted to notify golfers and employees where irrigation by treated wastewater is occurring.**~~

~~State wastewater reclamation criteria recognize golf course irrigation as a suitable use for treated wastewater, and contain standards to protect against unacceptable risks to public health. The areas to be irrigated with treated wastewater would have restricted access and activities, and limited opportunity for human contact with the treated wastewater. The areas of the golf course proposed for irrigation are the practice range, which would be accessible primarily to maintenance staff, and the chipping area, which would have more general accessibility to the golfers. Both areas should be posted with appropriate signs indicating the irrigation with reclaimed water; and irrigation of these areas would need to be limited to times when people are not present, i.e., evenings. The other areas planned for irrigation are grassland knolls that are well removed from general public access. These sites would be part of the permanent open space area and would be accessible to an occasional hiker or horseback rider. Evening spray disposal in those areas is also recommended.~~

~~With diligent compliance with waste discharge requirements, the risks to public health would be minimal. However, if desired, the wastewater system could be upgraded and operated to meet the treatment standards for unrestricted landscape irrigation, as defined in Title 22 of the California Administrative Code.~~

Mitigation 3. The wastewater would be treated to tertiary levels which is acceptable for unrestricted landscape irrigation. Signs would be posted at the irrigated landscape area and at the effluent storage pond to notify residents of the presence of reclaimed water.

Since the tertiary level of treatment proposed would result in coliform counts of less than 2.2/100ml, compared with 23/100ml for secondary treatment, there is far less concern with incidental contact with contaminants. Since the reclaimed water would be quite clean, there is no State requirement to fence-off irrigation areas to prevent human incursion. However, signs would be posted within the irrigated landscape area to inform residents that reclaimed effluent is being used. In addition, signs would be posted around the effluent storage pond indicating its use for reclaimed water storage and warning that swimming is not permitted.

Impact 4. **There is a potential for overflow of the storage reservoir, resulting in a public health hazard. (Potential Significant Impact)**

There is the possibility of an overflow from a wastewater storage reservoir during high rainfall years, if the reservoir capacity is exceeded.

Mitigation 4. The wastewater storage reservoir would have sufficient capacity to accommodate high rainfall years.

To minimize or eliminate the possibility of overflow, the reservoir would be sized to include: (a) surplus storage capacity to account for extreme wet weather effects; and (b) two-feet of freeboard in the pond above the projected maximum water depth (which is substantially greater than the amount of rainfall expected in the 100-year/24-hour storm). The calculated winter storage requirement is based on ~~90~~ 120 days with no irrigation. An additional contingency available for a wet winter would be selective spray disposal during the rainy season. In particular, the grassland knolls near the reservoir site would provide suitable winter spray disposal capacity for emergency use without posing a threat of runoff to streams or ponding of treated wastewater in public use areas. In the future, should the wastewater flows exceed the system design, the capacity of the wastewater storage pond could be expanded. Additionally, a reserve leachfield area could be constructed near the treatment plant or pump stations for emergency use.

Impact 5. **The wastewater treatment and disposal system could generate odors. However, since the SBR process proposed involves no odor-producing anaerobic digestion and would be entirely enclosed, no noticeable odors would be generated.**
~~**(Potential Significant Impact)**~~ **(Less-than-Significant Impact)**

~~Odors could be generated within the immediate vicinity of the two main pump stations and at the treatment plant. At the effluent storage pond, odors could be created by algae which could grow in the nutrient laden water.~~

Since the SBR treatment process occurs entirely under water and involves a significant amount of aeration, the potential for odor generation is minimal. In conventional treatment processes, odors are created because the process relies on digestion by methane-producing anaerobic bacteria which exist under conditions where oxygen is absent. The SBR process does not include anaerobic bacteria but relies an digestion by aerobic and anoxic bacteria which do not produce odor-generating methane. Additionally, the constant aeration involved in the SBR process prevents the creation and proliferation of anaerobic bacteria. Also, the sludge would be in an aerated liquid state while on-site and when removed for disposal, thus further reducing the potential for odor problems. No drying or composting of sludge would occur on-site. Instead, the stored sludge would be transferred directly from underwater storage to tanker trucks for disposal at an approved wastewater treatment facility. The entire treatment facility would be completely enclosed in a structure to further eliminate the potential for odor dispersion. As an example, the SBR treatment plant at the Ciello Vista Estates project in Hollister has received no odor complaints since it began operating in 1989 (Ed Lantz, Water Technologies Inc., personal communication). As mentioned, that facility treats approximately

50,000 gallons of wastewater daily, about double the volume of the proposed Lion's Gate facility, and is located 100 feet from the nearest residence, while the Lion's Gate facility would be approximately 400 feet from the nearest existing or proposed dwellings.

The potential for odors to be generated by algae that might form in the constructed wetland area is minimal. The nutrient levels of the effluent entering the wetland would be low and the wetland plants would compete for the sunlight that the algae need. In addition, stagnant water conditions would be avoided by the continuous circulation of water and periodic variations in water levels. There is virtually no potential for algae formation in the effluent storage pond since the nitrate levels in the lake would be below 2 mg/l after final treatment.

Since the proposed system contains no pump stations outside the treatment plant site, the potential for odor generation in the sewage collection system is minimal.

~~**Mitigation 5. Odor control would be achieved by mechanisms incorporated into the design of the pump stations and the treatment plant, and by measures to be undertaken at the effluent storage pond.**~~

~~Odor control at the pump stations would be achieved by venting through subsurface soil "scrubber" trenches, or above ground activated carbon canister type filters. If properly maintained, these measures can be expected to reduce pump station odors to a level of insignificance.~~

~~To eliminate odors at the treatment plant, the plant would be designed to capture and eliminate methane and hydrogen sulfide odors with a vacuum system, and with soil filtration.~~

~~Control measures for algae include: (a) aeration of the wastewater pond; (b) addition of chemicals such as non toxic dyes; and (c) promotion of duck weed to block light penetration. With proper maintenance attention, these measures can be effective in reducing algae problems to less than significant levels.~~

Mitigation 5. No mitigation required.

Impact 6. The existing pond and the proposed open water areas of the project, such as the wastewater storage pond and the residential lake, have the potential to be sites for breeding of mosquitoes, which could create a nuisance and a potential public health problem. (Potential Significant Impact)

Mitigation 6. Mosquito breeding would be controlled by several methods, as appropriate for each type of water body. These methods would include the circulation of water to prevent stagnant conditions, the introduction of mosquito fish, and the application of larvacides. The specific mosquito mitigation measures would be formulated in consultation with the Department of Environmental Health Vector Control District.

~~At the wastewater storage pond, the water would be circulated through the pond, with a portion removed each day for irrigation.~~ Both the constructed wetland and the effluent storage pond would be prevented from becoming breeding areas for mosquitoes and other insects by keeping the water circulating. The turnover and movement of water would interfere with the

mosquito breeding cycle during the warm months. ~~The potential mosquito problem would also be minimized by the remote location of the storage pond which is well away from any residences or golf activity areas~~. At both the effluent storage pond and the constructed wetland, mosquito fish would be appropriate since they would be within a closed system with no potential for the fish to escape. At the existing pond in the central area of the site, and at the proposed lakes for the residential area, the introduction of mosquito fish and the circulation of water would not be appropriate measures for mosquito abatement. Since both of these water bodies would have outlets to West Branch Llagas Creek, the introduction of mosquito fish would risk the escape of the fish resulting in potential disruption of native species. For these ponds, mosquito abatement may require the use of one or more of the following three larvacides: lightweight oil, BTI and methoprene, which can be applied by air or with ground equipment. The oil, which contains surfactants, forms a very thin film on the water surface and essentially suffocates both the larval and pupal stages of the mosquito. The oil tends to dissipate within three or four days, depending on weather conditions. BTI *(Bacillus thuringlensis israelensis)* is a naturally occurring bacterial pathogen of mosquitoes. It is most effective against the larval stages and is approved for use in sensitive habitats by the U.S. Fish and Wildlife Service. Methoprene is an insect growth regulator which prevents the mosquito from developing from the pupal to the adult stage. Extensive research has demonstrated that methoprene has very little impact on non-target organisms, and the U.S. Fish and Wildlife Service has approved its use in sensitive habitats, such as the habitat of the endangered Santa Cruz long-toed salamander.

Prior to design and construction of the new ponds, the Department of Environmental Health Vector Control District would be consulted to ensure a design that will inhibit the development of mosquito breeding.

Impact 7. **The location of the treatment plant near Turlock Avenue could result in potential noise impacts to existing and proposed residences in the vicinity. However, the pumps and aerators at this treatment plant would be largely submerged and entirely enclosed within a building, thus minimizing noise.**
(Less-than-Significant Impact)

In addition to being submerged and enclosed, the aerators would also have mufflers and would be located at least 400 feet from the nearest existing or proposed dwellings. (At the Ciello Vista project in Hollister, noise from the SBR treatment plant is inaudible at the nearest dwellings located 100 feet away.)

Mitigation 7. **No mitigation required.**

Impact 8. **The location of the treatment plant in proximity to existing and proposed dwellings could expose residents to potential release of hazardous materials used in the treatment process. However, this treatment plant would not involve the use or generation of hazardous materials. (Less-than-Significant Impact)**

Although chlorine is often used in the disinfection stage of wastewater treatment, chlorination will not be utilized here. Instead, disinfection will be accomplished by the use of ozone and/or ultraviolet which are not hazardous materials. By not using chlorine there also would be no

need for the chemicals used in dechlorination. In addition, there would be no creation of toxic trihalomethanes (THMs) or other chlorine by-products. The treatment process would not involve the use or generation of any hazardous materials.

Mitigation 8. **No mitigation required.**

Conclusion. **With the installation of the proposed wastewater facilities in accordance with applicable standards, and with the implementation of the mitigation measures set forth above, the potential wastewater and related impacts resulting from the project would be non-significant or would be reduced to less-than-significant levels.**

V. ALTERNATIVES TO THE PROPOSED PROJECT

*

*

G. ALTERNATIVES FOR WASTEWATER TREATMENT AND DISPOSAL

*

*

*

~~**Conventional Gravity Sewers**~~

~~This alternative would involve placing the entire project on conventional gravity sewers. Thus there would be no individual septic tanks at the residential lots of the golf course facilities. The treatment plant would therefore include an additional screening and sludge handling process, with disposal of sludge at an approved landfill site. Also, the treatment plant would require additional emergency storage, to make up for the extra storage provided by the septic tanks and lift stations under the proposed system.~~

~~Since this system would not utilize individual leachfields, the potential nitrate loading would be about the same as for the proposed treatment system. However, the centralized handling and screening of solids at the treatment plant site would result in a greater potential to generate unpleasant odors than the proposed system.~~

~~In other respects, there would be no significant difference in environmental effect between the conventional gravity sewer alternative and the proposed wastewater system.~~

Effluent-Only Sewers and Secondary Treatment

Effluent-only sewers and secondary treatment were previously proposed for the project. Instead of collecting all sewage for treatment at a central treatment plant, this would entail the installation of individual septic tanks, but not leachfields, at each homesite, and also at the clubhouse and overnight accommodations complex. The septic tanks would provide primary treatment (i.e., sedimentation) with the effluent from each tank piped to the treatment plant for further treatment. The process would include secondary treatment, and the effluent would be disinfected to remove most of the pathogens, but the tertiary steps of filtration and denitrification would not be included.

One benefit of this collection system is that it reduces construction costs due to the smaller diameter pipes, and it provides additional emergency storage capacity in the individual septic tanks. Effluent-only sewers are less attractive when the collection system operates entirely by gravity where reduction of pumping costs is not a consideration. In addition, effluent-only sewers require regular pumping of septic tanks at individual homesites and golf facilities, which involves some inconvenience to homeowners and the golf course operator.

From an environmental standpoint, this alternative would achieve far less removal of nitrates and coliform bacteria than the system proposed. Since the wastewater would receive only secondary treatment, the total nitrogen concentration in effluent from the treatment plant would be approximately 25 mg/l, although natural denitrification at the storage pond would be expected to reduce this to 3 to 4 mg/l at the time of final discharge to the irrigation system. In the proposed tertiary treatment system, the total nitrogen contained in the effluent would be less than 2 mg/l. In addition, the coliform count in the tertiary treated effluent would be less than 2.2/100ml, while secondary treated effluent would contain a coliform count of approximately 23/100ml.

In other respects, there would be no significant difference in environmental effect between the effluent-only sewer and secondary treatment alternative and the proposed wastewater system.

Appendix D

Hydrology and Drainage Report

Prepared By

Pacific Advanced Civil Engineering

November 1996

PRELIMINARY DESIGN REPORT

for the

LION'S GATE RESERVE

MASTER DRAINAGE PLAN

Prepared By:

Pacific Advanced Civil Engineering
17902 Georgetown Lane
Huntington Beach, CA 92647

November 22, 1996

#6785

Date: 11/20/96
Job #: 6785E
By: PACE

1. Project Purpose and Need

The enclosed proposed modifications to the project drainage plan are submitted to enhance the previously submitted EIR drainage plan. Similar to the previous plan, the proposed modifications include runoff detention facilities to ensure no increased potential for downstream flooding as a result of the project. In fact, the proposed plan includes more aggressive flood control measures in response to the County's request that the project do more to help alleviate the significant flooding problems that currently exist downstream of the project site.

2. Off-site Drainage

The West Branch of Llagas Creek tributary drainage area (up stream of Coolidge Avenue) includes a majority of the Lion's Gate Reserve Project site. The West Branch of Llagas Creek exits the project site in the easterly boundary just north of the intersection of Coolidge Avenue and Highland Avenue. According to the Santa Clara County drainage engineering section, the West Branch of the Llagas Creek causes significant flooding of areas downstream of the Lion's Gate Reserve project. Therefore, it is critical that on-site developed conditions do not increase the downstream drainage flooding.

In an effort to not only mitigate on-site drainage runoff, but to substantially reduce the downstream flooding, the Lion's Gate Reserve project is proposing the following regional drainage solutions:

A. Provide storm runoff detention via proposed on-site lake/detention system for 10 to 100 year rainfall events.

1. Construct West Branch Llagas Creek stream diversion structure to divert flows above the 10-year event into the lake/detention basin. The proposed diversion structure will consist of a concrete "L" Section in plain view with an open channel conveyance for flows in Llagas Creek for up to 400 cfs. Flows in excess of 400 cfs will pass over side spillway weir to the south and be conveyed to the lake/detention basin. At a high water level of elevation 275, the detention basin will not accept additional run-off and flows in excess of the 100 year storm will overtop the Llagas Creek diversion structure and continue on in the historic flow path.

2. Store ± 45 acre feet of runoff from the West Branch of Llagas Creek in ± 2.5 foot freeboard of the proposed ± 17 acre Lion's Gate Reserve lake/detention system.

3. The result of the proposed detention will be to reduce the existing 100-year peak flow rate as it exits the Lion's Gate Reserve site from ± 800 cfs to ± 400 cfs. This will reduce 100-year runoff peak flows to approximately the 10-year runoff condition which is a substantial reduction and significantly reduce downstream flooding problems.
4. The lake/detention area will be excavated and a normal lake water surface maintained at elevation 273.0. The flood waters will be conveyed by the proposed lake/stream/channel system along Turlock Avenue. The lake/detention system will store the runoff up to elevations 275.5 at which point the inlet stream/channel will back-up and not allow additional runoff to enter the lake system; thus forcing flows in excess of the 100-year event down the Llagas Creek.

2. On-site Drainage

The on-site drainage improvements include the following elements:

1. Routing of urban runoff to detention/retention or lake areas prior to any discharge to the West Branch of Llagas Creek. The on-site drainage system will include roadway catch basin collection system and discharge to drywells at the lake perimeter prior to overflow to the lake system.

2. Individual lot drainage, as part of the master drainage plan, will be prepared to minimize any cross lot drainage to adjacent lots and to determine detailed on-site drainage system requirements.

3. Riparian Area Avoidance and Enhancement

The proposed drainage plan will minimize impacts to the existing waters of the U.S. surrounding Riparian Areas. The proposed lake/detention basin will be utilized to provide additional riparian and open water areas.

4. Master Drainage Plan

A master drainage plan for the Lion's Gate project will be prepared in accordance with the proposed project plans. The master drainage plan will include the following elements:

A. Hydrologic modeling, for pre and post developed conditions, (HEC-1 for the off-site drainage area and rational method for the on-site drainage areas) for determination of rainfall runoff peak flow rates, runoff volumes and time of concentrations for various storm frequencies (2, 10, 50 and 100 year events).

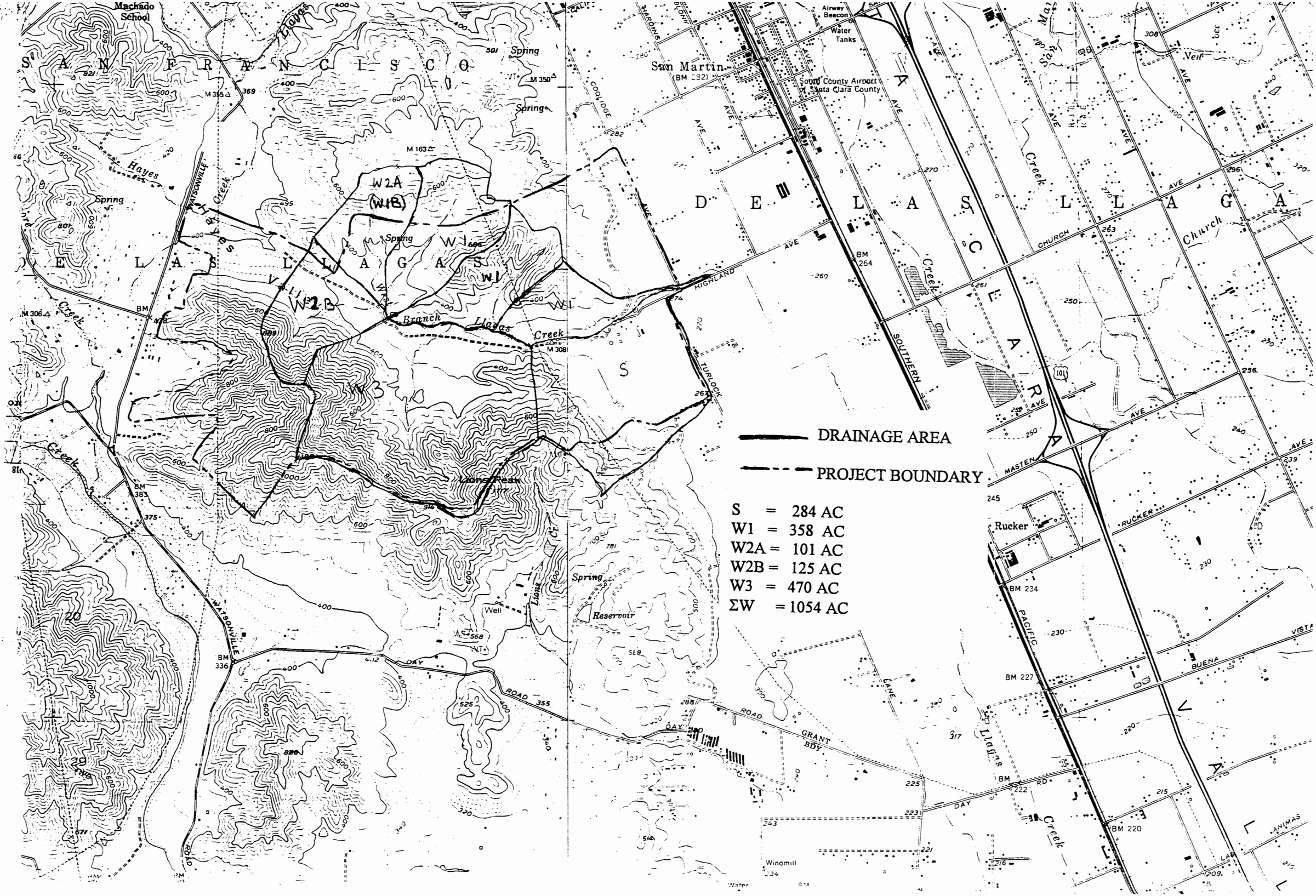
B. West Branch Llagas Creek hydraulic modeling HEC-1 and HEC-2 for determination of existing and proposed condition creek water surface profiles and proposed detention basin routings.

C. On-site and off-site drainage plan which coordinates with the project site plan regarding runoff routing and sizing of storm culverts and other hydraulic features.

The master drainage plan will be submitted to Santa Clara County and the Santa Clara Water District for review and approval.

The preliminary hydrologic analysis prepared in this report is based upon HEC-1 model obtained from the Santa Clara Country Water District and is included in Appendix.

APPENDIX


DRAINAGE AREA
PROJECT BOUNDARY
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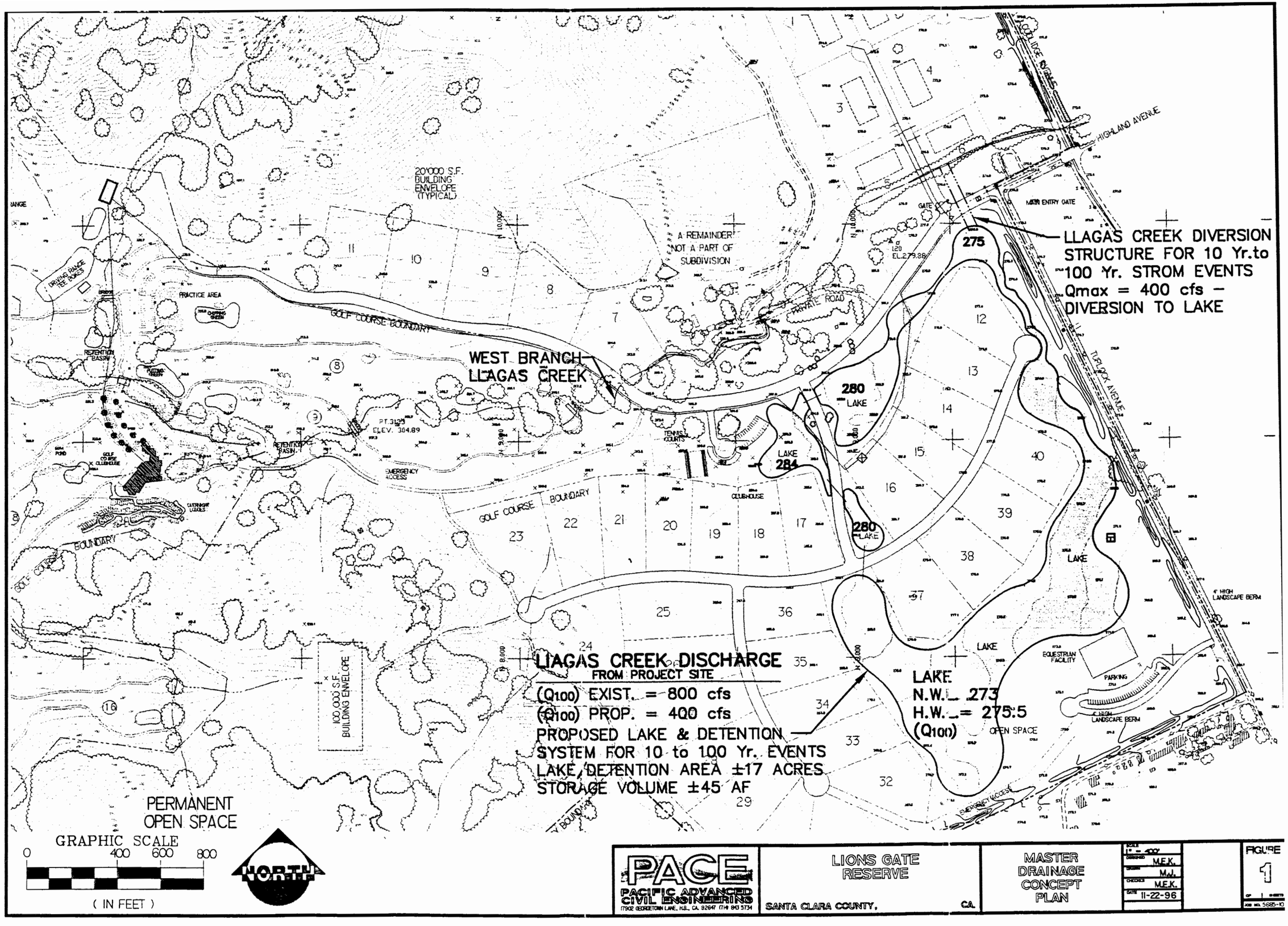
W1 = 358 AC
W2A = 101 AC
W2B = 125 AC
W3 = 470 AC
ΣW = 1054 AC
W2A (W1B)
W2B
W1
W3
Machado School
Hayes
Spring
Watsonville
Creek
Lions Peak
Well
Reservoir
San Martin
(BM 282)
Airway Beacon
Water Tanks
South County Airport of Santa Clara County
Coolidge
Highland
Southern
Pacific
Church
Rucker
Masten
Buena Vista
Day
Road
Grant
Lane
Windmill
BM 383
BM 336
BM 264
BM 227
BM 222
BM 220
M 306
M 355
M 350
M 163
M 308
SANFRANCISCO
DE LAS LLAGAS
SALINAS
VALLEY



PACE
PACIFIC ADVANCED CIVIL ENGINEERING
17902 GEORGETOWN LANE, H.B., CA. 92647 (714) 843 5734

LIONS GATE RESERVE
SANTA CLARA COUNTY, CA.

MASTER DRAINAGE CONCEPT PLAN

SCALE 1" = 400'
DESIGNED M.E.K.
DRAWN M.J.
CHECKED M.E.K.
DATE 11-22-96

FIGURE 1
JOB NO. 5685-10

HEC1 S/N: 1343001791 HMVersion: 6.33 Data File: wbl.dat

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*   U.S. ARMY CORPS OF ENGINEERS        *
*   HYDROLOGIC ENGINEERING CENTER       *
*        609 SECOND STREET              *
*      DAVIS, CALIFORNIA 95616          *
*          (916) 756-1104               *
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:::                                      :::
:::  Full Microcomputer Implementation   :::
:::                 by                   :::
:::        Haestad Methods, Inc.         :::
:::                                      :::
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37 Brookside Road * Waterbury, Connecticut 06708 * (203) 755-1666

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

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    1     ID  WEST BRANCH LLAGAS CR. - 100YR FLOOD  File-WBL.dat
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    3     ID  LOSS RATES OF RURAL PARTS ARE BASED ON MATCHING REGIONAL PEAKS & VOLUMES.
    4     IT      30       0       0     101
    5     IO       5       0

    6     KK     201
    7     KM  UPPER W.B.LLAGAS @ HIGHLAND (LGN1 @ 201).
    8     BA    3.62    0.00    0.00
    9     PB    8.00
   10     PI   0.780  0.8300  1.1900  1.2300  1.0200  1.0800  1.7700  1.6200  2.2300  1.8600
   11     PI   1.440  2.2700  1.6800  1.5500  2.0500  1.6600  1.7400  2.1300  1.7700  1.6200
   12     PI   1.600  1.7900  1.8400  1.8700  1.8800  1.9900  2.6600  2.9800  1.9000  2.2900
   13     PI   3.380  3.2300  2.8700  3.4500  6.0000  5.7700  2.2100  2.4600  2.3600  2.0000
   14     PI   1.930  1.7800  2.0700  1.3200  1.8300  1.7200  1.6300  1.6000  0.0000  0.0000
   15     LU   0.133   0.067   5.000
   16     UC   0.890   1.400
   17     BF   -2.00   -0.01  1.3797

   18     KK     202
   19     KM  ROUTE UPPER W.B.L.  TO  FITZGERALD (202)
   20     RL      0.    0.00
   21     RM       1    0.44    0.00

   22     KK     202
   23     KM  MIDDLE W.B.L. @ FITZGERALD (LGN2 @ 202)
   24     BA    1.77    0.00    0.00
   25     PB    7.74
   26     LU   0.129   0.069   7.000
   27     UC   1.240   0.280
   28     BF   -2.00   -0.01  1.3797

   29     KK     202
   30     KM  TOTAL W.B.LLAGAS @ FITZGERALD (LGN1+2 @ 202).
   31     HC       2

   32     KK      20
   33     KM  ROUTE (LGN1+2)TO MOREY CHAN. CONF. @ 20
   34     RL      0.    0.00
   35     RM       1    0.61    0.00

   36     KK      20
   37     KM  LOWER W.B.L. @   MOREY (LGN3 @ 20)
   38     BA    1.48    0.00    0.00
   39     PB    7.52
   40     LU   0.125   0.063  41.000
   41     UC   1.240   0.170
   42     BF   -2.00   -0.01  1.3797

   43     KK      20
   44     KM  TOTAL W.B.LLAGAS CREEK U/S LIONS (LGN1+2+3 @ 20)
   45     HC       2
```

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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  46      KK      19
  47      KM  LIONS CR. U/S MOREY (LG01 @ 19)
  48      BA    2.09     0.00     0.00
  49      PB    8.04
  50      LU   0.134    0.067    9.000
  51      UC   0.870    0.640
  52      BF   -2.00    -0.01   1.3797

  53      KK      19
  54      KM  NORTH MOREY U/S MOREY(LG02@ 19)
  55      BA    1.02     0.00     0.00
  56      PB    7.68
  57      LU   0.128    0.064   41.000
  58      UC   1.150    0.180
  59      BF   -2.00    -0.01   1.3797

  60      KK      19
  61      KM  MOREY CHANNEL U/S N MOREY CONFL. (LG03 @ 19)
  62      BA    0.76     0.00     0.00
  63      PB    7.46
  64      LU   0.124    0.062   50.000
  65      UC   0.500    0.160
  66      BF   -2.00    -0.01   1.3797

  67      KK      19
  68      KM  MOREY CHANNE D/S N.MOREY (LG02+3 @ 19)
  69      HC       2

  70      KK      19
  71      KM  LIONS CREEK D/S MOREY CHANNEL. (LG01+2+3)@ 19.
  72      HC       2

  73      KK      20
  74      KM  ROUTE LIONS TO W.B.L. CONFL.
  75      RL       0.    0.00
  76      RM       1    0.17     0.00

  77      KK      20
  78      KM  LG04
  79      BA    0.25     0.00     0.00
  80      PB    7.35
  81      LU   0.123    0.061   52.000
  82      UC   0.470    0.160
  83      BF   -2.00    -0.01   1.3797

  84      KK      20
  85      KM  LIONS CR. U/S W.B.LLAGAS.(LG01+2+3+4)@ 20
  86      HC       2
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LINE      ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

  87      KK      20
  88      KM  W.B.LLAGAS D/S LIONS CR @ 20.
  89      HC       2

  90      KK      21
  91      KM  ROUTE W.B.LLAGAS TO MILLER SLOUGH CONF. @ 21
  92      RL       0.    0.00
  93      RM       1    0.75    0.00

  94      KK      21
  95      KM  AREA TRIB. TO RONAN CHANNEL (LGQ1 @ 21)
  96      BA    2.14    0.00    0.00
  97      PB    7.01
  98      LU   0.117   0.058  31.000
  99      UC   1.730   0.180
 100      BF   -2.00   -0.01  1.3797

 101      KK      21
 102      KM  W.B.LLAGAS U/S MILLER SLOUGH @  21
 103      HC       2

 104      KK      21
 105      KM  MILLER SLOUGH U/S W.B.LLAGAS(LGP1 @ 21)
 106      BA    1.83    0.00    0.00
 107      PB    7.12
 108      LU   0.119   0.059  62.000
 109      UC   2.020   0.180
 110      BF   -2.00   -0.01  1.3797

 111      KK      21
 112      KM  W.B.LLAGAS D/S MILLER SLOUGH
 113      HC       2

 114      KK      18
 115      KM  ROUTE W.B.LLAGAS TO MAIN LLAGAS CR.
 116      RL       0.    0.00
 117      RM       1    0.31    0.00

 118      KK      18
 119      KM  AREA TRIB. TO W.B.LLAGAS(LGQ2 @ 18)
 120      BA    2.84    0.00    0.00
 121      PB    6.66
 122      LU   0.111   0.056   9.000
 123      UC   2.350   0.200
 124      BF   -2.00   -0.01  1.3797

 125      KK      18
 126      KM  TOTAL W.B.LLAGAS U/S LLAGAS CR. @ 18 (INCLUDES LGQ2).
 127      HC       2
 128      ZZ
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*        609 SECOND STREET              *
*      DAVIS, CALIFORNIA 95616          *
*          (916) 756-1104               *
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WEST BRANCH LLAGAS CR. - 100YR FLOOD File-WBL.dat
RAINFALL DISTRIBUTION IS BASED ON C.O.E. STANDARD STORM.
LOSS RATES OF RURAL PARTS ARE BASED ON MATCHING REGIONAL PEAKS & VOLUMES.

5 IO OUTPUT CONTROL VARIABLES

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IPLOT	0	PLOT CONTROL
QSCAL	0.	HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA

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IDATE	1	0	STARTING DATE
ITIME		0000	STARTING TIME
NQ		101	NUMBER OF HYDROGRAPH ORDINATES
NDDATE	3	0	ENDING DATE
NDTIME		0200	ENDING TIME
ICENT		19	CENTURY MARK

COMPUTATION INTERVAL 0.50 HOURS
TOTAL TIME BASE 50.00 HOURS

ENGLISH UNITS

DRAINAGE AREA	SQUARE MILES
PRECIPITATION DEPTH	INCHES
LENGTH, ELEVATION	FEET
FLOW	CUBIC FEET PER SECOND
STORAGE VOLUME	ACRE-FEET
SURFACE AREA	ACRES
TEMPERATURE	DEGREES FAHRENHEIT

*** WARNING ***** POSSIBLE INSTABILITIES IN THE MUSKINGUM ROUTING FOR REACH 20.
REDUCE NSTPS OR DECREASE YOUR COMPUTATION INTERVAL (FIRST FIELD OF THE IT RECORD).

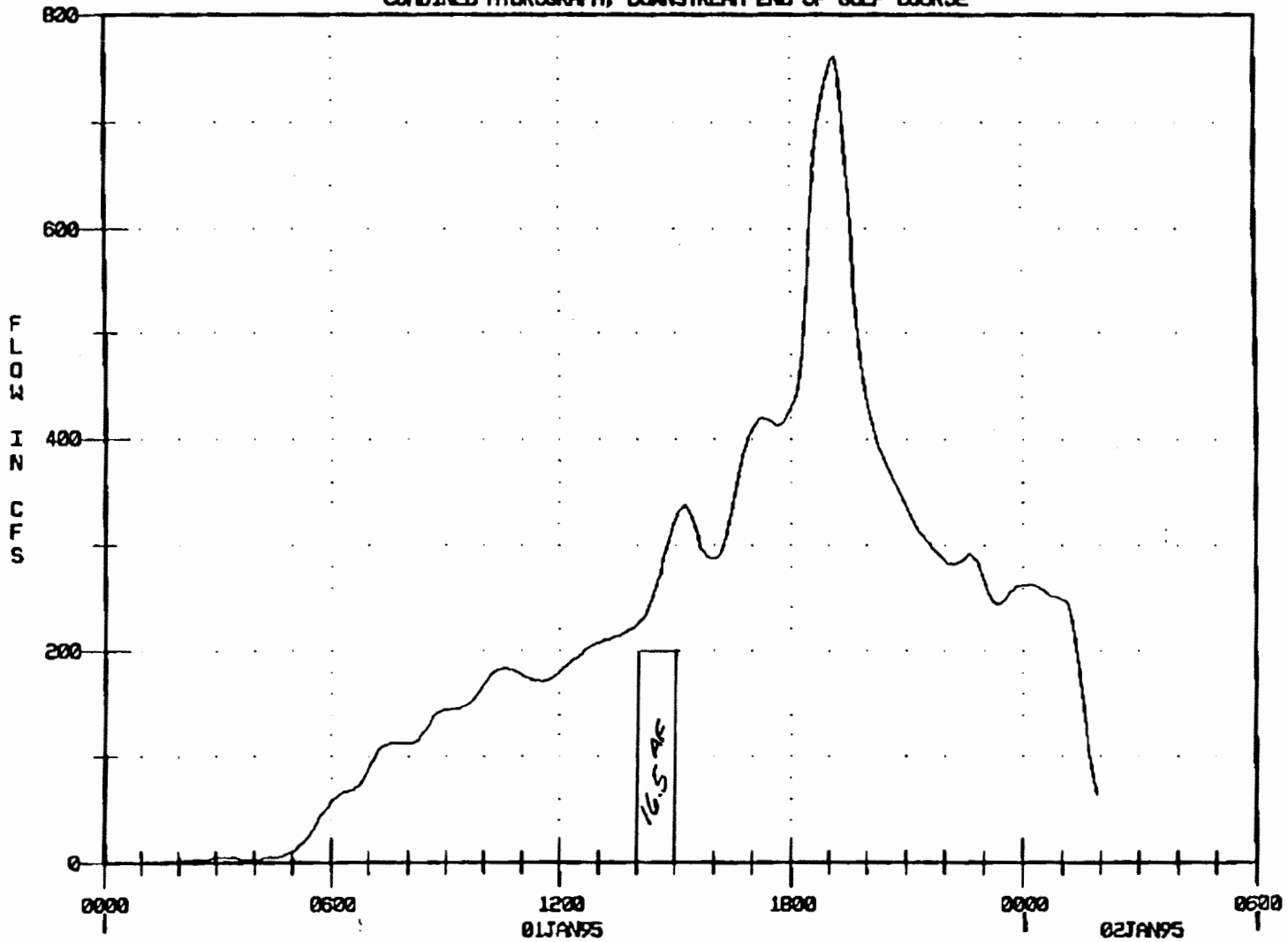
RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	201	1404.	18.50	1011.	611.	299.	3.62		
ROUTED TO	202	1326.	19.00	1006.	611.	299.	3.62		
HYDROGRAPH AT	202	818.	18.50	498.	291.	140.	1.77		
2 COMBINED AT	202	2108.	18.50	1485.	898.	440.	5.39		
ROUTED TO	20	1931.	19.00	1475.	896.	440.	5.39		
HYDROGRAPH AT	20	692.	18.50	430.	261.	127.	1.48		
2 COMBINED AT	20	2518.	18.50	1884.	1152.	566.	6.87		
HYDROGRAPH AT	19	936.	18.50	611.	363.	176.	2.09		
HYDROGRAPH AT	19	490.	18.00	303.	184.	89.	1.02		
HYDROGRAPH AT	19	416.	18.00	223.	136.	66.	0.76		
2 COMBINED AT	19	906.	18.00	525.	320.	155.	1.78		
2 COMBINED AT	19	1832.	18.00	1135.	683.	331.	3.87		
ROUTED TO	20	1781.	18.50	1133.	683.	331.	3.87		
HYDROGRAPH AT	20	135.	18.00	72.	44.	21.	0.25		
2 COMBINED AT	20	1871.	18.50	1205.	727.	353.	4.12		
2 COMBINED AT	20	4389.	18.50	3061.	1873.	919.	10.99		
ROUTED TO	21	3928.	19.00	3033.	1865.	919.	10.99		
HYDROGRAPH AT	21	896.	18.50	571.	344.	167.	2.14		
2 COMBINED AT	21	4703.	19.00	3578.	2204.	1086.	13.13		
HYDROGRAPH AT	21	760.	18.50	516.	320.	156.	1.83		
2 COMBINED AT	21	5424.	19.00	4081.	2522.	1242.	14.96		
ROUTED TO	18	5360.	19.00	4076.	2519.	1242.	14.96		
HYDROGRAPH AT	18	988.	19.00	693.	410.	198.	2.84		
2 COMBINED AT	18	6348.	19.00	4748.	2927.	1440.	17.80		

*** NORMAL END OF HEC-1 ***

08DEC95 15:10:08

COMBINED HYDROGRAPH, DOWNSTREAM END OF GOLF COURSE



100-YEAR W/PROJECT FLOW (1W3C)

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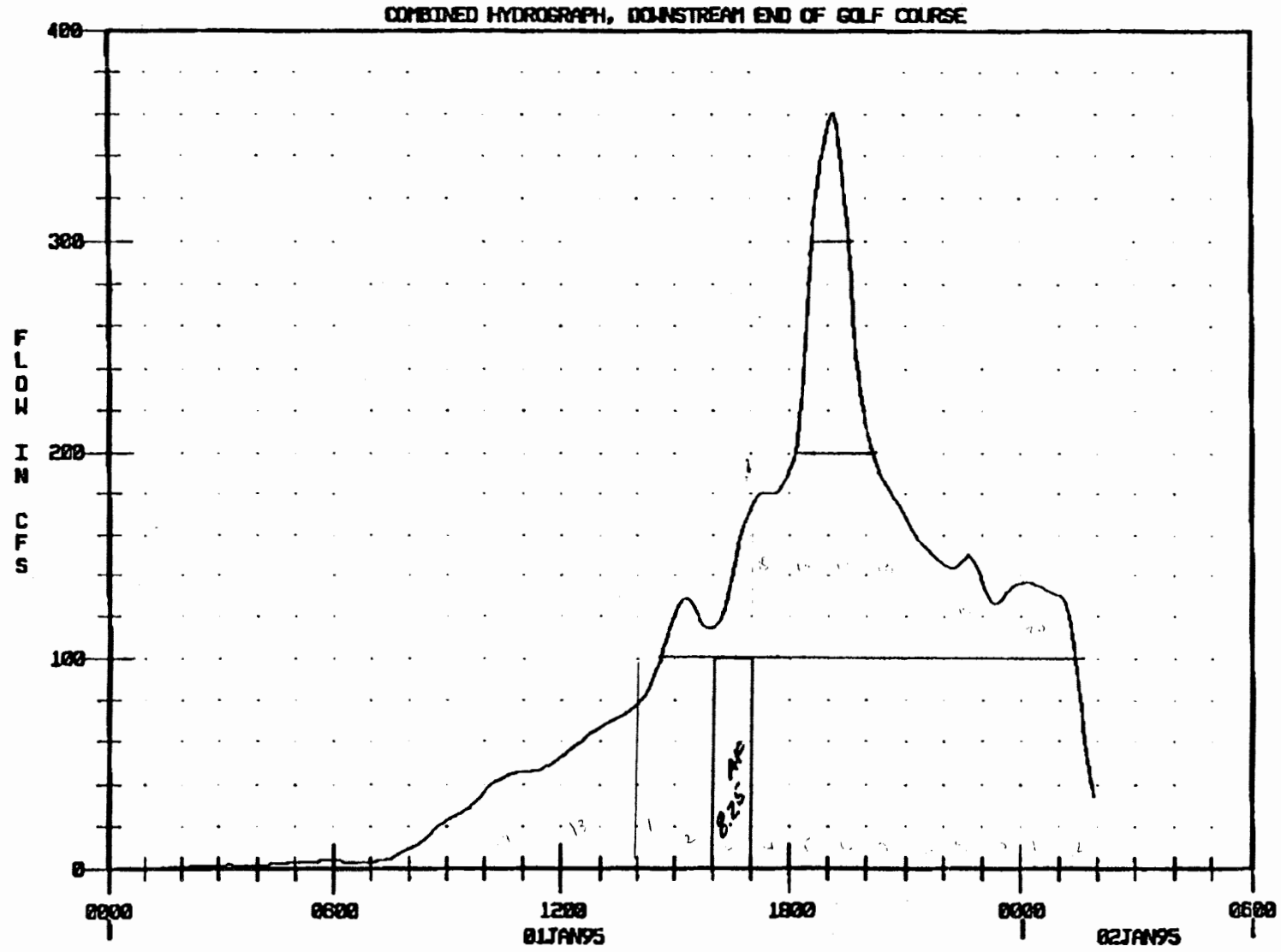


10-YEAR W/PROJECT FLOW (1W3C)

Appendix N

Wastewater System Preliminary Design Report

Prepared By

Pacific Advanced Civil Engineering

December 1996

PRELIMINARY DESIGN REPORT

for the

LION'S GATE RESERVE

WASTEWATER SYSTEM

Prepared By:

Pacific Advanced Civil Engineering
17902 Georgetown Lane
Huntington Beach, CA 92647

December 2, 1996

#6785

PRELIMINARY DESIGN REPORT
for the
LION'S GATE RESERVE PROJECT

WASTEWATER SYSTEM

I. INTRODUCTION

The proposed Lion's Gate Reserve, San Martin, CA consists of 1676 acres in the Hayes Valley, approximately 1 mile west of the rural community of San Martin. The project development concept consists of a golf course and lakes, clubhouse, lodges, 41 estate homesites, and other open space. The proposed method of sewage treatment is by gravity collection to an onsite wastewater treatment/reclamation plant.

II. WASTEWATER COLLECTION, TREATMENT AND DISPOSAL

System Description

The entire project can be sewered by gravity flow of all sewage (not just effluent as previously proposed) to an advanced treatment plant (see attached Figure 1). The sewer collection system will pass through a grit screen and empty into a wet well at the treatment plant. Lift pumps will be used to lift the influent to the SBR tank. The proposed treatment method will utilize the Sequential Batch Reactor (SBR) process, combined with disinfection and final (tertiary) treatment occurring at a constructed wetland area. Discharge of treated effluent will pass from the SBR tank, through a disinfection tank, and flow by gravity out of the disinfection tank through the wetlands polishing cells (please refer to Figure 2). As an alternative to the wetlands polishing system, a rapid sand filtration system will be considered. Finally, treated (oxidized, clarified, disinfected, and polished) effluent will be pumped from the wetlands for use in project landscape buffer irrigation. A storage basin will be provided near the irrigation facilities for storage of reuse water during winter wet weather periods when irrigation reuse is not acceptable.

With the tertiary treatment provided by the system, the effluent will meet Title 22 Reclaimed Water Class II standards (i.e., median 7-day total coliform count less than 2.2/100 ml). This level of treatment **exceeds** the required level of disinfection for its intended use as irrigation water for limited access landscaping (please see Appendix, Table 3.0 - California Code Summary of Title 22 Treatment and Water Quality Requirements). Irrigated areas will be posted with required signage for usage of reclaimed water.

The plant will be owned, operated, and maintained by the Community Services District (CSD).

Plant Site and Building Requirements

The treatment plant site will be located near the southeast corner of the site to take advantage of gravity flow and reduce pumping requirements. Gravity collection to the plant represents substantial savings in both capital costs and ongoing power and maintenance costs over individual pumped septic systems. Regulating agencies, including the Regional Water Quality Control Board, were concerned about the potential for the possible failure of the many individual pumps previously proposed. As shown in the Design Data Section of this report, the effluent water quality produced by the proposed SBR facility substantially exceeds all treatment requirements and specifically reduces nitrate levels well below existing ground water levels (see Appendix for nitrate loading calculations).

The SBR facility, including the disinfection tanks, sludge ponds, and controls, will be housed in a low profile barn-like or residential building. The building will be one story and will only occupy an approximately 40' by 40' footprint. The minimal land coverage, adjacent wetland area, low building profile, and screening provided by a frontage berm along Turlock Avenue all will combine to make the facility inconspicuous.

Treatment Process Description

Basically, the proposed SBR is a one-tank batch treatment process which uses jet aeration and an arrangement of baffles to carry the wastewater through all the processes: biological oxidation, sedimentation, nitrification, and dentrification. These processes occur in a timed sequence during five basic operational modes or periods: (1) fill, (2) react, (3) settle, (4) decant, and (5) idle. Sludge is pumped from the SBR tank to a sludge holding pond, where it is further treated and reduced in volume. Sludge removal from the sludge holding pond will be required infrequently; approximately 3,000 gallons of sludge will be removed every 3 months by tanker truck and taken to an approved municipal treatment facility with sludge processing capabilities. For a detailed description of the SBR Treatment Process, please refer to the information in the Appendix provided by Fluidyne Corp., a leader in the sewage treatment industry.

SBR Conceptual Design Data

Based upon our review of the proposed Lion's Gate Reserve development, and the previously prepared wastewater generation summary table (Table 1.0). We propose a single cell Sequential Batch Reactor (SBR) system with an design flow treatment capacity of 30,000 gallons per day (gpd).

The projected SBR system includes the following elements and design flow rates:

• Bar Screen	50 gpm
• Wetwell Lift Station (2)- 2 hp pumps	50 gpm
• 16' x 48 x 17' SBR Treatment Tank (1) 5 hp jet pump, (2) 5 hp blowers	30,000 gpd
• 16' x 24' x 12' Disinfection Tank	30,000 gal
• Sludge Digester/Emergency Storage Reservoir	40,000 gal
• Effluent Discharge Pump station	275 gpm
• Wet Weather Effluent Storage	6.4 ac-ft

The proposed SBR treatment system will provide an advanced level of treatment to provide high quality of effluent suitable for reuse for all types of irrigation. The preliminary design parameters for the SBR as listed below will exceed the established reuse requirements.

Criteria	Influent Design Data	SBR Treated Effluent Quality	% Removed	Typical Treatment Requirements
Flow Average Day gpd)	25,000	25,000	-	-
Flow Max. Day (gpd)	50,000	50,000	-	-
BOD (mg/l)	300	<5	>95	<30
TSS (mg/l)	250	<5	>95	<30
TN (mg/1)	40	<2	>90	<10

It is evident that the SBR treatment process exceeds typical treatment quality requirements. The high level of nitrate removal is notable and especially important to this site because of the existing groundwater contamination. And, with proper calibration, operation, and maintenance of the SBR system, the above treatment performance can be exceeded.

Disinfection

Effluent discharged from the SBR during the decant cycle will pass through the disinfection tank. The disinfection tank will provide approximately 6 hours of contact time prior to discharge to the wetlands treatment cell. Disinfection will be accomplished by either UV, or ozone methods. Preliminary feasibility analysis suggests that the disinfection method may be a combination of ozone (O2-O3 aeration) and ultraviolet disinfection as required. Disinfection goals are to meet the requirements for total coliform count < 2.2/100 ml. With the use of ozone and/or UV disinfection systems there will be no creation of toxic THM's or other chlorine by/products, thus eliminating any need for dechlorination.

Effluent Polishing - Freewater Surface Wetland Treatment System

The effluent from the SBR disinfection system will flow by gravity through a polishing cell, where bio-filtration and wetlands biological dentrification occurs. The system will consist of a lined area with freewater surface treatment wetlands and irrigation storage. The wetlands treatment cell will be approximately 0.5 to 0.75 acres in size and approximately 2 feet deep. The wetlands will provide a five day treatment retention time (at average effluent discharge rates) prior to discharge into the storage reservoir portion of the wetlands.

The wetlands are for polishing of the effluent only, and are not relied upon to meet the SBR treatment goals. The constructed wetlands will be planted with effective wetland plants to polish, filter, and treat the water through a variety of biological, chemical, and physical processes. Wetlands have proven especially effective for the reduction of nutrient levels (Gerald Moshiri, Ph.D. et al., 1993). The wetland plants will be selected based on indigence, local availability, treatment system functionality, and aesthetics. Thus, the wetlands will have a natural, aesthetically pleasing appearance and will appear to be part of the natural treatment system.

Title 22 Compliance for Effluent Reuse:

The treated effluent from the SBR in the wetlands area will be monitored to meet Title 22 requirements for irrigation reuse (Appendix, Table 3.0 - "California Code Summary of Title 22 Treatment and Water Quality Requirements"). The water will be disinfected to the coliform count of < 2.2/100 ml (Class 2), which exceeds the requirement for limited access landscape irrigation.

The project effluent will be used for irrigation of the project landscape buffer and equestrian grazing area along the east and south-east of the project. The effluent irrigation area requires a maximum area of 8 acres based upon winter irrigation rates.

III. OPERATIONAL ISSUES

Reliability: Extensive reliability measures have been incorporated into the treatment plant design. The wet well will provide a safety margin of storage volume for primary effluent storage.

Emergency storage will be provided by the sludge/containment pond and the lined wetland pond. California Title 22 Code, Division 4 requires that "where short term storage retention or disposal provisions are used as a reliability feature, these shall consist of facilities reserved for... storing or disposing of ...wastewater for at least a 24-hour period." The sludge pond, with 40,000 gallon capacity, will provide 24-hour emergency storage for untreated wastewater and act as a standby primary and sedimentation unit process facility. As an additional reliability measure for an extreme emergency, the treatment facility will have the ability to store untreated wastewater in the lined wetlands area, thus providing a 20-day emergency storage volume.

The treatment plant effluent disposal reliability, in addition to the site irrigation, is further provided by the ability to store effluent for over 120 days during wet weather months in an adjacent storage area. The equivalent 120-day winter effluent volume of approximately 6.4 acre-feet can be held in an approximately 1.75 acre containment area adjacent to the landscape buffer which will utilize the effluent. The normally dry storage area shall be lined with either clay or PVC depending upon soil suitability; the liner will be backfilled with a minimum of 18 inches of soil and landscaped to blend with the surrounding area.

Potential Flooding: Neither the SBR facility/building or the wetlands will be susceptible to flooding during a major storm event, since the entire lined wetland area and the SBR facility will be elevated above the 100-year storm event. The adjacent lake will be constructed with sufficient berming to prevent inundation outside the lake during the 100-year storm event. Current proposed flood control improvements and site grading will significantly reduce this flooding (please refer to Lion's Gate Master Drainage Report). However, in the absence of such improvements, the facilities will all be constructed on pads above the 100-year flood elevation.

Back-up Power Supply: A back-up power supply in the form of a portable or in-place diesel/propane (respectively) generator will be provided in the event of an extended power failure. The back-up generator shall be sized to provide a minimum of 480 VAC, 60 kW.

Solids Disposal: Plant headworks screenings shall be collected from the bar screen and stored in rubbish containers and disposed of properly in a sanitary landfill. The sludge removed from the SBR cell will be processed in the sludge digester basin and thickened. It is estimated that approximately 3,000 gallons of liquid sludge will be removed from the sludge digester every 3 months of operation. The liquid sludge will be transported in tanker trucks to a nearby large scale municipal treatment facility for sludge processing and disposal. Sludge processing is an ongoing process at large scale facilities with belt presses and/or sludge drying beds. The transported sludge is highly aerated and easily introduced into the processing system. In contrast to the sludge hauling, the previously proposed system of septic tanks would require hauling of septage to nearby treatment facilities. Septage is in an anaerobic condition and is not compatible for easy disposal in most activated oxygen type treatment facilities. The facilities have to introduce the septage slowly, so as not to upset the balance in the treatment system bio-mass. Overall, disposal of sludge is preferable to septic tank's solid waste.

Earthquake Safety: The treatment facility will be designed and constructed so that, in the event of a major catastrophe such as an earthquake, spill of untreated sewage would only occur into lined, contained areas (e.g., the wetlands). In addition, the treatment system tanks are mostly below ground level, thus minimizing the risk of a spill.

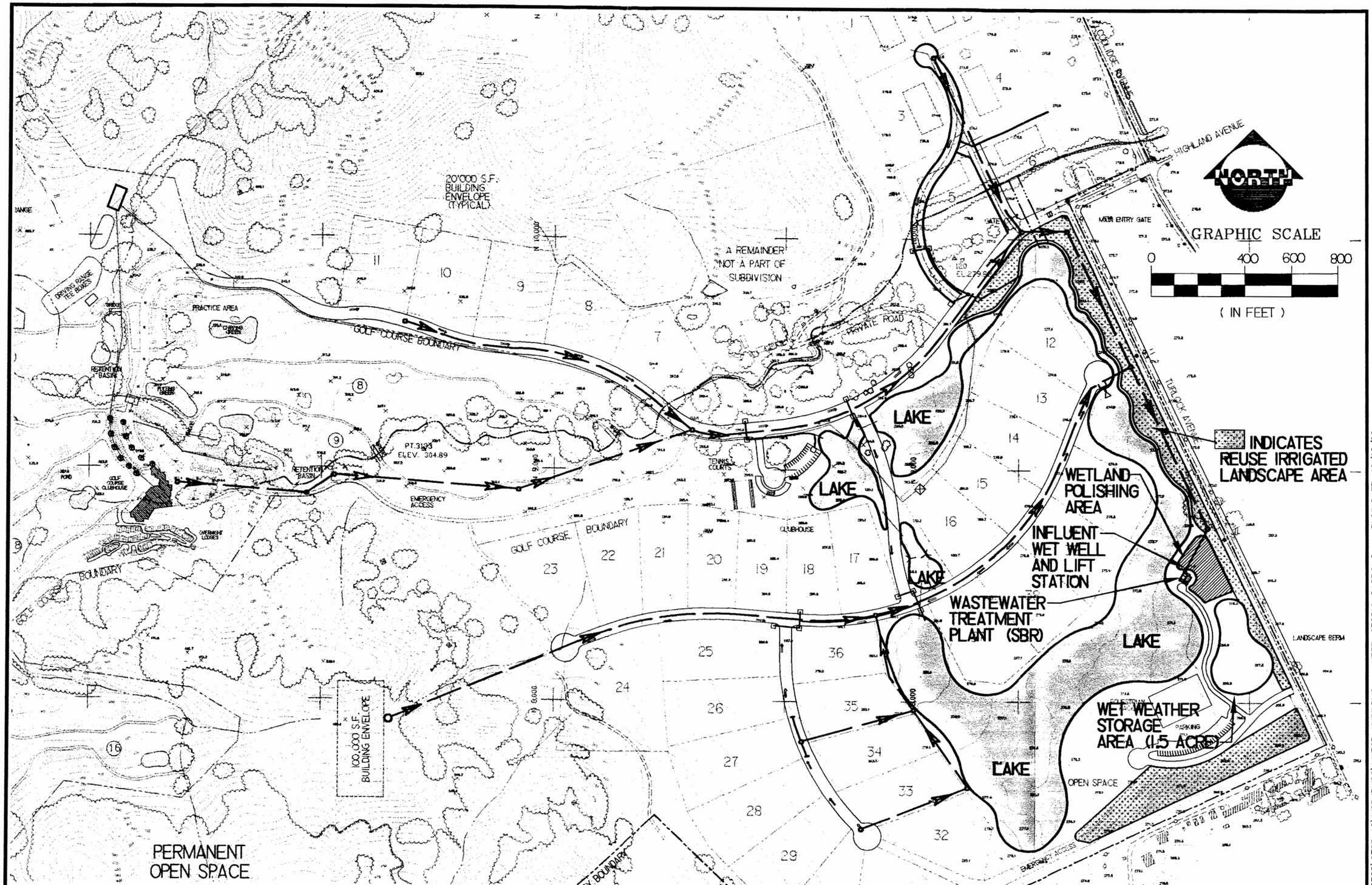
Operations and Maintenance: The plant will be operated by a certified operator as required by the Regional Water Quality Board. It is assumed that the CSD will contract with an operations individual or company to operate and maintain the facility. Testing and regularly scheduled maintenance should require less than 20 hours per week for a well trained individual with maintenance help as required. The SBR equipment manufacturer will provide a detailed operation and maintenance manual including regularly scheduled maintenance items such as dissolved oxygen sensor calibration, etc.

Testing and Water Quality: The licensed plant operator will provide an approved laboratory with water samples for testing as required by the Title 22 standards.

Environmental Issues:

Nitrates: The groundwater nitrate levels is a significant environmental issue. The SBR treatment combined with wetlands polishing will optimize nitrate removal levels. As previously stated, all previous EIR recommendations for groundwater quality assurance should be followed. As previously required, a provision for a downstream groundwater monitoring well should be included.

Odors: The SBR treatment process utilizes a significant amount of aeration and the treatment process occurs below water level the potential for odors is minimal. Also, the sludge is in an aerated liquid state while on site and when removed from sludge disposal, thereby reducing the potential for odor concerns. The entire treatment facility will be enclosed in a structure to further eliminate the potential for odor dispersion. This method has been used successfully at the Hollister, California wastewater treatment plant (see enclosed photo in Appendix). The Hollister facility is completely enclosed and located in a residential neighborhood and has no mechanical air scrubber system or odor problem.



LEGEND

— → — GRAVITY SEWER

PACE
PACIFIC ADVANCED CIVIL ENGINEERING
17302 GEORGETOWN LANE, H.B., CA. 92647 (714) 843-5734

LIONS GATE
GILROY, CALIF.

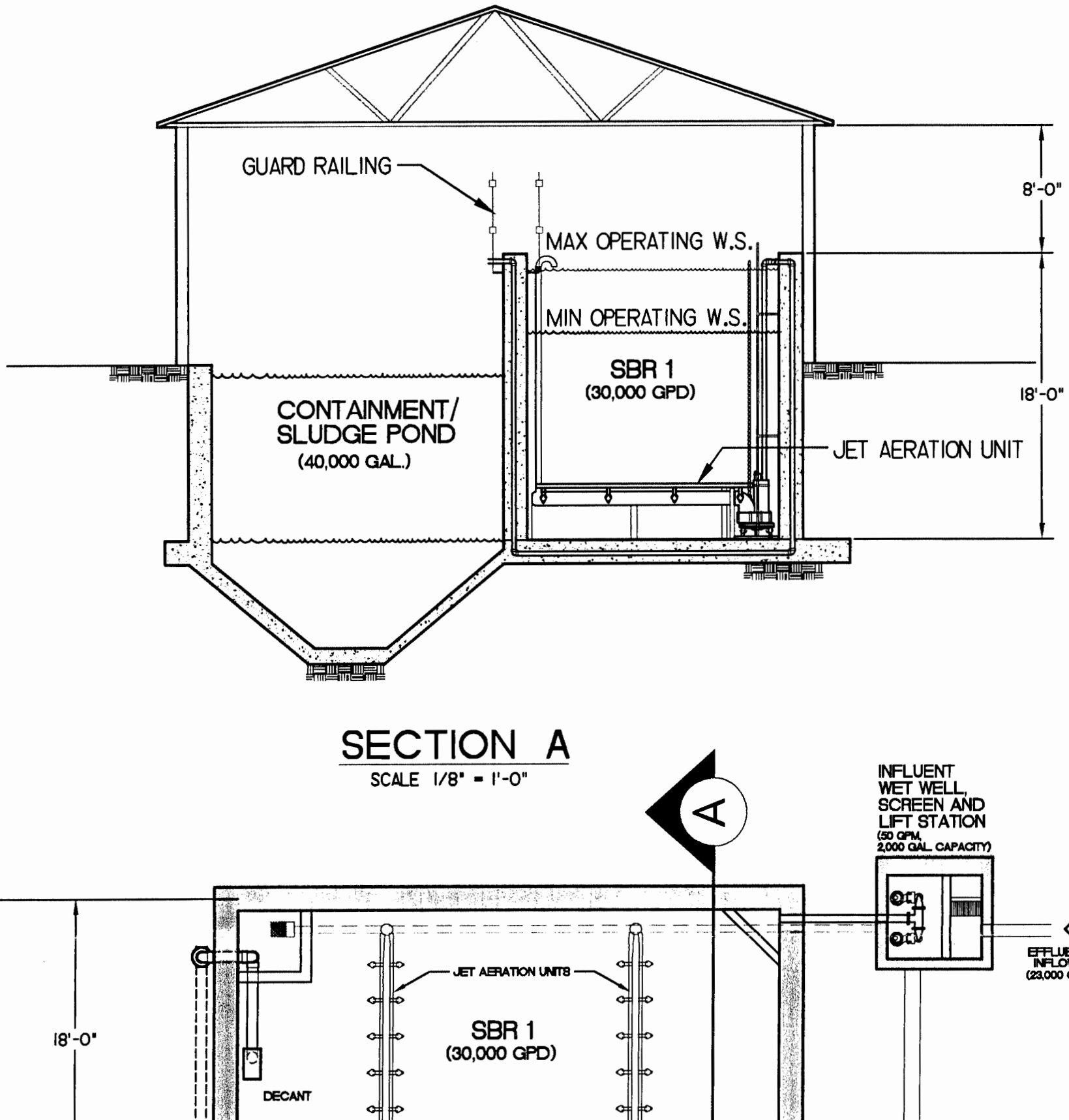
WASTEWATER FACILITIES CONCEPT PLAN

SCALE 1" = 400'
DESIGNED W.P.R.
DRAWN M.J.
CHECKED W.P.R.
DATE 12-09-96

FIGURE 1

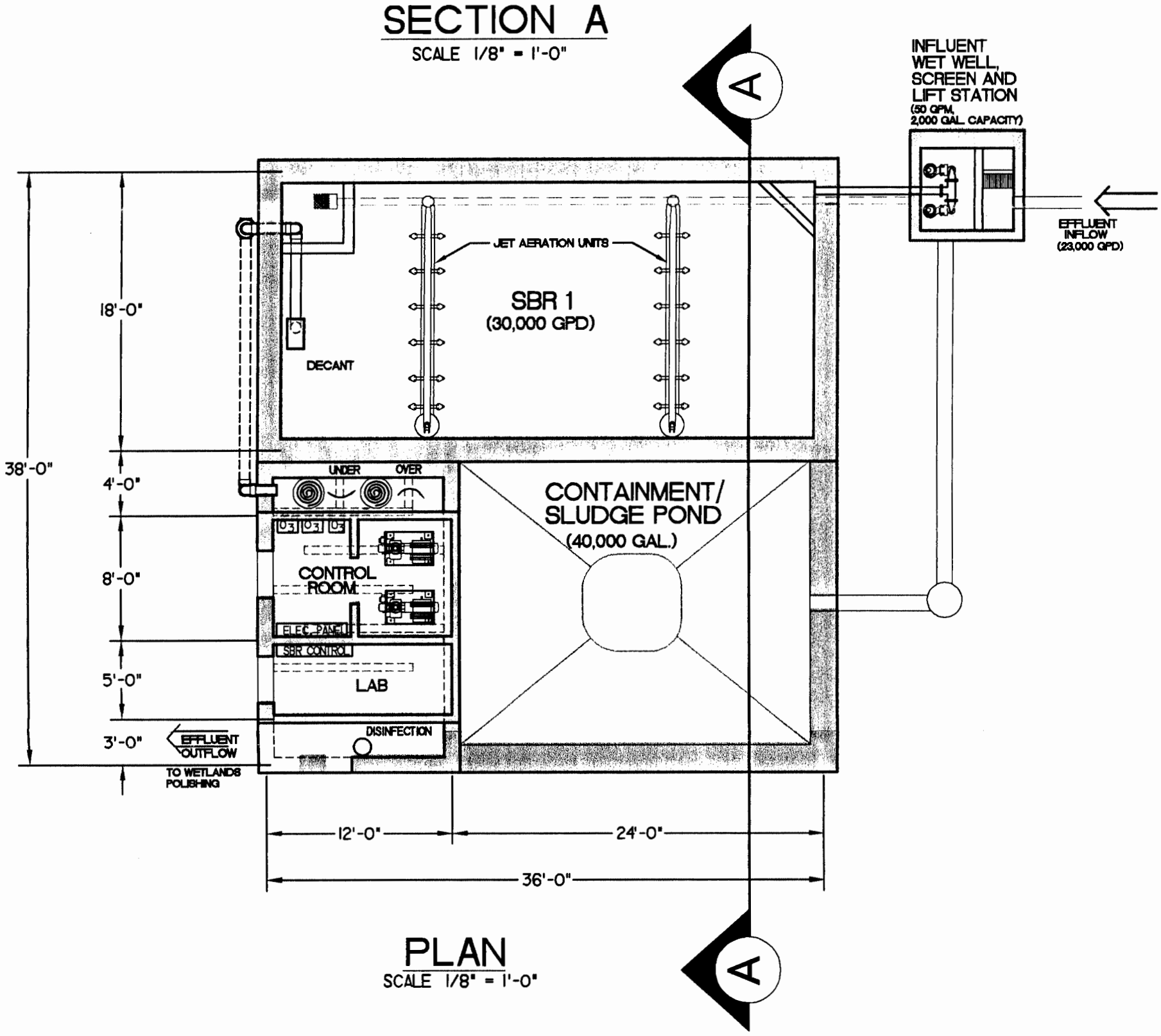
JOB NO. 6785-10

PATH O:\1996\6785\6785-10\WORKDWGS\WWFCP-XHBT.DWG XREF: 678510-BASE.DWG PLOT DATE: 12/09/96



SECTION A

SCALE 1/8" = 1'-0"



PLAN

SCALE 1/8" = 1'-0"

TITLE: SEQUENCING BATCH REACTOR SCHEMATIC SANTA CLARA COUNTY CALIF.	JOB: LION'S GATE RESERVE	SCALE: 1/8" = 1'-0" DRAWN: M.J. CHKD: W.P.R. DATE: 12-05-96 JOB No. 6785-10	PACE PACIFIC ADVANCED CIVIL ENGINEERING 17902 GEORGETOWN LANE HB, CA. 92647 (714) 843-5734 FAX 848-4820	2 FIGURE

PATH = O:\6785\6785-10\WORKDWGS\678510-SBR.DWG PLOT DATE 12/05/96

APPENDIX

- Table 1.0 - Wastewater Generation Data
- Table 2.0 - Advantages of SBR Wastewater Treatment Systems
- Table 3.0 - California Title 22 Code Summary
- Nitrate Loading Calculations
- Fluidyne SBR Treatment System Information

Table 1.0
Wastewater Generation Data

NOTE: TEXT AND TABLE TAKEN FROM LION'S GATE RESERVE EIR APPENDIX M "WASTEWATER FEASIBILITY STUDY FOR LION'S GATE RESERVE SANTA CLARA COUNTY, CALIFORNIA" BY QUESTA ENGINEERING CORPORATION DECEMBER 1995.

The total estimated wastewater flows are summarized in Table 17. Based on the above generation rates, the total wastewater flow for the Lion's Gate project is estimated to be approximately 23,000 gpd. This includes a contingency of approximately 5 percent to account for uncertainties about the specific details of project facilities that would not be determined until the design stage. Final wastewater facility design would also need to anticipate and provide for peak flow conditions which, on a daily basis, may be in order of 25 to 30 percent higher than the average daily flow. For the proposed project this translates to a peak system flow estimate of about 30,000 gpd.**

TABLE 17
ESTIMATED WASTEWATER FLOWS*

Residences	41 houses	250 gpd	10,250
Golf Course Clubhouse • Restaurant	200 meals	10 gal/meal	2,000
• Golfers	200	5 gpd	1,000
• Restroom	20	25 gpd	500
• Showers	30	15 gpd	450
• Employees			
Overnight Units	45 rooms	150 gpd	6,750
Practice Range	50 golfers	3 gpd	150
Equestrian Center	25 visitors	10 gpd	250
Subtotal			22,000
Contingency			1,000
Total Project			23,000

*This does not include the wastewater flows for the golf course maintenance building (approximately 300 gpd) which would be served by an individual septic system.

**Note: System design hydraulic capacity of 2 x average day.

Table 2.0
Advantages of Fluidyne SBR Wastewater Treatment System

The U.S. Environmental Protection Agency (EPA) has published reports Regarding Sequencing Batch Reactions (SBR's) stating the following treatment system highlights.

1. SBR's provide advanced level treatment and can meet varied and stringent water quality objectives (i.e. peak shaving, nitrate and phosphorous removal, etc.) by simply changing operational strategies or reprogramming the plant software. This is in contrast to conventional plants which would require major expenditures of capital to build larger facilities for advanced treatment.

2. Inherent to the SBR design is it's ability to provide equalization of both flow and quality, and SBR's are generally free from surges, short circuiting and other problems typically seen in conventional plants.

3. SBR plants are reported simpler to operate than conventional plants by a ratio of about 2:1.
   - SBR's require less equipment
   - SBR's require less capital cost
   - SBR's have lower maintenance, labor and material cost.
   - SBR's use less power to operate
   - SBR's total operating cost is lower
   - SBR's are fully automated
   - SBR's seldom require repairs. If necessary, however, repairs can usually be accomplished without any plant down time.

4. In several cases SBR's were constructed instead of continuous flow plants because of the large savings in capitol costs. Savings were important since several plants were 100% privately funded. The cost of a SBR system is about one-half of the cost of a conventional system of similar treatment ability and capacity.

5. Minimal operation complexity along with minimal maintenance time is required for SBR system operation (the 1.0 MGD EPA funded plant in Idaho Springs, Colorado, requires an operator only for about 2 days per week).

6. The total area space required for a SBR is significantly less than for a conventional system.

7. With the SBR design odor is virtually non-existent and plant effluent water quality can be maintained at drinking water standards, including very low nutrient levels which may be the most important factor for discharge and reuse/recharge.

8. The SBR design includes minimal open water areas, thus minimizing effluent evaporation and other losses and maximizes the available effluent for reuse. All water is a resource and the SBR technology conserves it and provides the highest quality treatment available.

9. SBR's produce higher quality effluent without addition of chemicals.
   - SBR's have easier settling floc without the addition of chemicals.
   - SBR's water effluent is so solids-free that it is much easier to filter the effluent if required.

10. SBR's can be programmed to deal with varying degrees of high BOD and suspended solids. SBR's are much less susceptible to system upsets cased by uneven strengths in the influent flow cycles.

11. SBR's are easily expandable to handle additional capacity.

Table 3.0

CALIFORNIA CODE SUMMARY OF TITLE 22 TREATMENT AND WATER QUALITY REQUIREMENTS

Reclamation Alternative	Treatment and Effluent Quality Requirement*	Reclaimed Water Class
Golf course (with contiguous homes), parks, playgrounds and schoolyard irrigation	Tertiary treatment (oxidation, coagulation, clarification, filtration and disinfection); 7-day median # of coliforms ≤ 2.2 per 100 ml, plus maximum of 23/100 ml. in any one sample.	I
Recreation impoundment (non-restricted access)	Tertiary treatment (oxidation, coagulation, clarification, filtration and disinfection); 7-day median # of coliforms ≤ 2.2 per 100 ml, plus maximum of 23/100 ml in no more than 1 sample in a 30 day period.	I
Agricultural food crops for human consumption #	Secondary to tertiary treatment, (extent of treatment varies depending on type of crop and application)	II or I
Recreation impoundment (restricted access)	Secondary treatment (oxidation and disinfection); total effluent coliform <2.2/100 ml, median 7 day.	II
Landscape impoundment	Secondary treatment (oxidation and disinfection); total effluent coliform <23/100 ml, median 7 day.	III
Pasture for milking animals	Secondary treatment (oxidation and disinfection); total effluent coliform <23/100 ml, median 7 day.	III
Golf course, (without contiguous homes), cemetery, freeway, median, and limited access landscape irrigation	Secondary treatment (oxidation and disinfection); total effluent coliform <23/100 ml, median 7 day, plus maximum of 240/100 ml in any 2 samples.	III
Fodder, fiber and seed crops, orchards and vineyards	Primary treatment (screened).	**

* Total effluent coliform requirements refers to a 7 day median value.

** Title 22, in its current form, allows primary effluent for this type of reuse, but in practice, secondary effluent (Class II) is typically required.

\# Reclaimed water not allowed for some crops, such as rice.

Lion's Gate Project
Nitrate Loading Calculations
for
Wastewater Plus Golf Course Fertilizer

Assumptions

- Golf Course Fertilizer Leached (F): 262 lbs to 1,965 lbs (per Audobon Cooperative Sanctuary System)
- Total Annual Recharge Volume (R): 51.9 million gallons (per Audobon Cooperative Sanctuary System)
- Total Nitrogen (N_2) in Secondary Treated Effluent: 2 mg/l
- Wastewater Nitrogen Reduction Through Pond Storage (P): 40%
- Wastewater Nitrogen Reduction Through Plant Uptake and Soil Dentrification (I): 75%
- Average Wastewater Flow = 23,000 gpd = 8.4 million gallons/year.

Calculations

1. Wastewater Nitrogen Leached (W)

   $W = 8.34 ((N_2) (1 - P) (1 - I) (8.4 \text{ million gallons})$
   $W = (8.34) (2 \text{ mg/l}) (1 - 0.4) (I - 0.75) (8.4)$
   $W = 21 \text{ lbs/year}$

2. Total Combined NO_3 - N Concentration in Recharge Water:

   $$N_c = \frac{W + F}{(8.34)(R)}$$

   $$N_c = \frac{27 + 262}{(8.34)(51.9)}$$

   $N_c =$ 0.65 mg/l NO_3 - N Low Estimate

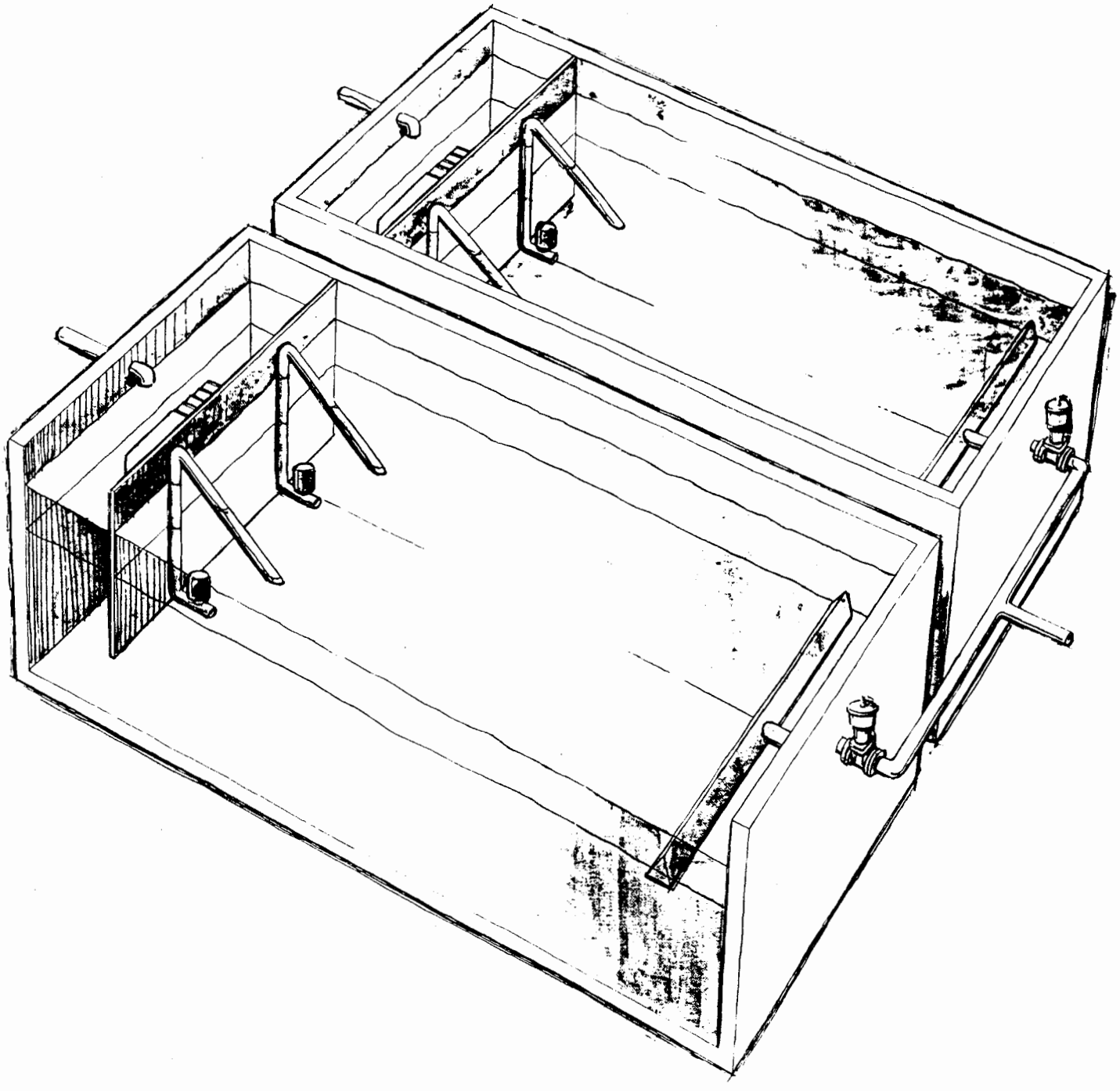
   to

   $$N_c = \frac{21 + 1.965}{(8.34)(51.9)}$$

   $N_c =$ 4.59 mg/l NO_3 - N High Estimate

FLUIDYNE

Sequencing Batch Reactor for economical, reliable, advanced wastewater treatment



FLUIDYNE

A low cost, easily controlled system

Fluidyne's unique Sequencing Batch Reactor (SBR) System answers the need for a reliable yet easily controlled waste water treatment system that fits within limited budgets.

The SBR is particularly suited for systems:

1) with a wide range of inflow and/or organic loadings;
2) requiring minimal operator attention;
3) requiring extremely close control of effluent quality, such as for removal of specific components; and
4) in small to medium size communities and industries such as food processing.

Innovation rooted in proven concepts

Fluidyne's Sequencing Batch Reactor represents an innovation in the field — but the concept of treating wastewater by the batch goes way back. In fact, the original (1914) activated sludge plants **were** batch operations. The switch to the now-conventional continuous flow methodology was largely made to solve mechanical difficulties (diffuser plugging) and reduce the supervision required by the then inadequate batch control systems.

The Fluidyne SBR System gives you the benefits of high quality, low cost batch treatment without the original disadvantages. Aeration is by large-orifice jet mixers (also used in hundreds of conventional plants) which resist clogging as well as create an extremely high rate of oxidation. Supervision is simplified by use of a pre-programmed panel which controls all functions.

No clarifier, sludge recycle pump stations, sludge return pumps or bridgework are involved, so construction costs are minimized. Tank walls can be reinforced concrete or steel. No rotating shafts, gear drives or submerged bearings are used, so maintenance costs are low, too. Energy needs are also very low.

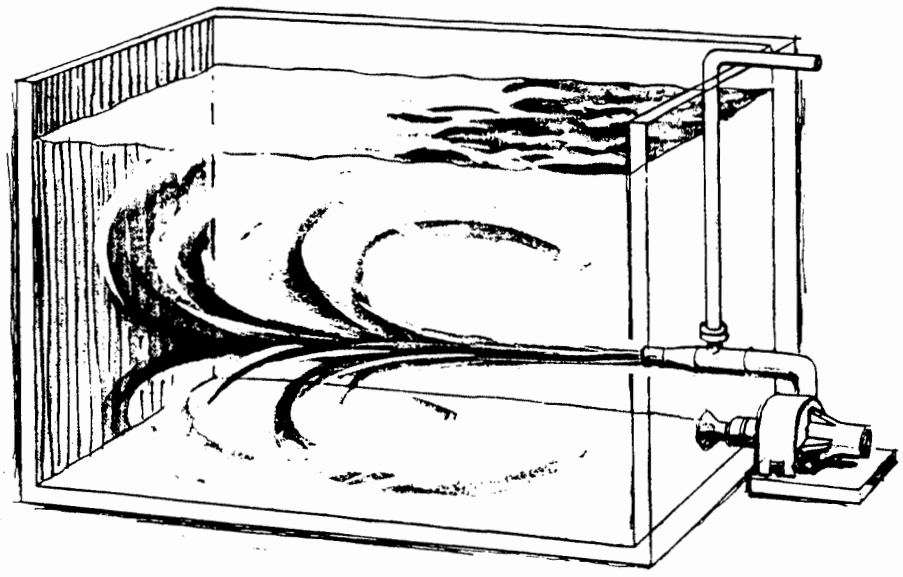
Basically, it's a one-tank system

Conventional continuous-flow treatment systems employ separate staged tanks arranged in a series to process wastewater.

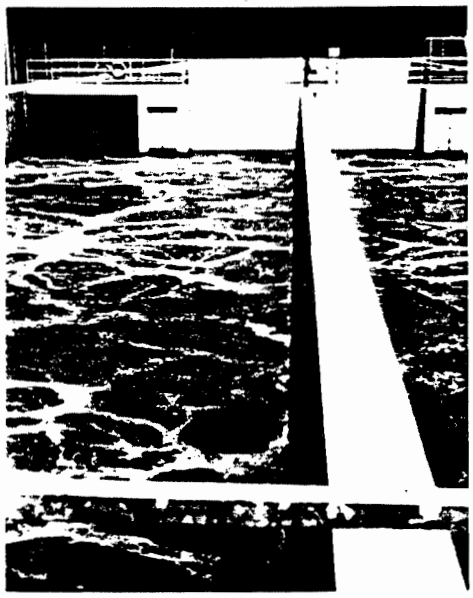
A Fluidyne SBR System does it all in just one tank. You may put several SBR tanks in operation, but that's modular adjustment to capacity needs.

Each SBR tank is equipped with a jet aerator and an arrangement of baffles to carry wastewater through all processes — biological oxidation, sedimentation, nitrification and denitrification. These processes occur in a timed sequence during five basic operating modes or periods: (1) fill, (2) react, (3) settle, (4) draw and (5) idle (anoxic fill).

According to control panel programming, the fill period includes contact with micro-organisms, mixing and — for at least part of the period — aeration. (Aeration may be stopped sometime during the fill to promote settling and/or

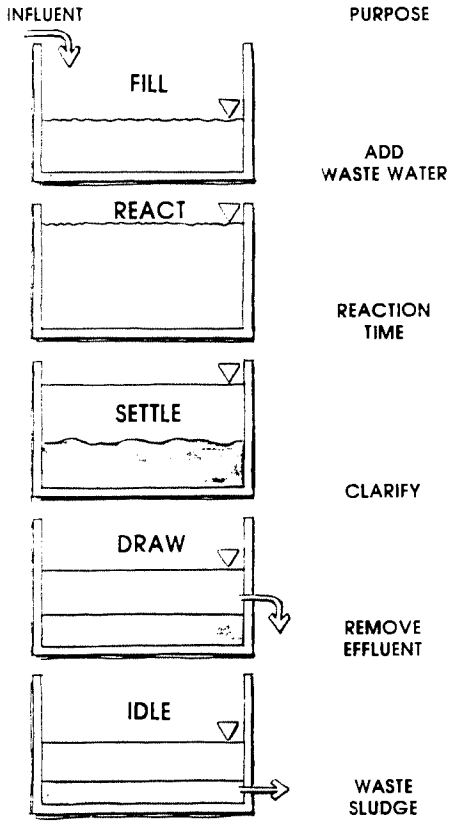


In aerating modes, tank contents are pumped through the jet's inner nozzle into a suction chamber, drawing and mixing with air from an air line, and are then ejected from the larger nozzle into the main tank volume. The resulting homogeneous **fine bubble** entrainment produces a high oxygen-liquid transfer while imparting movement to the tank. The air is stopped during mix-only modes.



Fluidyne's Sequencing Batch Reactor System consists essentially of jet mixer and pump assemblies (one on standby), collecting decanter, a control panel and an arrangement of baffles within a tank. Low-pressure blowers are supplied as part of the jet aeration system for larger plants.

SINGLE TANK SBR



denitrification.) The air supply and mixing are adjusted during the react period. Then the tank is allowed to settle, leaving clarified water to be decanted during the draw. Mixing and aeration of the remaining sludge can be resumed during the idle period, while waiting for new influent.

In a multiple SBR system, different tanks will be in different modes, with incoming wastewater directed to the first idling unit. A single-tank SBR system can be adapted for either a continuous or non-continuous inflow.

Sludge wasting needs range from the infrequent in low-yield single tank systems: to once each cycle in high-yield multiple tank systems.

You get a system to suit

We can adapt a Fluidyne SBR System to a wide variety of plant sizes, wastewater characteristics and effluent requirements — in rectangular tanks, circular basins or oxidation ditches.

We custom design the larger installations and can help you with everything from initial design through start-up. However, we also offer SBR package plants (including tankage) in modules for inflows of 5,000 to 30,000 GPD and SBR pre-engineered plants for in-flows of 20,000 to 100,000 GPD. (See back of this brochure for details and sizing information.)

Components common to all Fluidyne SBR Systems include:

Mixers and aerators — jet nozzle, operating with and without air, providing aerobic oxidation or anoxic mixing. Two jets typically supplied per module; one operates while the other serves as 100% in-place standby.

Decant system — designed to decant clear liquid without scum or disturbance of settled sludge. Handles peak hydraulic flows occuring during storm cycle. Solids excluding design eliminates solids accumulation during react period.

Discharge control system — an innovative, reliable system to meet a variety of discharge requirements. Automatic operation — may be siphon, pump or valve to meet the individual application need.

Process control panel — directs sequential operation of aerators and discharge control valve according to the selected program. A proper sequence will be set during start-up; however, the operator can easily reset for a new sequence.

Influent bar screen — oversized to prevent clogging of jet nozzle and pumps.

Advantages of the SBR System process:

- Jets improve process stability through more effective mixing. The superior process kinetics of the SBR increase biomass activity, providing reaction enhancement. The inherent equalization capability buffers organic or toxic shock loads. The ability to hold without discharging offers the possibility of treatment to a desired level prior to discharge.
- Baffled or sequencing tank design eliminates short circuiting of influent, promotes a fast settling biological floc (low SVI) and enhances substrate utilization.
- Sequencing operation adds to control of shock loads and greatly increases surface settling area for liquid-solids separation.
- Automatic control provides a flexible response to varying load conditions or production schedules, while reducing the operator attention.
- The design eliminates the conventional overflow clarifier and gives simpler and more positive biological solids control. It also eliminates sludge return pumping stations and difficult-to-control "common baffle" sludge return systems.

continued

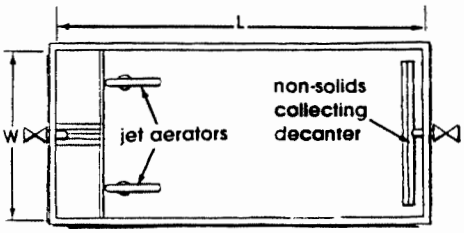
SBR System Advantages *(continued)*

- Fogging, splashing and icing problems associated with surface entrainment aeration are avoided.
- All operating equipment is easily accessible and serviceable. No extended shafts or high maintenance gear drives are used. Retrievable submersible pumps can be serviced locally.
- The system is safer than conventional plants. No personnel work above the tank liquids, no exposed rotating devices are used.
- Jet mixing is highly energy efficient since almost all pumping energy converts to mixing energy. Less horsepower is needed to do the same work than with other systems.

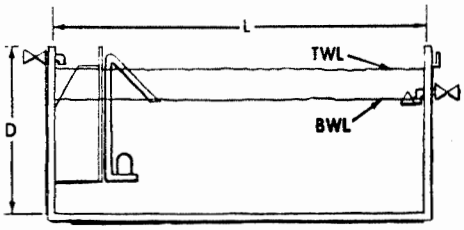
Sizing a standard Fluidyne SBR System

Standard SBR Package Plants and SBR Pre-engineered Plants are available from Fluidyne. The difference between the two types is that Package Plants are furnished with FRP or epoxy-coated steel tankage while Pre-engineered Plants for the larger inflows are supplied less the required concrete tankage. Otherwise both types come complete with all needed mechanical and control components plus any requested design and start-up assistance.

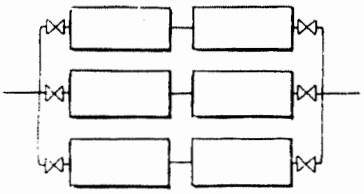
Remember, the plants listed in the charts are modules. You can build larger systems by applying two or more modules.



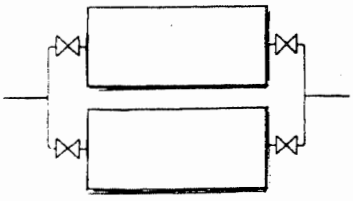
SBR Pre-engineered Plant modules fit in rectangular open concrete tanks, new or existing, provided by others.



SBR Package Plant module featuring horizontal enclosed tank.



Arrange package modules to fit capacity needs — such as three trains of SBR-25's in two stages to build a 150,000 GPD plant.



SBR-1000's in tandem tanks create a 200,000 GPD plant.

STANDARD FLUIDYNE SBR PACKAGE PLANTS
Horizontal enclosed tank, unless otherwise indicated

Model no.	Pop. Equiv.	Flow, GPD @ 100 G/C/D	BOD_5 lbs/D @ 200 mg/l	Tank D x L, ft	Tank vol. usable gal	Pump/aerator HP
SBR-5V*	50	5,000	8.3	11 x 11	7,000	2
SBR-10V*	100	10,000	16.7	11 x 17	11,400	2
SBR-10	100	10,000	16.7	11 x 17	11,400	2
SBR-15	150	15,000	25.0	11 x 27	18,300	3
SBR-20	200	20,000	33.3	11 x 36	24,400	5
SBR-25	250	25,000	41.7	11 x 43	29,100	5
SBR-30	300*	30,000	50.0	12 x 43	34,500	7.5

*Vertical open-top tank

Design is based on influent containing 200 mg/l BOD_5 and 40 mg/l TKN, assuming 100% nitrification and 40% denitrification. Peak sustained flow capability is 2.8 x design flow, peak biosorption flow capability is 4.3 x design. If plantsite is over 2000 ft. elevation, use next size larger aeration system.

STANDARD FLUIDYNE SBR PRE-ENGINEERED PLANTS
Operating equipment — concrete tank by owner

Model no.	Pop. Equiv.	Flow, GPD @ 100 G/C/D	BOD_5 lbs/D @ 200 mg/l	Tank I.D. W x L x H, ft	Tank vol. usable gal	Pump/aerator HP
SBR-200	200	20,000	33	10 x 21 x 17	26,300	5
SBR-300	300	30,000	50	12 x 27 x 17	40,500	7.5
SBR-400	400	40,000	67	14 x 30 x 17	52,500	10
SBR-500	500	50,000	83	14 x 36 x 17	63,000	15
SBR-750	750	75,000	125	14 x 52 x 17	91,000	20
SBR-1000	1000	100,000	167	16 x 60 x 17	120,000	30

Design basis is the same as for Fluidyne SBR Package Plants.
Auxiliary aeration system available for BOD_5 and TKN concentrations of more than 200 and 40 mg/l, respectively.
Auxiliary aeration can increase BOD_5 handling capability of any model by up to a factor of five.

FLUIDYNE CORPORATION

Corporate and National Sales Offices
2140 South Ivanhoe St., Denver, CO 80222
(303) 758-4015 Telex 45-636

Manufacturing and Engineering Facilities located in:
Cedar Falls, IA • Davenport, IA (319) 266-9967
Export Department: Denver, CO Telex 45-636

FLUIDYNE

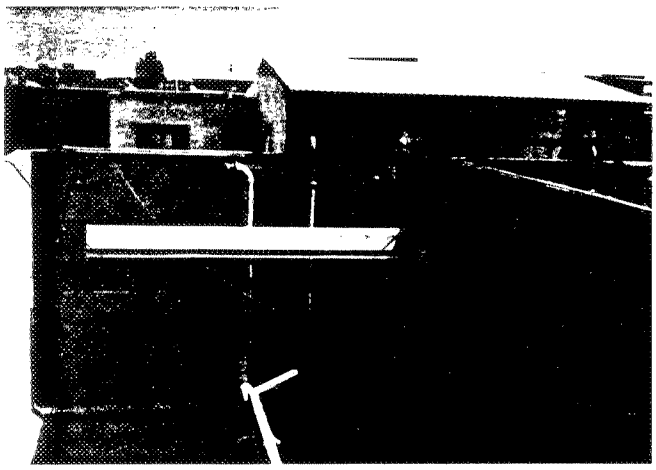
WEF

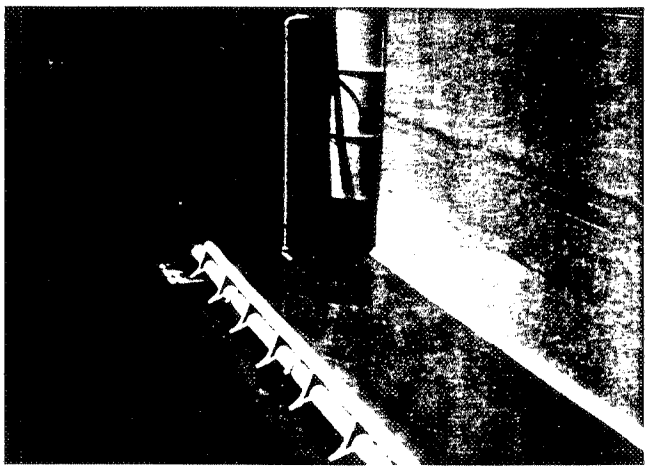
'93 Issue

FLUIDYNE FORUM

PRIVATE GOLF COURSE IN MEXICO RECLAIMS WATER FOR IRRIGATION USE

Fluidyne Corporation has provided Campestre Torreon the first Sequencing Batch Reactor in Mexico that turns municipal wastewater into irrigation water.





The Decision:

Mexico's National Water Commission has recently implemented a series of measures intending to preserve the precious water in the area. The agency increased taxes on aquifer removal rights, encouraged utilization of treated wastewater especially for crops and gardens and promoted well water use for only human consumption in areas of most need.

The administrative body at Campestre Torreon determined that it was not possible to continue to irrigate the golf course with well water, realizing that there was a greater need for potable water in other sectors of the city. The engineers decided that they would reclaim wastewater from the city sewer and use that as their irrigation source.

After much deliberation, it was determined that the Fluidyne Sequencing Batch Reactor would be the ideal treatment system. Campestre Torreon based the decision on several key factors: (1) Ability to maintain the ecosystem in their man-made lakes due to high quality effluent, (2) Lower capital costs over other processes, (3) Minimal operator attention and time, and (4) Ability to surpass the necessary levels of BOD, TSS, and greases/oils needed for irrigation.

The Design:

Fluidyn's SBR was designed to treat 3200 m3/day (864,000 gpd) from the city's sewer line. Influent BOD, TSS, and greases/oils levels were based on 250mg/l, 300 mg/l and 100 mg/l respectively. The NWC has set standards for treated effluent used for irrigation. These are 30 mg/l BOD, 50 mg/l TSS and 20 mg/l greases and oils. Disinfection after treatment was required to control algae and bacteria growth in the lake and to eliminate the high levels of fecal coliforms.

The Process:

From the city line the raw sewage is directed to a primary basin where solids can settle before treatment. Then the liquid travels to a dual tank SBR system. As one tank fills, the other tank proceeds through the different cycles of the SBR. The contents of the tank are mixed and aerated using Fluidyne's high efficiency FRP jet headers. When a tank reaches top water level, inflow is diverted to the other tank so that biological reactions can be completed in the full tank. Then the biological solids settle and the clear liquid is decanted through a Fluidyne FRP Solids Excluding Decanter. (See plan view below). From there the decanted liquid travels through a Fluidyne FRP disinfection system where chlorine is added and mixed by a jet nozzle into a reactor tube. All the above functions are regulated by a programmable logic controller. After disinfection, the effluent flows to a storage tank and then it is pumped to a lake on the golf course where the water can be reused.

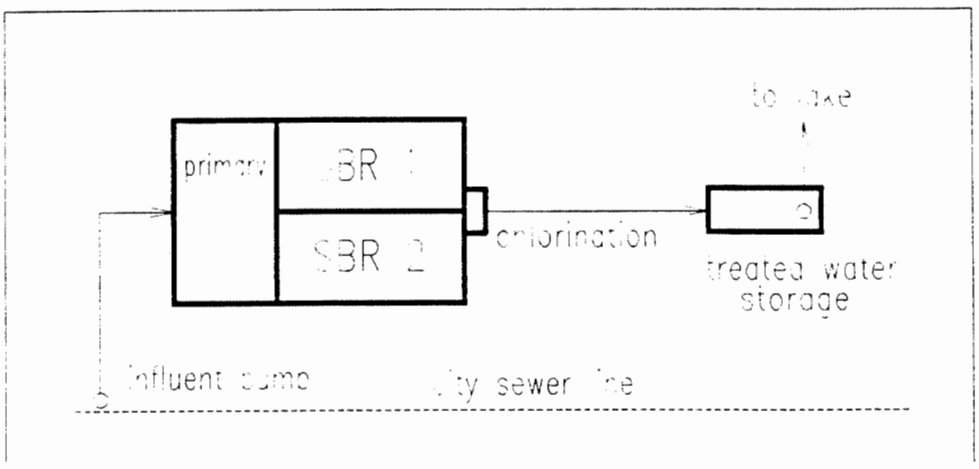
The Campestre Torreon wastewater treatment plant has now been in operation for almost a year and a half. The SBR has easily surpassed all NWC standards. Even the higher than expected grease and oil influent levels are being reduced by over 97%. In February of 1993, the Industrial Metallurgic Laboratory in Mexico tested the effluent quality. The results can be seen in the Table below.

Sample	Influent	Effluent to lake
Greases & Oils	174 mg/l	4 mg/l
TSS	290 mg/l	19 mg/l
BOD	200 mg/l	1.4 mg/l

The Conclusion:

In a country such as Mexico where water is considered so valuable, the Fluidyne SBR now allows a city to take well water that was once used for irrigation and provide it to 2500 additional families. Probably the best way to show the treated wastewater is of high quality is the presence of 3000 to 4000 migratory ducks on the irrigation lake and a thriving fish population in the lake.

The Fluidyne SBR is also beneficial to Campestre Torreon in an economical sense. The golf course now does not have to pay high fees for well water rights. Campestre Torreon expects to recover their investment with the Fluidyne SBR in four years.



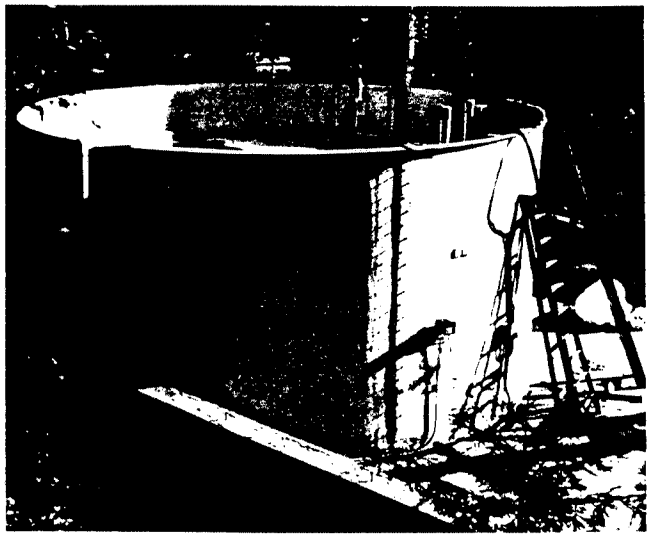
FLUIDYNE SOLVES CAMP PROBLEMS BY SWITCHING TO A SBR

Woodleaf, a Young Life camp for teenagers located in Challenge, California, had a problem with their existing treatment system. Their twenty-year old plant consisted of a septic tank followed by aerobic treatment. From there, the treated effluent was pumped to leach fields via a dosing tank. The problem was that the effluent still contained high levels of BOD, TSS and ammonia which were quickly deteriorating the leach field. Plus, during the peak months of summer terrible odors were annoying the campers.

Young Life wanted to continue on site disposal to safeguard the environment and to insure the camp as the best possible neighbor, above any reproach from downstream water users. Based on this, Fluidyne designed a SBR package that allowed for secondary effluent disposal to the existing leach fields. Woodleaf chose the Fluidyne SBR because of its reputation for high quality effluent, ability to handle variable flow conditions, and capability of removing ammonia and nitrates.

The plant was designed to remove better than 90% of BOD and Total suspended solids and to treat an ultimate flow of 40,000 gpd. However, built into the control mechanisms was a turndown capability to treat lesser flows during periods of low camp population. DO controls were included to provide the greatest oxygen-transfer efficiency.

Photo below: Woodleaf's SBR tank consists of 8 panels constructed by Fluidyne out of fiberglass reinforced polyester and installed by a Fluidyne technician on the job site. The DO controls are mounted on the exterior wall.



MINE ACCIDENT DOESN'T SLOW FLUIDYNE HYDRO-GRIT ™

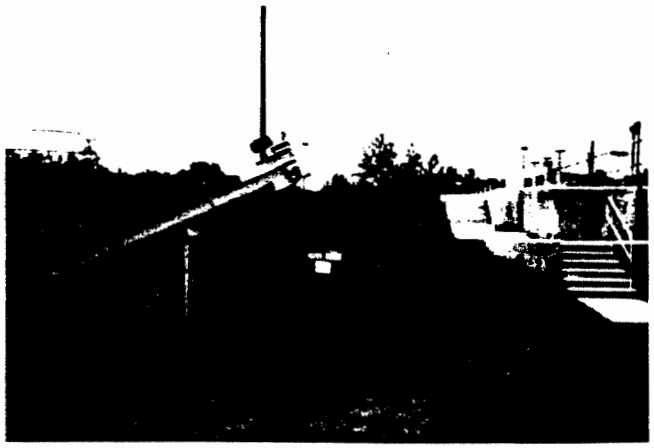
Connellsville, Pennsylvania wanted a system that would successfully remove large amounts of grit from raw sewage before treatment in its 7 MGD plant. So in 1990, the city selected the Fluidyne Hydro-Grit™ based on the systems ability to separate and remove grit particles including fine grit, handle variable feed stream flow rates, and have low energy requirements. The fact that the Hydro-Grit™ was all-hydraulic, non-mechanical, and non-clogging also attracted the city.

Three years later, Fluidyne's Hydro-Grit™ System has worked above and beyond the expectations of the city of Connellsville,

Pennsylvania. Early in 1993, a local contractor was grouting an underground mine and accidentally drilled through the city sewer line. As a result, several tons of fine grained coal refuse grout were carried to the wastewater treatment plant. John Tomaro of Widmer Engineering, the engineer for Connellsville, took a photograph of the Hydro-Grit™ after the coal had been removed from the influent.

In a letter to Fluidyne's sales representative, John Tomaro writes "As witnessed by the photo, the Fluidyne "hydro-grit" chamber performed better than expected in removing this fine grained material from the raw wastewater. As they say "a picture is worth a thousand words" and I would certainly specify this unit on future projects."

Photo below: Fluidyne Hydro-grit classifier after removal of the fine grained coal from Connellsville, PA sewer line.



Information on the Hydro-grit™ is available from Fluidyne or its sales representatives.

TESTS DEMONSTRATE STRENGTH OF FRP

Continued research and testing into the Fluidyne composite materials show the superior strength qualities of Fluidyne fiberglass reinforced polyester. Fluidyne has developed special composites and fabricating techniques which far exceed industry standards. These techniques are used in much of the equipment and tanks Fluidyne supplies to wastewater treatment plants.

Recent linear stress tests conducted by an independent laboratory show the superior strength of Fluidyne products. Two fiberglass samples were tested with one sample withstanding 14,300 psi and the other sample withstanding 14,100 psi. With the majority of Fluidyne's products based on a 1500 psi requirement, the tests demonstrate the durability and sturdiness of Fluidyne products.

Contact Fluidyne for detailed design information and recommendations to meet your requirements in the following areas:

Jet Aeration
Sequencing Batch Reactors
Package Treatment Plants
SBR Pilot Plants
Jet Mixing
Jet Disinfection
Grit Separation and Removal
Fiberglass pipe and tanks

FLUIDYNE

2816 West First Street
Cedar Falls, IA 50613
Phone: (319) 266-9967
Fax: (319) 277-6034

SECOND ADDENDUM TO

ENVIRONMENTAL IMPACT REPORT

LION'S GATE RESERVE

(CordeValle)

LEAD AGENCY: COUNTY OF SANTA CLARA

File #4039-67-28-93
SCH #94043016

June 1998

TABLE OF CONTENTS*

APPENDICES

* The contents only include sections of the EIR that have been revised in this Addendum.

INTRODUCTION

Description of Project Modifications

This Second EIR Addendum has been prepared to address the changes to the Lion's Gate Reserve (Cordevalle) project that have been proposed since the time that the EIR on the project was certified by the County Board of Supervisors in August 1996 and the first EIR Addendum was prepared in January 1997.

The main changes to the project addressed in this EIR Addendum include the following: 1) relocation and redesign of the clubhouse/overnight complex; 2) modifications to the golf course plan to accommodate the relocation of the clubhouse complex; 3) elimination of the previously proposed equestrian center and its replacement with a much smaller stable near the northeastern portion of the site; 4) changes to the boundaries of the golf course parcel and the cluster subdivision/permanent open space parcels resulting from the above project modifications, and 5) modification of the proposed on-site flood control facilities such that there would be a reduction in flood flows leaving the site during frequent storm events such as the 2-year event. These project changes are described in detail below, followed by a summary evaluation of potential impacts resulting from these modifications. The changes to the EIR resulting from these project modifications are addressed in the body of this addendum. It should be noted that there are two additional new project elements which are expected to be added in the future and which are not covered in this addendum. These include a future winery/grape processing facility and a water storage tank. These future facilities are briefly described below under 'Future Project Modifications'.

Clubhouse/Overnight Complex

The clubhouse facilities, overnight guest units, and associated parking area are now proposed to be located on the northern side of the West Branch of Llagas Creek instead of the south side as previously proposed. The size of the clubhouse facility has also increased somewhat and the layout and design of the complex has also been altered to be more low profile in character with greater separation among buildings. (The site plan and elevations for the redesigned complex are included in the EIR text portion of this Addendum.) The increase in floor area for the clubhouse has been necessitated largely because the original concept plan underestimated the space requirements for the various clubhouse functions. (A detailed floor area breakdown for clubhouses functions is provided in the text of this EIR addendum.) The number of overnight units remains the same at 45; however, the total floor area of guest units is actually slightly less than originally proposed due to a reduction in meeting room space. The parking area and planned drainage improvements for the complex and parking area are also to be modified, and the total number of parking spaces has increased.

The larger overall land area required for the complex has increased for several reasons including: the clubhouse facilities are now largely planned for one main floor instead several stories as originally proposed; the guest units are now planned to consist entirely of single story units instead of the two-story buildings as originally planned; the separation among buildings has increased to create a campus-like setting; the overall square footage of the clubhouse has increased, and; the increase in parking spaces has resulted in a larger area devoted to parking.

The main changes resulting from the relocation and reconfiguration of the clubhouse/overnight complex are summarized in the table below. This table shows figures from the certified EIR (July 1996), as well as figures reflecting the design first approved by the Architectural and Site Approval Committee (ASA) in June 1997, in addition to the currently proposed changes to be considered by ASA on June 11, 1998.

	EIR (7/96)	1st ASA (6/97) (approved)	2nd ASA (6/98) (proposed changes)
Clubhouse/Overnight and Parking Acreage	6.3 acres*	15.6 acres	19.1 acres
Clubhouse Complex Floor Area	29,170 sf	±45,000 sf	55,100 sf**
Overnight Complex Floor Area	34,000 sf	±41,000 sf	32,500 sf
Parking Spaces	250	320	350

* Did not include parking area at driving range.
** Includes 3,200 sf freestanding pro shop.

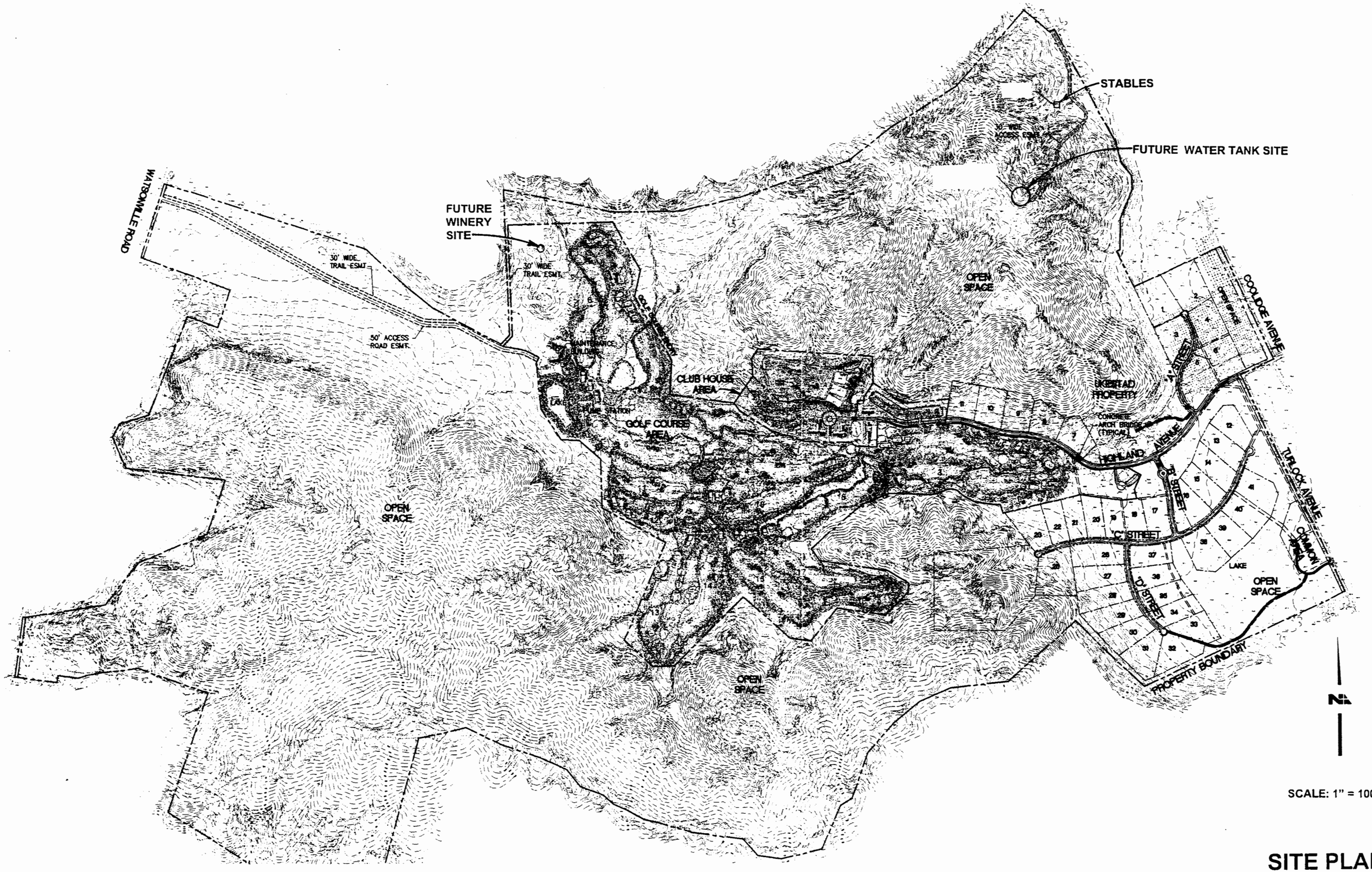
The new clubhouse location is preferred by the applicant because it provides more land area for the facilities, thus allowing for a less intense building pattern. The new site has better sun exposure with its southward orientation, and it also offers better views of the golf course and Lion's Peak, as well as better protection from the wind. The new clubhouse/overnight complex site is located to the south of a series of low ridges and hills where it is completely screened from view from off-site locations. The new site avoids the use of retaining walls, and also avoids the landslide on the adjacent hillside to the south, which required a geotechnical engineering solution for the previous clubhouse location. The clubhouse/overnight complex will be sited a minimum of 75 feet from the main creek channel and the tributary channel to the east. The new location allows the parking area to be consolidated into a single location north of the main access road, and allows siting of the parking area closer to the clubhouse area. The new parking lot location is several hundred feet from the main creek channel and 75 feet from a tributary channel at its nearest edge. No tree removal is required at the new clubhouse location.

The proposed location of the complex on the north side of the creek also eliminates the need for a vehicle bridge across the creek, as well as crossings by sanitary sewer and utility lines. The County Fire Marshal's office has indicated that the new location and configuration for the clubhouse/overnight complex is preferable to the previous plan because the shorter length of the access road would improve response times, the less steep slope of the fire access route to the overnight units improves accessibility, and the generally better accessibility of single-story structures compared to multi-story buildings proposed previously.

The new location of the clubhouse complex is partially in an area that was previously planned for golf course fairways. The necessary adjustments to the golf course plan resulting from the clubhouse relocation are described below.

Golf Course Modifications

Several changes to the proposed golf course layout have been made to accommodate the relocated clubhouse and overnight complex. The original hole #7 was eliminated to make way for the clubhouse which resulted in several adjustments to the layout and routing of the golf course, including some changes in golf hole numbering. To replace hole #7, a new hole (#2) is planned near the eastern end of the golf course along the south side of the main access road. The new hole #2 does not cross the main creek channel as the old hole #7 did, and thus results in fewer potential impacts to the creek. In addition, hole #18 was lengthened by extending it into the former clubhouse site. The old 18th hole drainage swale and lake were replaced by a broader and deeper swale that runs down the length of the left side of the hole and discharges over a weir into the creek. In the revised plan the retention basin has been moved westward to the north side of the 11th hole. The external boundaries of the golf course parcel were also moved inward in several places including the former site of the overnight units,



SITE PLAN

Source: PACE Engineering

the area west of the 13th hole and south of the irrigation reservoir, and the north edge of driving range (which has been substantially reduced in area).

As a result of the above modifications, the overall acreage of the golf course parcel (which includes the clubhouse/overnight complex) increases from 270 acres to 277 acres. The areas of boundary expansion occur at the currently proposed location of the overnight complex and at the site for a new winery/grape processing facility proposed near the northwestern edge of the golf course (see 'Future Project Modifications' below. These expansions are largely compensated by the golf course boundary contractions noted above, such that the net increase in acreage for the golf course parcel is 7 acres (270+7=277). The modifications to the golf course plan result in environmentally beneficial changes such as reduction of number of holes crossing the main creek channel from 3 to 2, and a reduction in overall tree removal from 18 to 16.

The refinements to the golf course design have also resulted in an increase in overall earthwork quantities. The total volume of cut has increased from 344,390 cubic yards (cy) in the EIR to 414,650 cy under the current grading plan, and the total volume of fill has increased from 269,900 cy in the EIR to 387,900 cy under the current plan. These grading increases have been necessitated by the following design changes: additional fills needed to elevate the tee and green sites; additional grading at the practice facility/driving range to provide flatter grades at the tee boxes and smoother slope transitions throughout; changes to the drainage plan along the 18th hole to provide a more naturalistic surface drainage pattern instead of underground pipes, and; deepening of the irrigation lake to provide additional storage capacity. As originally proposed, cuts and fills would be balanced on-site.

Elimination of Equestrian Center and Replacement with a Small-Scale Stable

The original project proposal evaluated in the EIR included a full equestrian center on 12.8 acres in the southeast corner of the project site. As described in detail in the EIR, this was to have been a 40,000 square facility with space for up to 30 horses, a covered riding arena, living quarters for a caretaker/manager, an outdoor riding ring, a training area/paddock and pasture, a paved access road and parking area, and an on-site retention basin to capture runoff from the site. The applicant proposes to eliminate the equestrian center from the project. In its place, a small stable large enough for up to 10 horses is planned for the northeast corner of the site, where it would be removed from the residential subdivisions and yet provide convenient access to the on-site riding trails. The stable would have a floor area of up to 4,000 square feet and would occupy 1 to 2 acres, which includes the stalls plus a small storage area for hay, and an adjoining area for corrals. The stable would have an informal rustic design to fit in with the rural surroundings. The stable is intended solely as a place for homeowners of the project to keep their horses and would not include the other facilities previously proposed for the equestrian center.

Boundary Modifications to Golf Course and Permanent Open Space Area

The land use modifications discussed above result in changes to the boundaries of the golf course parcel and the permanent open space area. As discussed above, the expansion of the clubhouse/overnight complex and the future addition of the winery/processing center would result in a net increase of 7 acres in the westerly portion of the golf course parcel. In addition, minor modifications made to the cluster subdivision plan since the EIR was certified in July 1996 has resulted in an expansion of the residential cluster subdivision by 11.2 acres. Also, the wastewater treatment plant added in 1997 (see EIR Addendum of 1/97) occupies a 5.3-acre common area that was originally within the permanent open space area. The net effect of these modifications is a 24-acre reduction of the permanent open space area (from 1,265.7 acres to 1,241.7 acres). As shown below, this reduced open space area still comprises sufficient land area to comply with the 90 percent open space requirement applicable to the hillside cluster subdivision.

	Acreage per EIR (7/96)	Current Acreage
Golf Course	269.5	277.0
Rural Residential	31.5	31.5
Common Area (WW facility)	--	5.3
Hillside Cluster		
Residential	102.8	114.0
Main Access Road	6.5	6.5
Permanent Open Space	1,265.7	1,241.7
Total Site	1,676.0	1,676.0

Hillside Cluster Parcel	
Total Acreage	1,362.2 acres
Permanent Open Space Required (@ 90%)	1,225.9
Permanent Open Space Provided	1,241.7
Excess Permanent Open Space	15.8 acres

Flood Control Improvements

The changes proposed to the project plans include modification of the proposed on-site flood control facilities. In general, these flood control modifications would provide for a substantial reduction in flood flows leaving the site during more frequent storm events such as the 2-year storm. These improvements would also result in significant reductions in the 100-year and 10-year flows compared to the previously proposed flood control improvements.

The main features of the modified flood control plan are the creation of a diversion channel to parallel the existing West Branch of Llagas Creek at the east end of the project, and the diversion of flood flows carried by the creek and the diversion channel to a 5-acre detention basin alongside Coolidge Avenue north of Highland Avenue. The residential lake south of Highland Avenue would provide detention storage for the adjacent residential area and tributary uplands only. Under the previous plan, a substantial portion of the flood flows carried by the West Branch of Llagas Creek during the 100-year and 10-year events were to have been diverted to the residential lake. This would have provided a significant improvement over existing conditions for these events, but would not have provided reductions in downstream flooding during the more frequent storm events like the 2-year storm, as proposed under the current plan. (The proposed flood control improvements are described in detail in Section *IV. E. Hydrology and Drainage*.)

Future Project Modifications

In addition to the project modifications described above, two new components are expected to be added to the project in the future, which are not described above. These include the following:

1) A 400,000 gallon water storage tank proposed for the northeastern portion of the property which would provide for adequate fire flows to the project and to the neighboring residential areas to the east;

2) A winery/grape processing center which would provide on-site processing for grapes grown in the western portion of the site in accordance with County agricultural mitigation requirements for the project.

The winery/processing center would be located in the northwest portion of the site north of the golf course maintenance facility and would not be open to the public. The winery site consists of land currently allocated to permanent open space which would be removed from permanent open space and included in an expanded golf course parcel. However, as shown above there is sufficient 'surplus' permanent open space area in the project plan that this reduction would not result in the ratio of permanent open space falling below the 90 required for the hillside cluster subdivision.

This EIR Addendum is not intended to provide environmental clearance for the water tank or the winery/processing center. Since these project elements will require individual use permit applications which have not yet been submitted, it is premature to conduct environmental review for these facilities at this time. However, an informal environmental review indicated that these facilities would not result in potentially significant impacts. Therefore, a subsequent EIR addendum will be prepared on these new project components in conjunction with the use permit application process.

Summary Evaluation of Potential Impacts Resulting from Project Modifications

The proposed modifications to the Lion's Gate/CordeValle project would not result in any new significant environmental impacts and in some instances would result in beneficial environmental effects compared with the project evaluated in the EIR. The environmental effects of the project modifications are briefly evaluated below.

Land Use: The increased floor area and land coverage of the clubhouse/overnight complex results in a slight increase in the project's land use intensity. The revised complex would result in an approximately 5 percent increase in impervious surface coverage relative to the project evaluated in the 1996 EIR. However, the overall building intensity is still extremely low, with built and paved surfaces occupying approximately 6 percent of proposed development area and 1.5 percent of the entire project site. Therefore, the proposed increase in building area does not represent a significant impact. No changes are required to EIR Section *III. A. Land Use.*

Parks, Recreation and Open Space: The project modifications result in a reduction of permanent open space from 1,265.7 to 1,241.7 acres. This 2 percent reduction does not represent a significant impact, and the total open space allocation still exceeds the 1,226 acres required to fulfill the 90 percent open space requirement for the Hillside cluster subdivision. EIR Section *III. C. Parks, Recreation and Open Space* has been amended accordingly.

Geology and Soils: The relocation of the clubhouse/overnight complex to the north side of the creek removes it from the potential landslide hazard that exists at the originally proposed site. The currently proposed site is not subject to landslide hazard. The new site is traversed by an inactive fault trace; however, any potential hazard associated with the trace can be mitigated by overexcavation and recompaction of foundation soils over the

fault trace, or by deep foundations such as drilled shafts or driven piles, or by modifying the location of structures away from the fault trace. (This is addressed in detail in the geologic report prepared by Twining Labs in May 1998, which is contained in Appendix C of this EIR Addendum.) EIR Section *III. D. Geology and Soils* has been amended accordingly. All other geologic and soils conditions at the new clubhouse site are essentially the same as those at the previously proposed clubhouse site.

Hydrology and Drainage: The proposed flood control modifications would provide for a substantial reduction in flood flows leaving the site during more frequent storm events such as the 2-year storm. These improvements would also result in significant reductions in the 100-year and 10-year flows compared to the previously proposed flood control improvements. The environmental effect would be beneficial relative to the improvements evaluated in the 1996 EIR. Section *III. E. Hydrology and Drainage* has been amended accordingly. The Master Drainage Plan prepared by PACE Engineering which describes and evaluates the flood control modifications is contained in Appendix D of this EIR Appendix.

Water Quality: The removal of the equestrian center from the plan would avoid the creation of potentially contaminated runoff from the center. Although the equestrian center plan provided for isolation of the center from the surrounding drainage area and included an exclusive retention basin to capture runoff, the elimination of the center is environmentally beneficial in terms of potential water quality impacts. The smaller stable now proposed for the northeastern portion of the site would be managed in accordance with County and state requirements to prevent water quality impacts from this facility.

Surface drainage from the relocated and redesigned clubhouse parking lot will be conveyed to underground drains in the adjacent golf course and passed through a biofilter prior to discharge into West Branch Llagas Creek. The previous proposal was to convey discharge to adjacent retention basins. The net effect on water quality would be about the same under the previous and current proposals. EIR Section *III. E. Water Quality* has been amended to reflect the above.

Biological Resources: The revised site plan has been evaluated by H.T. Harvey and Associates. The biologists surveyed the new site for the clubhouse complex and the new stable site and found no sensitive species or habitats that would be affected by these project modifications. Therefore, the proposed modifications would result in no new potential impacts to biological resources. No changes are required to EIR Section *III. F. Biological Resources*. The letter report prepared by Harvey and Associates which addresses the project modifications is contained in Appendix F of this EIR Addendum.

The revised golf course routing plan results in a reduction of fairways crossing the main creek channel from 3 to 2. This will tend to reduce the incidence of golfers entering the creek channel (against course rules) to retrieve errant golf balls, and as such would reduce impacts to riparian habitat.

The revised golf course plan results in a reduction of overall tree loss from 18 to 16 trees, which represents a beneficial effect of the revised plan.

Archaeology: The new location for the clubhouse complex and the new stable site are not within areas of archaeological sensitivity and there are no known archaeological resources in the vicinity of these sites. The western end of the bypass channel along Highland Avenue at the project entrance is in close proximity to recorded archaeological site CA-SCl-76. As such, work at the western end of the bypass channel would be subject to monitoring provisions specified in the EIR. None of these changes necessitate modification of EIR Section *III. E. Archaeology*. A letter report on the project modifications prepared by Basin Research Associates is contained in Appendix G of this EIR Addendum.

Aesthetics: At the new location north of West Branch Llagas Creek, the nearby hills completely shield the clubhouse and overnight complex from view from off-site locations, including the residence overlooking the site from the off-site ridge to the north. If anything the clubhouse complex would be better shielded from view by the intervening hills. The new stable in the northeast portion of the site may be visible from existing residences to the east, but it would be small in scale and have an informal rustic appearance that would blend in with its rural surroundings. The potential visual effects of the proposed flood detention basin adjacent to Coolidge Avenue would be mitigated by the landscaped berm planned along the roadway frontage. Therefore, the project modifications would not result in new or increased visual impacts. EIR Section *III. J. Visual and Aesthetics* has been modified to reflect the above.

Traffic: The larger clubhouse proposed would generate additional traffic since the restaurant component increases in size from 4,000 square feet to approximately 5,800 square feet. An evaluation of the project changes by TJKM Transportation Consultants estimated that total p.m. trip generation from the project would increase by 15 trips as a result of the larger restaurant component. The other modifications would not result in increased trip generation. It was calculated that this additional trip generation would have no effect on levels of service or average vehicle delay at any of the potentially affected intersections. Therefore, the project modifications would have no traffic impacts. No changes are required to EIR Section *III. K. Traffic and Circulation*. The letter report by TJKM that addresses the project changes is contained in Appendix H of this EIR Addendum.

Noise: The relocation of the clubhouse to the north would bring this facility closer to the existing residence on the northern ridge overlooking the site. The new clubhouse location is 3,000 feet from this residence while the original clubhouse location was 3,600 feet away. The analysis in the 1996 EIR concluded that loud music played at the clubhouse during weddings or similar events may be audible at the existing residence under certain conditions but would not result in significant noise impacts. The new clubhouse location was evaluated by Illingworth & Rodkin who concluded that the new location would result in noise levels 2 decibels louder than at the previous site, but that the resulting noise levels would be within the range indicated in the EIR. The new clubhouse location would not result in noise impacts to the existing residence. The letter report by Illingworth & Rodkin that addresses the noise impacts of the project changes in contained in Appendix I of this EIR Addendum.

One of the golf course modifications involves the siting of a new hole (#1) along the south side of the main access road, just south of several planned lots for rural residential dwellings. The new hole would result in fairway mowing at a distances as close as 120 feet from these future residences, compared with a minimum distance of 200 feet under the previous plan. This will result in mower noise being louder at the residences than under the previous plan. However, the County noise ordinance allows for noise sources to exceed County standards if the duration of the noise is limited as prescribed in the ordinance. There is not expected to be any difficulty in meeting these time restrictions. Therefore, this project modification would not result in a significant noise impact. EIR Section *III. L. Noise* has been amended to reflect the above.

Air Quality: The slight increase in traffic generated as a result of the larger restaurant component proposed for the clubhouse would also increase the generation of vehicle emissions. However, according to air quality consultant M'OC Physics Applied, this increase would not be significant in terms of either local carbon monoxide concentrations or in term of pollutants of regional concern. No changes are required to EIR Section *III. M. Air Quality.*

Hazards: The removal of the equestrian center from the plan reduces the concern for potential vector and odor impacts. Although similar issues arise for the new stable, the potential for impacts is much reduced due to the

smaller scale of the stable. EIR Section *III. N. Hazardous Materials, Public Health and Safety* has been amended to reflect the above.

Rationale for Preparation of an EIR Addendum

This document has been prepared in accordance with the requirements of the California Environmental Quality Act (CEQA) which sets forth specific requirements for the documentation of potential environmental impacts which may result from modifications made to a proposed project after an EIR on the project has been certified. Under these circumstances, Sections 15162 through 15164 of the CEQA Guidelines provide for the preparation of one of three types of documents depending on the situation. The criteria to be met for each type of document are as follows: 1) a 'Subsequent EIR' shall be prepared if the changes to the project are substantial, and will result in major revisions to the EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; 2) a 'Supplement to an EIR' shall be prepared if the conditions described in #1 above apply but only minor changes or revisions to the EIR are necessary; and 3) an 'Addendum to an EIR' shall be prepared if some minor changes and additions are necessary, but the conditions which would necessitate the preparation of a Supplement to an EIR are not present. In the present case, the proposed modifications may or may not be considered substantial, but the overall effect of the changes would be beneficial environmentally, and in no instance would new significant environmental effects be involved or the severity of a significant effect be increased substantially, as discussed above and in the body of this document. In addition, the changes to the EIR required to address the proposed project modifications are minor in nature. Thus two of the required criteria for preparing a Subsequent EIR and one of the required criteria for preparing a Supplement to an EIR would not apply. Therefore, according to CEQA criteria noted above, the type of environmental document that should be prepared in this instance is an 'Addendum to an EIR.'

Organization of This Document

Since this is the Second Addendum to the EIR, this document identifies revisions to the certified EIR, as modified by the first Addendum, which reflect the changes in project description and environmental analysis resulting from the proposed modifications to the project. In order to facilitate the reader's comprehension without having to refer back to the certified EIR and the first Addendum, this document contains the affected portion of the EIR to provide a context for the text changes. Revisions to the text are indicated by ~~strikethrough~~ for deletions and underline for additions.

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SUMMARY OF IMPACTS AND MITIGATIONS

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IMPACT	MITIGATION
D. GEOLOGY AND SOILS	
1. Potential secondary ground rupture or sympathetic movement along inactive faults crossing the site may result in minor damage to structures, roadways and utility lines. **(Potential Significant Impact)**	1. Where proposed structures for human occupancy are determined to be underlain by an inactive fault trace, mitigation could consist of modification of the soil foundation, using deep foundations, or modifying the location of the structure away from the shear zone. ~~Appropriate setback distances from those structures may be required.~~ **(Less-than-Significant Impact with Mitigation)**

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E. HYDROLOGY AND DRAINAGE	
1. The project would potentially result in increased downstream flooding during the 100-year and 10-year storms. **(Potential Significant Impact)**	1. ~~The on-site lake proposed for the southern residential cluster subdivision would be designed to provide sufficient detention storage for increased peak runoff resulting from site development. In addition, a diversion structure would be constructed in the creek channel to divert a substantial portion of the flows exceeding the existing 10-year flow rates to the residential lake, which would be sized to accommodate flows from the 100-year event. With these facilities, the peak flow rates leaving the project site during significant storm events would be substantially lower than under existing conditions.~~ In order to control and detain flood flows generated at the site, a diversion channel, a detention basin and a lake are proposed. These structures would be designed to minimize the extent of flooding within the project boundaries, and would reduce peak flood flows leaving the site during the 100-year, 10-year, and 2-year events relative to existing conditions. **(Less-than-Significant Impact with Mitigation)**

IMPACT	MITIGATION
E. HYDROLOGY AND DRAINAGE (CONT'D)	
2. Portions of the residential cluster subdivisions and the wastewater treatment facility ~~would~~ may be subject to shallow flooding (one-foot average depth) during a 100-year event, and the proposed structures could also partially obstruct this sheet flow through the site. However, the total area of the site that may be subject to shallow flooding would be reduced by flood control improvements included in the project. **(Potential Significant Impact)**	2. Potential impacts to the residential subdivisions and the wastewater treatment facility from shallow flooding would be mitigated by constructing building pads on fills raised above flood elevations. The partial obstruction of shallow overland sheet flows by the proposed development would be mitigated by balancing fills with cuts within the flood-prone areas. **(Less-than-Significant Impact with Mitigation)**
* * *	
L. NOISE	
5. Noise levels would be temporarily elevated during grading and construction. **(Potential Significant Impact)**	5. Short-term construction noise impacts would be reduced through compliance with the County's Noise Ordinance with respect to hours of operation and maximum noise levels at adjacent property lines. At the eastern edge of the project, the berms proposed along the project boundary would be constructed during the early phases of grading to provide a noise barrier for existing residences nearby. **(Less-than-Significant Impact with Mitigation)**

I. PROJECT DESCRIPTION

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B. DESCRIPTION OF THE PROPOSED PROJECT

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Cluster Residential Subdivisions

The project would include two main residential clusters and related open space areas, as described below.

Rural Residential Cluster Subdivision

The 31.5-acre Rural Residential parcel is located at the eastern edge of the site, adjacent to Coolidge Avenue, north of Highland Avenue. The proposal is to cluster the 6 permitted lots in the western portion of this parcel, with lots ranging in size from 1.7 to 2.5 acres. The eastern and southern edges of the site would remain in permanent open space. The old plum and walnut orchard would be removed and replaced with a 4 foot high

TABLE 1

PROPOSED LAND USES

Land Use	Acreage
Golf Course	
• Open Area	~~263.2~~ 239.9
• Clubhouse, Overnight Facilities & Parking	~~6.3~~ 19.1
• Winery Site	18.0
Residential	
• Hillside Cluster	~~102.8~~ 114.0
• Rural Residential Cluster	31.5
Permanent Open Space	~~1,265.7~~ 1241.7
Main Access Road	6.5
Common Area (Wastewater Treatment Facility)	5.3
TOTAL	1,676.0

landscaped berm along the roadway.~~, and a vineyard of approximately 10 acres would be planted behind the berm. This buffer area would range in depth from 250 to 400 feet, comprising a total of approximately 12 acres.~~ Just west of the berm, a detention basin would be excavated to provide flood storage during major storm events and reduce downstream flooding. The southern portion of this site would contain the channel of West Branch Llagas Creek, which flows from west to east alongside Highland Avenue. To prevent flooding along the banks of the creek through this area, a diversion channel would be created which would run parallel and to the south of the creek channel (see 'Drainage' below).

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Permanent Open Space

The Hillside cluster subdivision would include a ~~1,265~~ 1,242-acre permanent open space area which would constitute over 90 percent of the Hillside zone on the site. (This ~~assumes that~~ includes the 259 acres ~~currently~~ formerly designated "Agriculture - Medium Scale" in the County General Plan ~~would be~~ that were redesignated to "Hillsides.") Most of this permanent open space area comprises the hillside areas which flank Hayes Valley on the north and south, and also includes the level pasture land in the western portion of the site near Watsonville Road. This area would include a system of informal trails for hiking and horseback riding.

~~A small portion (less than one acre) of the northern hillside area adjacent to the golf course driving range would provide the site for winter storage of treated effluent prior to spray irrigation on the driving range.~~

The permanent open space area would include a public trail easement for the proposed San Martin Cross-Valley Trail, which would follow the northern boundary of the site. The trail would be constructed by the County of Santa Clara Department of Parks and Recreation.

The permanent open space area would also include 100 acres of vineyard to be planted ~~in two areas. A 10-acre vineyard would be planted along Coolidge Avenue, within the 250-foot setback area for the proposed Rural Residential subdivision. A 100-acre vineyard would be planted~~ at the western end of the project, in the open field fronting onto Watsonville Road.

The permanent open space area also includes an area of approximately ~~40~~ 35 acres in the southeastern corner of the site. This area would include: buffer areas around the residential lots, a 4-foot landscaped berm along Turlock Avenue, and a 20-acre lake. ~~and a 20-acre equestrian center (see 'Drainage' and 'Equestrian Center' below).~~

The permanent open space areas of the site would be placed in the ownership of the Homeowners Association for the project, and would not be open to the general public, except for the public trail easement described above. The grazing of cattle on the Lion's Gate site (which currently reaches a peak of 250 head) would be discontinued upon construction of the project.

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Golf Course

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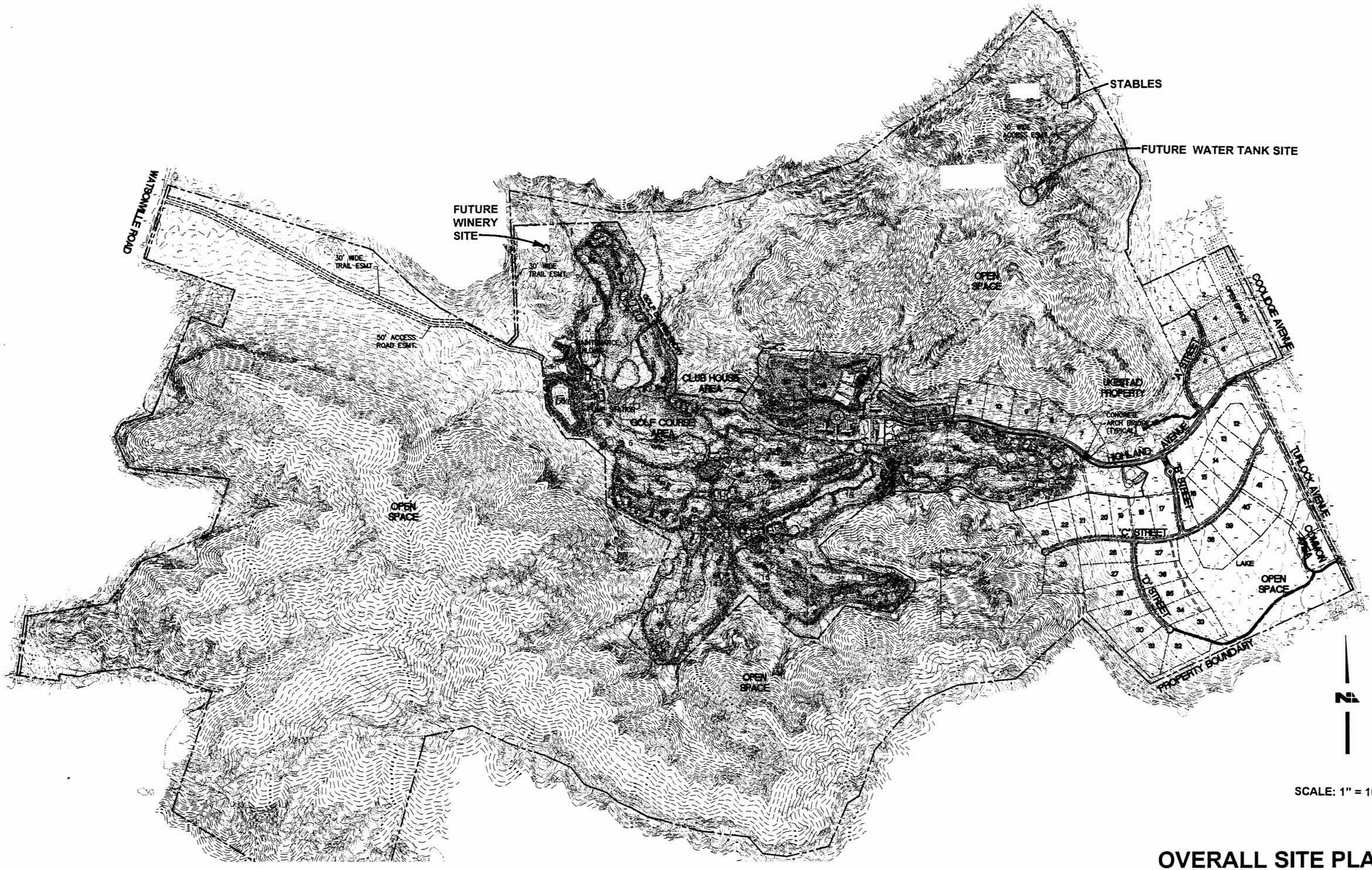
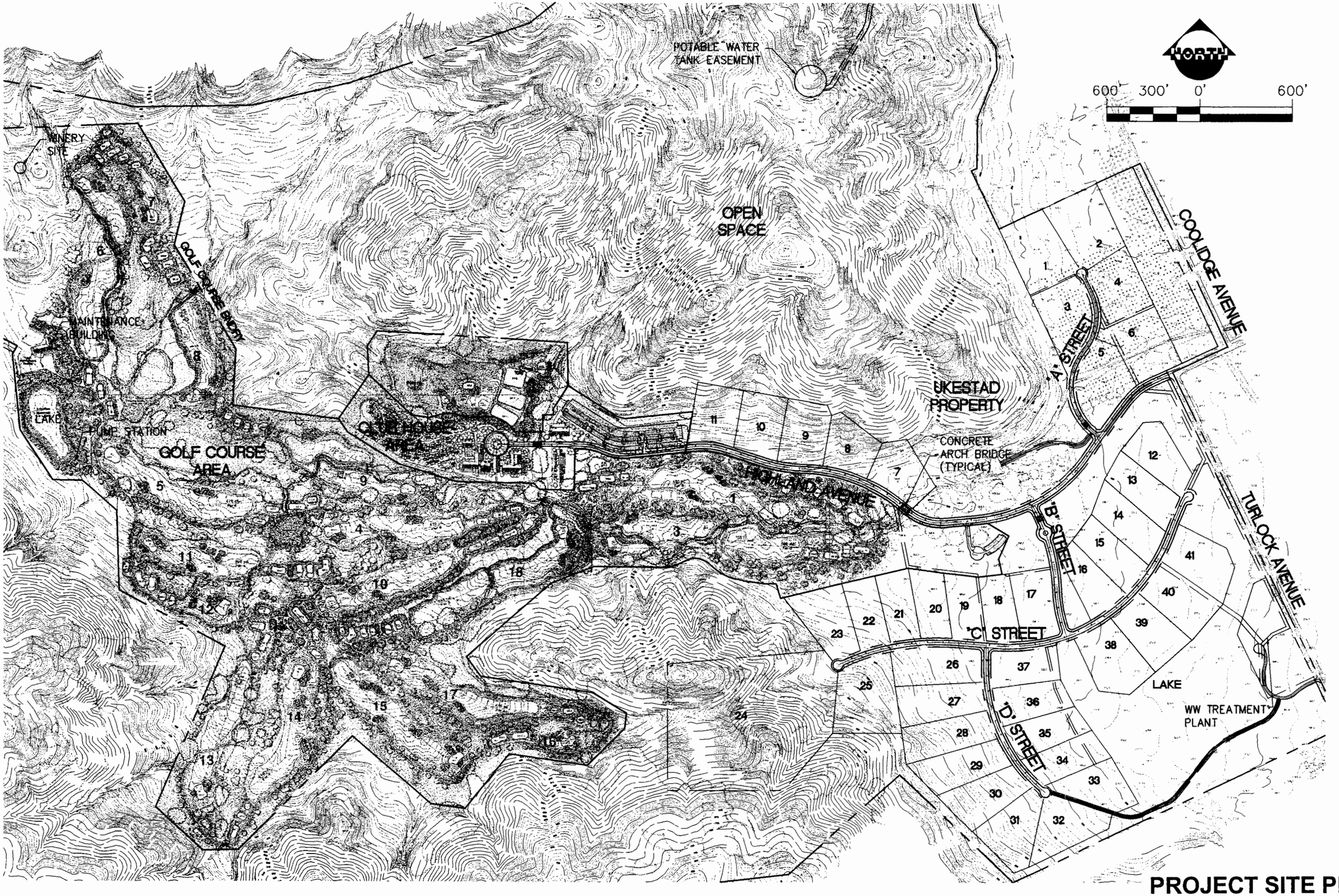
The total quantity of earth to be moved during grading for the golf course and related facilities is estimated to be approximately ~~one million~~ 760,000 cubic yards. A total of ~~18~~ 16 trees would require removal to accommodate the golf course. These would be replaced by over 2,500 native trees to be planted throughout the golf course and the residential areas of the project. (These are trees that have been specifically grown for the project from acorns and seeds collected from the site in 1989.)



OVERALL SITE PLAN

Source: PACE Engineering

FIGURE 9a



PROJECT SITE PLAN

Source: PACE Engineering

FIGURE 9b

TABLE 2

PROJECT SUMMARY DATA

RESIDENTIAL	
• Rural Residential Cluster Subdivision (lots)	6
• Hillside Residential Cluster Subdivision (lots)	35
GOLF COURSE	
• Holes	18
• Clubhouse (square feet - includes pro shop)	~~29,000~~ 55,100
• Overnight Accommodations (units)	45
• Parking Spaces (Clubhouse, Overnight, Practice Facilities)	~~250~~ 350
• Maintenance Facility (square feet)	6,000
Grading (cubic yards - cut/fill)	~~500,000/500,000~~ 575,000/527,000
Tree Removal (total)	~~18~~ 16
Tree Planting	2,500+
WATER CONSUMPTION (gallons/day) - (average/peak)	
Golf Course Irrigation (non-potable)	334,000/677,000
Domestic/Landscape/Washdown	57,000/114,000
WASTEWATER FLOWS (gallons/day) - (average/peak)	23,000/30,000

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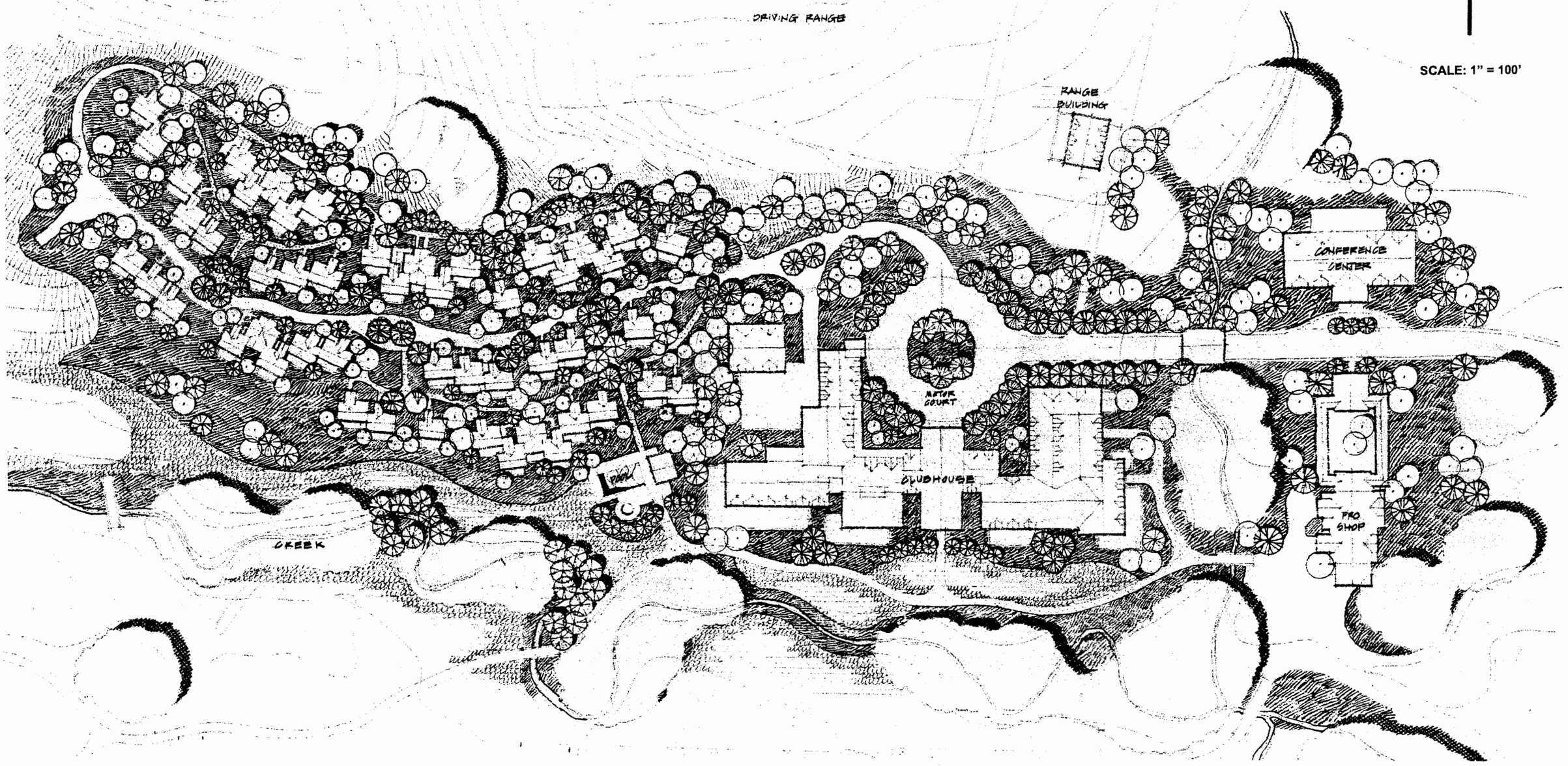
Clubhouse

The focal point of the golf course would be a ~~3-level 29,000~~ 55,122 square-foot clubhouse (inclusive of the ~~golf cart barn~~ pro shop) and 45 units of overnight accommodation. This complex is proposed for the ~~foot of the southern hillsides~~ north side of West Branch Llagas Creek in the east-central area of the site (see Figures 10a and 10b). The floor area breakdown for the clubhouse is provided in Table 3.

TABLE 3 (Revised)

CLUBHOUSE FLOOR AREA BREAKDOWN

Function	Floor Area (Square Feet)	Function	Floor Area (Square Feet)
Main Floor		Upper Level	
Dining Rooms & Mixed Grill	5,840	Staff Locker Rooms	1,600
Bar	640	Staff Lounge	850
Kitchen	2,336	Meeting Rooms	2,520
Main Hall	2,496	Pre-function	1,000
Front Desk & Reception	1,040	Storage	320
Living Room	720	Circulation	740
Office and Administration	2,416		
Business Center	512	Subtotal	7,030
Boutique	1,040		
Fitness Room	1,296		
Maintenance/Housekeeping	2,784	Lower Level	
Restrooms & Circulation	1,040	Wine Cellar	2,472
Tower & Stairs	476	Cart & Bag Storage	7,432
		Subtotal	9,904
Men's Facilities			
Wet Area & Lockers	5,232		
Bar & Lounge & Cigar	2,400		
Attendant	432	Pro Shop	3,200
Treatment Rooms	1,012		
Storage, Hall, Entry, Phones	800		
Women's Facilities			
Wet Area & Lockers	1,252		
Lounge	968		
Attendant	256		
Subtotal	34,988	**TOTAL**	**55,122**



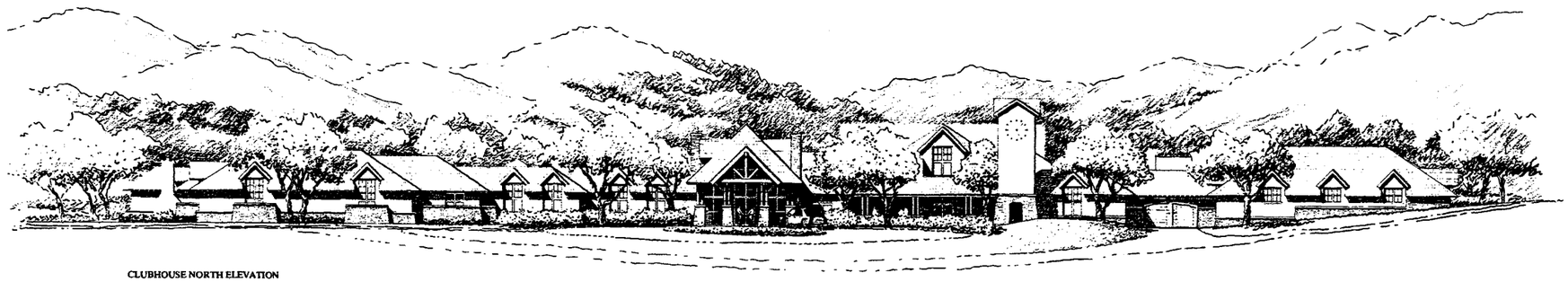
SCALE: 1" = 100'

SITE PLAN - CLUBHOUSE VICINITY

Source: Backen & Gillam

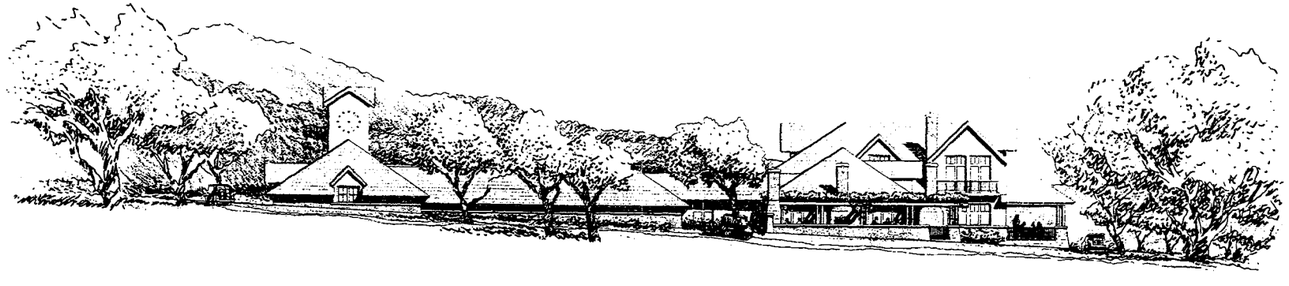
FIGURE 10a

CLUBHOUSE SOUTH ELEVATION



CLUBHOUSE NORTH ELEVATION

CLUBHOUSE EAST ELEVATION



CLUBHOUSE WEST ELEVATION

CLUBHOUSE ELEVATIONS

Source: Backen & Gillam

FIGURE 10b

The clubhouse would be built on three levels, with most functions contained on the main floor at the middle level. The main floor would include a ~~pro shop~~ bar and restaurant, banquet facilities, ~~and a separate members' lounge for corporate members~~, the main hall and reception area, a boutique, fitness center, business and administration offices, and men's and women's locker rooms and lounges. ~~The members' area would include locker rooms, card rooms, a spa and members grill.~~ The lower level would contain the wine cellar and the storage area for bags and golf carts, and the upper level would include the staff locker rooms and lounge, meeting rooms and storage rooms. The pro shop would occupy a stand-alone structure to the east of the main clubhouse. In addition, a small conference center of approximately 6,000 square-feet may be added in the future if demand for meeting space warrants.

The clubhouse would be designed ~~in the style of an Italian hilltown,~~ in the California Regional style, and would take advantage of view opportunities from the base of the hillside. ~~The building would have an adobe type appearance and would be constructed with a building technique known as PISE (Pneumatically Compacted Stabilized Earth) instead of conventional frame construction. By this method the structure of the wall is created by spraying an earth mixture horizontally against a rigid, single thickness form to create walls 24 inches thick. Such massive walls provide excellent insulation for passive heating and cooling~~. The buildings follow the topography of the sloping foothills, and the complex has been arranged in a campus fashion as a series of low, interconnected structures and spaces that break down the perceived mass of the complex. The buildings are intended to harmoniously blend with the environment, and the layout and materials reflect this design objective. A series of natural gardens and terraces soften the appearance of the buildings and merge the interior with the exterior. The materials - stone, plaster, heavy timber, and slate complement the indigenous materials on the site, with the intent of further linking the buildings with their natural context.

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Overnight Accommodations

Adjacent to the clubhouse on the ~~hillside~~ west would be the 45 overnight guest units which would also be constructed in the ~~adobe~~ California Regional style, and would be laid out and designed as an integral part of the overall clubhouse complex (see Figures 10c and 10d). These units would not be typical hotel rooms and would only be available as overnight accommodations for golf course users.

The individual guest units would be approximately 500 to 600 square feet, and would be designed as suites. Some of the guest units would be arranged in clusters surrounding ~~several~~ five small conference rooms of approximately 500 square feet. ~~would be included in the overnight complex. These conference rooms would be located between the two units so they would be accessible from one or both of the adjacent units as needed.~~

Vehicular access to the overnight complex would only be by means of golf carts from the clubhouse ~~parking~~ area. The parking area for the clubhouse and overnight complex would have capacity for ~~188~~ 350 vehicles, with valet parking available from the clubhouse entrance. ~~parking for an additional 61 vehicles to be provided to the north of the clubhouse area adjacent to the practice facility.~~

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~~Equestrian Center~~ Horse Stables

The project would include a small stable where only residents of the project could keep their horses. The stable would be located in the northeastern corner of the site at the base of the easterly facing hillside (see Figure 9a) and would occupy a 1 to 2-acre site. The stable would have a floor area of up to 4,000 square feet and would provide space for up to 10 horses, a small area for hay storage, plus an adjacent corral. The stable would not

include any other facilities such as caretakers quarters, riding ring or paddock. The stable would have a simple rustic design to blend in with the rural surroundings. The stable would have driveway access off San Martin Avenue or would be accessible by foot along a path following the toe of the hillside southward to the on-site residential areas.

~~The project would include an equestrian center located on approximately 20 acres at the southeastern corner of the site with driveway access directly off Turlock Avenue. The equestrian center would be open only to project residents for the boarding of privately owned horses. No public horse rental is proposed. The focus of the equestrian center would be a covered riding arena structure measuring 100 by 200 feet. The arena would be surrounded on 3 sides by 20 to 30 indoor/outdoor stalls. The center would also include a hay storage area and living quarters for a caretaker/manager. Other features would include an outdoor riding ring, a training area/paddock and pasture. The access drive and 20 space parking area would be surfaced with all weather crushed gravel~~. The ~~center~~ stable would have direct access to over 8 miles of private riding trails proposed for the permanent open space areas of the Lion's Gate site. These riding trails would consist of a network of existing trails and vehicle tracks that occur throughout the site. Some minor improvements may be needed to these existing trails, but it is not expected that new trails would be created. ~~Access from the equestrian center to these trails would be via the narrow strips of permanent open space extending west and north of the equestrian center along the project boundary (see Figure 9c).~~

In order to prevent horse manure from entering downstream water courses or groundwater, the ~~equestrian facility~~ stable would be operated in accordance with a manure management plan, as required under Title 23, Chapter 15 of the California Code of Regulations (which pertain to the protection of water quality). Under the manure management plan, debris boxes would be used to store daily stall sweepings and manure. ~~The outdoor riding and pasture areas would have manure picked up daily with a special vacuum vehicle.~~ Disposal of wastes at a local landfill, one which is permitted to accept manure, would occur on ~~a daily basis or every other day~~ on an as-needed basis. ~~Alternatively, on-site composting of manure may be considered instead of off-site disposal. Any proposal to compost manure would require approval from the Department of Environmental Health Solid Waste Unit.)~~ The perimeter of the ~~equestrian center~~ stable site would be fenced to prevent animals from entering nearby drainages ~~and ponds~~ and contaminating the water.

~~The equestrian center would be contoured to direct on-site drainage to a grass swale or swales which would convey runoff to a lined retention pond or basin. This pond would be located at the eastern end of the site, just west of the landscaped berm proposed along Turlock Avenue. The pond would be equipped with a sump pump to remove any floating material, and would be cleaned out regularly to remove accumulated sediments. The pond would be sized for the 10 year storm to prevent overflow of accumulated drainage in all but the most significant flood events (the pond would be fenced to prevent entry, and signs would be posted warning people to keep out.) Any drainage from areas upslope of the equestrian center to the west would be directed around the facility to the proposed residential lake to the north.~~

The ~~equestrian center~~ stable would employ vector control measures as needed, such as baiting for flies, and rodent trapping. As discussed above, manure would be cleaned up daily and placed in debris boxes which would be emptied ~~daily or every other day~~ on an as needed basis and taken to a local landfill ~~or composted on-site.~~

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TYPICAL UNITS SOUTH ELEVATION

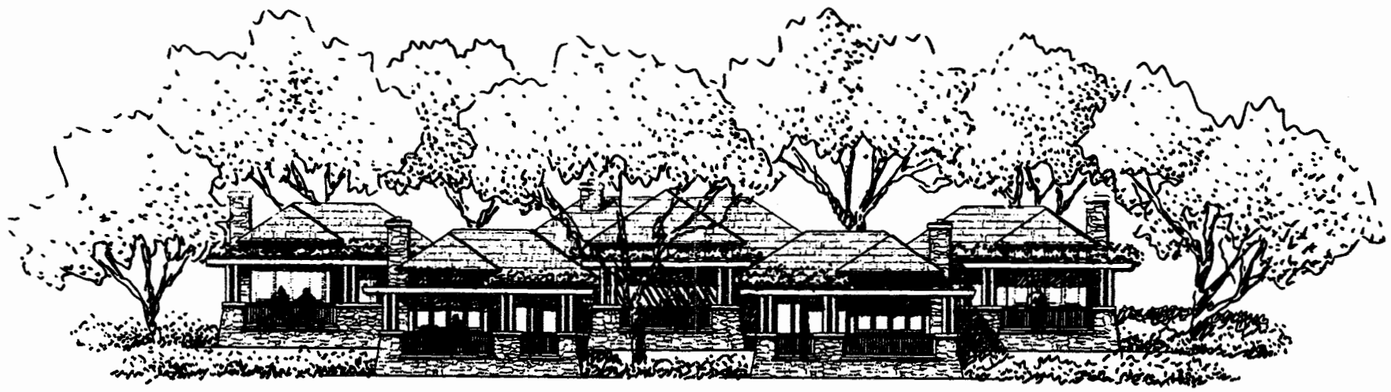
TYPICAL UNITS NORTH ELEVATION

TYPICAL UNITS EAST ELEVATION

OVERNIGHT UNITS - ELEVATIONS

Source: Backen & Gillam

FIGURE 10c



CONFERENCE SUITE SOUTH ELEVATION

CONFERENCE SUITE NORTH ELEVATION

CONFERENCE SUITE WEST ELEVATION

OVERNIGHT UNITS - ELEVATIONS

Source: Backen & Gillam

FIGURE 10d

Grading and Excavation

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Cuts and Fills

The total estimated earthwork for the project is approximately ~~one~~ 1.1 million cubic yards of cut and fill, of which approximately 760,000 cubic yards would be for the golf course. All earthwork would be balanced on the site.

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Excavations for Lakes

There are ~~four~~ five lakes, ponds and major detention basins proposed as part of the project. These include the following: the irrigation storage reservoir located at the west end of the golf course, which would involve excavation of ~~68,700~~ 63,350 cubic yards of earth; the runoff detention pond ~~near the 18th green~~ adjacent to the 11th hole, which would require removal of ~~7,950~~ 19,500 cubic yards; the wastewater storage pond ~~north of the driving range~~ adjacent to Turlock Avenue, which would entail the excavation of ~~69,000~~ 15,500 cubic yards of material; the 20-acre lake to be located at the main residential subdivision in the southeastern portion of the site, which would involve the removal of 70,200 cubic yards of earth; and the flood detention basin along Coolidge Avenue, which would involve the excavation of 30,000 cubic yards of material. The excess material generated by these excavations would be used in golf course contouring, constructing the berms along Turlock and Coolidge Avenues, and for building pads in the residential subdivisions.

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Drainage

The project largely incorporates the existing natural drainage system into the design of the golf course and residential areas. In the golf course plan there are several instances where short reaches of tributary drainages would be rerouted or piped to accommodate the fairway layout. Along the West Branch of Llagas Creek there are two locations upstream of the clubhouse site where small existing meanders would be removed in the golf plan. The natural drainage channels in the residential areas would be largely unaltered. The existing flow characteristics of West Branch Llagas Creek are not proposed to be altered in the proposed project plans. However, several flood control improvements are proposed which would reduce flooding potential on the project site as well as downstream. These include a diversion along the West Branch of Llagas Creek, a detention basin along Coolidge Avenue, and a lake/detention basin in the residential area south of Highland Avenue. These flood control features are described in Section *III. E. Hydrology and Drainage.*

Golf Course Drainage

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Some underground storm drains would be installed for the clubhouse and overnight complex. Surface runoff from the parking areas would be conveyed to ~~nearby retention basins~~ underground storm drains and conveyed to the main creek channel. The parking lot runoff would pass through an underground biofilter prior to discharge into the creek channel. ~~Stormwater collected in the basins would not be released to the creek channel but would percolate into the soil or evaporate. The retention basins would be cleaned of accumulated sediments as needed.~~

*

~~Equestrian Center~~

~~As noted previously, drainage within the equestrian center would be directed to a retention basin to be located at the eastern end of the site near Turlock Avenue. To the extent feasible, natural drainage originating upslope of the equestrian center would be diverted around the equestrian area and directed to the proposed lake to the north.~~

III. ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

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C. PARKS, RECREATION AND OPEN SPACE

Impacts and Mitigation

Impact 1. **The proposed golf course and residential uses would result in the loss of approximately ~~410~~ 434 acres of semi-natural open space. (Potential Significant Impact)**

The development of the golf course and its related facilities would involve ~~269~~ 277 acres of land in the central valley area of the site, while the residential subdivisions, ~~and~~ roadways, and the wastewater treatment facility would occupy approximately ~~141~~ 157 acres. Approximately 16 percent of the total site area would be converted to golf course uses, and ~~8~~ 9 percent would be converted to residential uses and public facility uses. This acreage consists primarily of fields, an abandoned orchard, grazing land and approximately 20 acres of partially wooded hillsides (although the proposed building envelopes for the two proposed woodland lots are located in areas with little or no tree cover.) The Hayes Valley site was identified as a low priority (rated #26 out of 42) for open space preservation by the County's Open Space 2020 Task Force. The report cited the property's value as watershed, viewshed, and ability to buffer urbanization as primary resources to be protected. The remaining ~~1,265~~ 1,242 acres of property would remain in permanent open space, as required under the Hillside clustering provisions of the zoning district.

Mitigation 1a. **The project would provide approximately ~~263~~ 258 acres of managed recreational open space in the form of a public golf course. The golf course would provide an added recreational opportunity in the County.**

The proposed project would provide additional recreational opportunities which would be open to members of the public. The project would help alleviate the well-documented shortage of golf courses in the County.

Mitigation 1b. **The remaining ~~1,265~~ 1,242 acres of natural and semi-natural area of the site would be preserved as permanent open space as a condition of the cluster development permit.**

Approximately ~~1,265~~ 1,242 acres of oak woodland and grassland on the site would be preserved as permanent open space. This open space would be managed and maintained by the Homeowners Association for the project, and would not be open to the general public.

D. GEOLOGY AND SOILS

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Impacts and Mitigation

Impact 1. **Potential secondary ground rupture or sympathetic movement along inactive faults crossing the site may result in minor damage to structures, roadways and utility lines. (Potential Significant Impact)**

The previous limited fault investigation on the Hayes Valley site by Wahler Associates in 1990 concluded that both of the on-site fault traces are inactive. This was confirmed through exploratory borings and trenching performed by Twining Laboratories in May 1998. Therefore, the potential hazard due to primary ground rupture (as might occur along an active fault trace) is considered minimal at the project site. Secondary ground rupture or *sympathetic movement* along one of the inactive faults on-site could conceivably occur as the result of the strong groundshaking caused by the occurrence of a large earthquake originating on one of the nearby active faults (e.g., Sargent or San Andreas faults). In the event of a large earthquake nearby, sympathetic movement of a fault within bedrock materials at depth might propagate through the overlying sediments to the break the ground surface; but where bedrock covers significant thickness (more than 5 feet) of alluvium or colluvium, displacement at the ground surface would be considered unlikely, although broad tilting and deformation are possible. Any displacements at the surface of the bedrock from such sympathetic fault movement would likely be small, up to a maximum of several inches. The risk of minor damage to structures, roadways and utility lines crossing the on-site fault traces as a result of secondary ground displacement is negligible, but remotely possible. However, dissimilar earth materials may be juxtaposed across the fault, or structurally weak zones of sheared rock may occur coincident with the faults. Such variable foundation properties can result in excessive differential settlement, and damage may occur to buildings constructed across such zones. The areas of the project that could be potentially affected by on-site fault traces include the site of the clubhouse/overnight complex and proposed Lots 7 through 11, 20 through 24, and 30 and 31 (see Figure 11). ~~The clubhouse and overnight accommodations complex would not be affected.~~

Mitigation 1a. **Where proposed structures for human occupancy are determined to be underlain by an inactive fault trace, mitigation could consist of modification of the soil foundation, using deep foundations, or modifying the location of the structure away from the shear zone.** ~~**Appropriate setback distances for those structures may be required.**~~

~~Detailed fault investigation would be undertaken where structures for human occupancy are planned for areas suspected of being underlain by faults. These studies would determine the potential for surface displacement along the on-site fault traces, with implementation of recommendations as to appropriate measures for site planning, building design, and utilities engineering. The previous fault study (Wahler, 1990) was relatively general and did not address specific proposed building sites.~~

Potential differential settlement in the vicinity of the fault traces may be mitigated by overexcavation and recompaction of foundation soils across the fault, or by deep foundations such as drilled shafts or driven piles. In addition, mitigation may include

modifying the location of the structure away from the shear zone. Specific foundation recommendations will be made by Twining Laboratories in the design level geotechnical engineering report.

~~Based on the findings of such explorations, the project geologist could recommend that habitable structures be located off the faults, or in the event of potential sympathetic movement, that a setback zone be established. An appropriate setback distance would be established in discussions between the County Geologist and the project geologist. There is adequate space on all of the proposed lots to accommodate any changes in building locations. Alternatively, the project geologist may conclude that there is no risk of offset along the fault contacts due to the thickness of alluvium, indicating no need for mitigation or avoidance.~~

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Impact 5. **The presence of unstable slopes and existing landslide deposits on the project site may pose a hazard to proposed structures, and may be affected by project grading. (Potential Significant Impact)**

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~~In addition, the spray irrigation of the practice range with treated effluent, which is proposed as an alternative wastewater disposal method, could destabilize existing slide deposits in this area by increasing pore pressures within the slide masses.~~

~~Due to concerns about potential landsliding affecting the feasibility of the proposed overnight units, and Lots 24, 25 and 26, feasibility level geotechnical evaluations of these areas were conducted by Pacific Geotechnical Engineering in December 1995. With respect to the overnight units, it was found that two landslide deposits located upslope of the complex could become reactivated and impact the proposed structures. It was concluded that, while further design level geotechnical studies would be required, it appears that this landslide hazard "can be mitigated or repaired in conventional fashion without exorbitant cost" (see mitigation measures below). (The feasibility report on the clubhouse and overnight complex is contained in Appendix C.)~~

There are two landslide features to the north of the clubhouse/overnight complex which appear to comprise relatively shallow rotational block slides and slumps. These slides are separated from the complex by a ravine which would preclude impact to the complex if the landslide masses were remobilized. As such, the slide masses do not present a hazard to the complex.

E. HYDROLOGY AND DRAINAGE

This discussion is mainly based on the following reports: Hydrology and Drainage - Lion's Gate Development prepared by Schaaf & Wheeler in November 1995; and the ~~Preliminary Design Report for the~~ Lion's Gate Reserve Master Drainage Plan prepared by Pacific Advanced Civil Engineering in ~~November 1996~~ January 1998 (with an addendum dated April 1998). ~~Both of~~ These reports are contained in Appendix D of this EIR.

Environmental Setting

Area-Wide Drainage

The project site is located in the Llagas Creek watershed which drains from the eastern slopes of the Santa Cruz Mountains and the western slopes of the Mount Hamilton Range south to the Pajaro River and Monterey Bay near Watsonville. The major tributaries of Llagas Creek are Little Llagas Creek, Madrone Channel, Coralitos Creek, San Martin Creek, Church Creek, and West Branch Llagas Creek. Llagas Creek and its tributaries drain a total of approximately 105 square miles upstream of its confluence with the Pajaro River south of Gilroy.

The climate of the south Santa Clara Valley is similar to that of the San Francisco Bay Area. Summers are warm and dry while winters are mild and moderately wet. Nearly 90 percent of the annual rainfall occurs in the late fall or winter months, with January normally being the wettest. The mean annual precipitation varies within the Llagas Creek watershed from a high of over 50 inches in the Santa Cruz Mountains to a low of 14 inches on the valley floor. The basin-wide average is approximately 20 inches per year.

Stream flows in Llagas Creek are regulated by Chesbro Reservoir, which is owned and operated by the Santa Clara Valley Water District. The reservoir has a total storage capacity of approximately 8,100 acre-feet. The reservoir is operated for water supply purposes, but does provide some incidental flood control benefit due to peak flow attenuation.

The upland areas of the Llagas Creek watershed have soils developed on sedimentary rock, basic igneous rocks and serpentine rocks. The main soils are of the Los Gatos, Gaviota, Vallecitos and Haymen associations. They range in depth from shallow to deep, and are located on steep to very steep slopes. The vegetative cover includes grasses, oak, pine, brush and hardwoods. The infiltration rates of water in the upland areas is generally slow. The upland soils are classified as having a high to very high erosion potential.

The upland portions of the Llagas Creek watershed have very little development at this time, and the County General Plan calls for only limited development in the future with mostly open space. On the valley floor, most of the Llagas Creek channel and its tributaries are leveed or perched channels with channel banks higher than adjacent areas on one side or both sides of the stream channel. Therefore, overflows from the channel tend to flow away from and parallel to the channel.

Based on information from the Federal Emergency Management Agency (FEMA) Flood Insurance Study for Santa Clara County, there are extensive areas of floodplain from Llagas Creek and its tributaries. The most serious of these are within the City of Morgan Hill from West Little Llagas Creek, and in the City of Gilroy from West Branch Llagas Creek.

The Santa Clara Valley Water District and the Soil Conservation Service have completed a flood control project for the Llagas Creek watershed. The downstream reach from Bloomfield Road to the Ronan Channel

has been improved to 100-year design standards, and the reach from the Ronan Channel to Route 101 has been improved to 10-year design standards. In addition, 100-year design channels have been provided in the urban areas of Morgan Hill and Gilroy. Improvements in Gilroy included diversion of West Branch Llagas Creek to the Ronan Channel, and channel improvements upstream to Day Road. The project was designed to eliminate most flooding in Gilroy south of Day Road. This project has been completed, and FEMA is in the process of changing the Flood Insurance Rate Maps for this area.

Site Drainage and Flooding Conditions

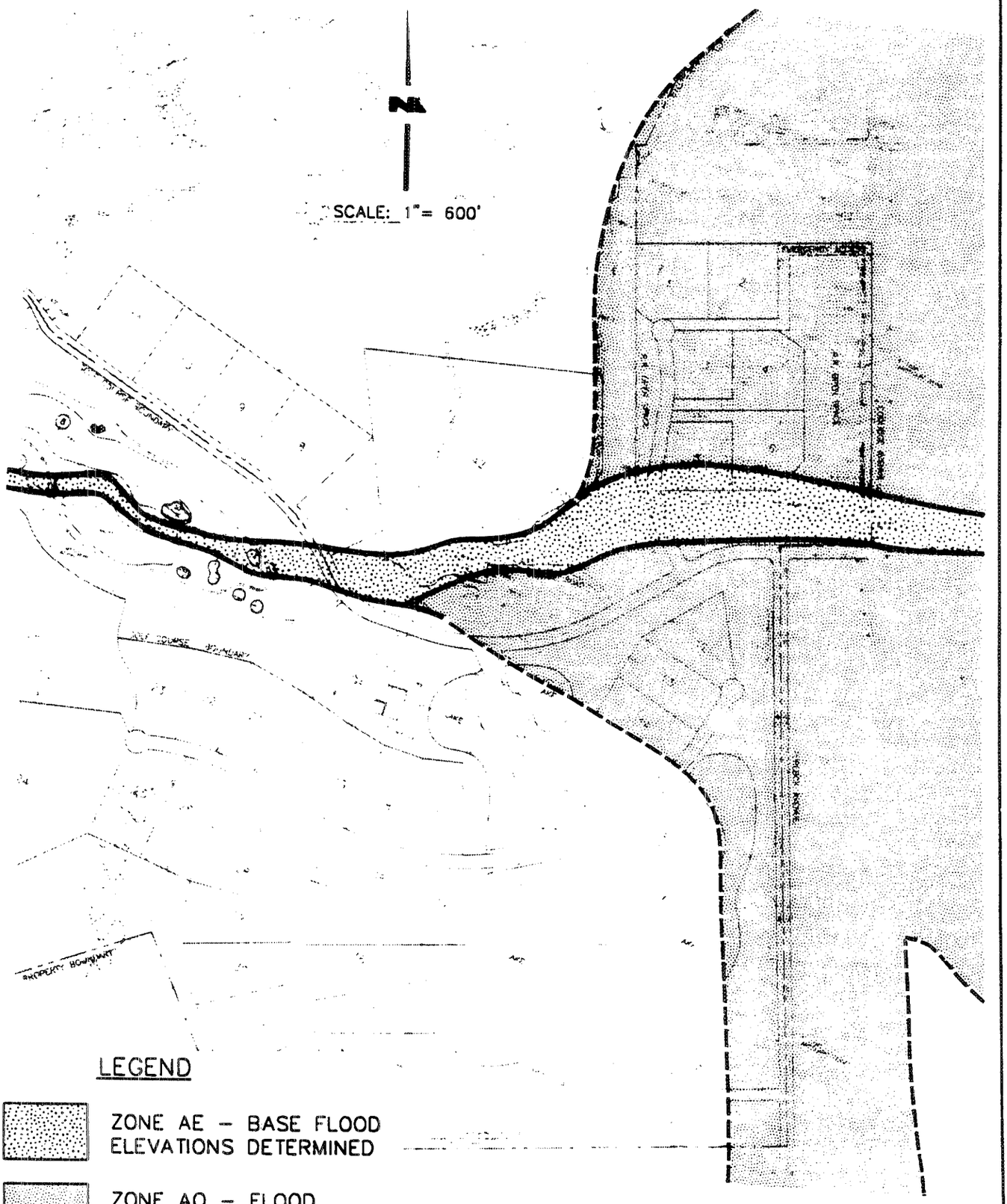
The project site drains to two separate drainages. The western portion of the site drains to the west to Hayes Creek near Watsonville Road while the majority of the site drains via the east to the West Branch Llagas Creek. A network of intermittent and ephemeral streams flow from the higher elevations on the perimeter of the central valley into the West Branch of Llagas Creek. The Creek has 8 primary tributaries, 4 of which drain the hills north of the valley and with the other 4 originating on the southern ridgeline. These tributary streams flow during winter and spring months for varying periods and are dry the remainder of the year. West Branch Llagas Creek discharges to the Ronan Channel which joins Llagas Creek near Highway 152 east of Gilroy. Hayes Creek drains to Llagas Creek near Watsonville Road, south of Morgan Hill. The are no detailed floodplain studies for Hayes Creek. The area is designated as Zone D on the Flood Insurance Rate Map. Zone D is defined as an area of undetermined flood hazard.

As flows in West Branch Llagas Creek reach the eastern project boundary at Coolidge Avenue, they pass under the road through a 3.5' x 6' concrete box culvert. Since the culvert is relatively small compared to the incoming 100-year flow, the creek backs up submerging the culvert and overtopping the northern bank of the channel and flooding the orchard located just north of the channel. As the flow ponds up in the orchard, it crosses Coolidge Avenue at a dip section located approximately 1,200 feet north of the creek. The dip section in the road has a 24-inch reinforced concrete pipe culvert to convey the smaller nuisance flows under the road.

At the southeast corner of the site, ground elevations are low resulting in natural drainage flows toward this corner of the site. As the flows pond up in the corner they enter a 16-inch corrugated metal pipe which conveys the flows from the project site to the adjacent property to the south. The flows then enter two 12-inch pipes that convey the flows under Turlock Avenue to the east. Since the 100-year flow in this area is 161 cfs, which is more than the capacity of the pipes, the road is overtopped at the nearby low point or dip section in the road.

The Flood Insurance Rate Maps for West Branch Llagas Creek do not include detailed floodplain studies upstream of Golden Gate Avenue, approximately 2 miles south of Highland Avenue. The stream channel on the project site is designated as Zone A, approximate 100-year floodplain. At Turlock Avenue, the floodplain is shown as approximately 300 feet wide along the channel north of Highland Avenue.

West Branch Llagas Creek has been restudied by FEMA to update the existing Flood Insurance Rate Maps. The draft work maps are currently in the review process and are not expected to be become effective until late 1996. The SCVWD is using the revised maps as the best available information in the interim. The proposed 100-year floodplain for West Branch Llagas Creek near Highland Avenue is significantly larger on the revised maps than on the current maps. The proposed floodplain includes shallow flooding from the channel commencing at the ranch complex on the project site and including the area south of Highland Avenue, west of Turlock Avenue, and the area north of Highland Avenue west of Coolidge Avenue (see Figure 13).



100-YEAR FLOODPLAIN

FIGURE 13

The hydrology for the detailed floodplain study shows an estimated 100-year peak flow rate of 850 cubic feet per second for West Branch Llagas upstream of Turlock Avenue. An estimated 400 cfs overflows Highland Avenue toward the south upstream of Turlock Avenue. An additional 355 cfs overflows from the channel toward the north upstream of Coolidge Avenue. The northern overflow crosses Coolidge Avenue north site and flows overland to the east and south to the West Branch Llagas Creek channel at Highland Avenue. The majority of the overflow to the south flows overland to the south and east and crosses Turlock Avenue to rejoin the West Branch Llagas Creek floodplain between Highland Avenue and Golden Gate Avenue. A portion of the overflow continues south along the west side of Turlock Avenue.

A more detailed floodplain study was undertaken for the project by Pacific Advanced Civil Engineering in conjunction with preparation of the Master Drainage Plan for the project in January 1998. This floodplain study was based on detailed topographic mapping and ground surveying of the site and adjacent roadways. Therefore, the findings of this study are considered to be the best available information on flooding potential for the project site. This floodplain study estimates the 100-year peak flowrate leaving the eastern edge of the site to be 1,068 cubic feet per second. This includes 797 cfs that overflows the channel of West Branch Llagas Creek east of Coolidge Avenue and north of Highland Avenue, 110 cfs that flows through the culvert at Coolidge Avenue, and 161 cfs that overflows Turlock Avenue in the southeast corner of the site. According to this study there would be no extensive sheet flooding across the eastern portions of the site during the 100-year event, as shown in Figure 13, except for the ponding within 200 feet of Coolidge Avenue north of Highland Avenue and in the extreme southeast corner of the site.

Ordinances and Regulations that Address Drainage and Flooding

County Drainage Manual: This manual contains guidelines for design and installation of drainage facilities for projects. Projects must demonstrate that drainage will be handled adequately in order to avoid drainage and flooding problems. These guidelines ensure that there are no on- or off-site drainage problems associated with a project.

Grading Ordinance: The ordinance requires that all drainage structures and devices be consistent with the adopted County Drainage Manual and its standards. It outlines disposal requirements for both on- and off-site drainage; provides for slope protection and erosion control; and the design of dikes, swales and ditches.

Land Development Regulations: The County Land Development Engineer reviews all projects to ensure no on- or off-site drainage impacts would occur as a result of the proposed project.

Zoning Ordinance: For projects requiring a use permit, Section 47-5(d) of the Zoning Ordinance ensures that adequate storm drainage exists or shall be provided as a part of the project; and that no on- or off-site drainage impacts would result from the project.

Special Flood Hazard Area Ordinance: This ordinance applies to all areas of special flood hazard (i.e., within the 100-year flood zone as established by FEMA) within the unincorporated area of Santa Clara County. No new development shall occur, or structure or improvement shall be constructed in a flood zone without compliance with this ordinance.

Significance Criteria

With respect for flooding and drainage impacts, Appendix G of the CEQA Guidelines states that a project will normally have a significant effect on the environmental if it will: "(g) Cause substantial flooding, erosion or siltation."

Impacts and Mitigation

Impact 1. **The project would potentially result in increased downstream flooding during the 100-year, 10-year, and more frequent storm events. (Potential Significant Impact)**

The proposed residential development on the project site would increase the amount of impervious area on the site and therefore increase the runoff from the site.

The cluster residential development area south of Highland Avenue would be served by storm drains which would discharge to the 20-acre lake proposed for the main subdivision area. The overflows from the lake would discharge via storm drains to West Branch Llagas Creek upstream of Coolidge Avenue. In addition, there are approximately 73 acres of hillside area upstream of this residential development area. Drainage from this area would also be collected by the storm drain system and discharge to the lake. The total area of this drainage area is approximately 240 acres.

The golf course would also be located entirely within the West Branch Llagas Creek watershed which drains to the east. There would be no development in the western portion of the site which drains to the west to Hayes Creek. The West Branch Llagas Creek watershed upstream of Turlock Avenue is approximately 1,060 acres or 1.66 square miles. The golf course development would include approximately 240 acres, the majority of which would be landscaping and turf. The upstream hillside areas would not be affected. The existing creek channel and pond would be largely maintained in their existing configurations. A new pond would be constructed west of the existing pond to serve as an irrigation water reservoir and to detain runoff from the undeveloped area upstream. The new pond would include approximately 9 acre-feet of detention storage.

To analyze potential drainage and flooding impacts, the project site was divided into the following 3 drainage areas: the cluster residential subdivision south of Highland Avenue; the area upstream of the existing pond; the area upstream of the proposed new irrigation reservoir; and the area downstream of the pond golf course reservoir. Discharge rates were estimated for the 10-year and 100-year storms for existing and project conditions.

The results of the flooding analysis show that the proposed golf course would reduce the flow from the site to West Branch Llagas Creek. The golf course would decrease the estimated peak runoff from the watershed because the proposed irrigated turf would maintain a dense layer of thatch which would act as a sponge and reduce runoff, whereas the existing unirrigated range grasses tend to be sparse, with exposed dirt between grass clumps, which does not retain as much runoff. The estimated 100-year peak flow from the golf course area would decrease from 780 cubic feet per second to 765 cubic feet per

second, a decrease of 2 percent. The 10-year peak flow rate would decrease from 375 cubic feet per second to 360 cubic feet per second, a decrease of 4 percent.

The proposed golf course irrigation reservoir would also act as a detention facility to reduce the estimated peak flow rate from the western portion of the watershed. For purposes of analysis, the existing pond was assumed to be full at the start of the storm and to have minimal effect on the flood hydrograph. The proposed irrigation reservoir was assumed to be full to spillway elevation at the start of the storm, and to have a 12-foot wide spillway. The estimated storage capacity of the pond is 9-acre-feet with 3 feet of flow over the spillway. The detention storage in the irrigation reservoir would reduce the estimated 100-year peak flow at the pond from 59 cubic feet per second to 39 cubic feet per second, a reduction of 20 cubic feet per second. However when routed downstream and combined with the larger watershed downstream, the detention storage reduces the peak by approximately 10 cubic feet per second. This is due to the difference in timing between the peak flow in the upper watershed and the lower portion of the watershed. The peak flow from the upper watershed is delayed by the travel time along the creek channel and arrives after the peak from the lower watershed. Therefore the peaks do not add directly. The detention storage in the upper watershed acts to increase the timing difference of the upper watershed.

The proposed golf course grading would also include local detention areas to contain runoff from the turf areas for water quality purposes. These would also act to reduce runoff from the site, particularly for small storms. The effect of these detention areas on larger storms would depend on the design and placement of each area and whether the upstream hillside areas would drain to the detention areas or directly to the creek. Therefore, the effects of potential detention storage on the golf course other than the larger pond were not considered in the hydrograph analysis.

The flooding analysis indicated that the proposed cluster residential development would result in a potential increase in the peak runoff from the development site. The 100-year peak flow from the entire watershed would increase from 236 cubic feet per second to 301 cubic feet per second, an increase of 28 percent. The 10-year peak flow rate would increase from 120 cubic feet per second to 160 cubic feet per second, an increase of 33 percent. The increase in peak runoff is due to both the increased impervious area in the development, and the more efficient drainage system which collects runoff faster than the existing overland flow conditions.

~~However, the cluster residential subdivision would include a proposed lake, and runoff would be drained to the lake, then released to West Branch Llagas Creek. Only the proposed equestrian center in the southeastern corner of the site would be below the lake elevation and would drain toward Turlock Avenue. There is no storm drain system along Turlock Avenue, but runoff flows along the road under existing conditions.~~

~~The residential cluster subdivision is located in a drainage area of 240 acres, which would drain to the proposed lake. Without the lake, increased peak runoff from the cluster residential subdivision would potentially increase the peak flow in West Branch Llagas Creek downstream of the project.~~

Mitigation 1. ~~The on-site lake proposed for the southern residential cluster subdivision would be designed to provide sufficient detention storage for increased peak runoff resulting from site development. In addition, a diversion structure would be constructed in the creek channel to divert a substantial portion of storm flows exceeding existing 10-year flow rates to the residential lake, which would be sized to accommodate about one-half of the flows from the 100-year event. With these facilities, the peak flow rates leaving the project site during significant storm events would be substantially lower than under existing conditions.~~ **In order to control and detain flood flows generated at the site, a diversion channel, a detention basin and a lake are proposed. These structures would be designed to minimize the extent of flooding within the project boundaries, and would reduce peak flood flows leaving the site during the 100-year, 10-year, and 2-year events relative to existing conditions.**

~~The potential increased runoff from the residential area during the 100-year event would be 65 cubic feet per second, without the proposed lake. The proposed lake would have a normal water surface elevation less than the top of bank elevation of West Branch Llagas Creek at the outfall from the pond. The diversion structure in the creek would be designed such that a substantial portion of the flows in the creek less than the existing 10-year peak flow would pass under the structure and would not be able to enter the side channel to the lake. Flows exceeding the 10-year peak flow would be blocked by the structure and diverted to the lake for temporary storage (see Figure 13a). This would reduce the 100-year flow rate leaving the site from approximately 800 cfs under existing conditions to approximately 400 cfs. This substantial reduction in flood flows leaving the site would significantly reduce flooding problems along the West Branch of Llagas Creek downstream of the site. However, there still would be overland and downstream flooding during the 100-year event, but the extent and volume of flooding would be reduced as a result of the proposed diversion and storage. Once the storage capacity of the lake is reached, any additional flows would be prevented from entering the lake. Instead, these extreme flood flows would be allowed to overspill the creek, as would occur under existing conditions. The outflow from the lake would only occur when the water level in the creek is low. Therefore, the outflow from the pond would not contribute to the existing flood problems from the creek channel.~~

~~Since the residential lake would be sized to contain a substantial portion of the 100-year peak flow, the shallow flooding that occurs along the Turlock and Coolidge Avenue frontage areas of the site during the 100-year event would be significantly reduced (see discussion under 'Impact 2' below).~~

~~The equestrian center area in the southeast portion of the project site would not drain to the pond in the residential development area. Due to the site topography, there would be a berm between the equestrian center and the pond to contain the pond. The maximum height of the berm would be approximately 7 feet. The equestrian center would continue to drain to Turlock Avenue and ultimately to West Branch Llagas Creek. Because of the limited impervious area associated with the equestrian center, there should be no increase in runoff from the area after the project. In addition, the proposed equestrian center would include a detention pond for water quality purposes.~~

The main flood control features include a diversion channel to be constructed along the West Branch of Llagas Creek, a detention basin along Coolidge Avenue, and a

lake/detention basin in the residential area south of Highland Avenue. These features are shown in Figure 13a and described below.

Diversion Channel along West Branch Llagas Creek

To eliminate flooding along the banks of the creek at the eastern end of the project, a diversion channel is planned to run parallel and south of the existing creek channel. The new channel would branch southward off the existing channel at a point just west of the roadway ('A Street') for the Rural Residential subdivision where it crosses the existing creek channel. The diversion structure would consist of a spillway 75 feet in length. Flows to the existing creek channel would be limited by two 24-inch reinforced concrete pipes that would serve as culverts under 'A Street'. This would serve to divert the major portion of the flood flows to the new parallel channel. The diversion channel would be trapezoidal with a 10-foot bottom width, and would be grass lined. The diversion channel would rejoin the main channel at a point just west of Coolidge Avenue. The existing creek channel would not be altered.

Detention Basin Along Coolidge Avenue

Since the existing culvert at Coolidge Avenue does not have sufficient capacity to convey larger storm events, flooding occurs to the north in the orchard along Coolidge Avenue with flood flows crossing eastward over the roadway at a low point approximately 1,200 feet north. To control this on-site flooding and to reduce flooding over Coolidge Avenue, a 5.5-acre detention basin is planned adjacent to the roadway. The detention basin would be approximately 200 feet wide and 1,000 feet long and have a storage capacity of 23 acre-feet. Flood flows would enter the detention basin at a spillway alongside the creek channel near Coolidge Avenue. Once the detention basin is filled, it would overflow at the northeast corner where flood flows would cross Coolidge Avenue at the low point or dip section. The detention basin is not intended to eliminate flooding altogether, but it would significantly reduce flood flows crossing the dip section of the roadway relative to existing conditions (see Table 4a). The flow reduction is greatest for the 2-year event, which would undergo a reduction of 63 percent as a result of these improvements.

Lake/Detention Basin South of Highland Avenue

The 20-acre lake planned for the residential area south of Highland Avenue would be designed to provide 50 acre-feet of flood storage during major storm events. Drainage from the adjacent residential area and the tributary area in the hills to the west would be conveyed to the residential lake. Once the lake has reached capacity, flows would enter a swale at the south end of the lake which would convey flows to the southeast corner of the site. Overflows from the swale would cross Turlock Avenue at a low point or dip section in the roadway as occurs under existing conditions. However, the flood flows crossing the dip section would be significantly reduced for all major storm events, relative to existing conditions (see Table 4a). The flow reductions are greatest for the 10-year and 2-year events, which would undergo reductions of 62 percent and 81 percent, respectively, as a result of these improvements.

TABLE 4A

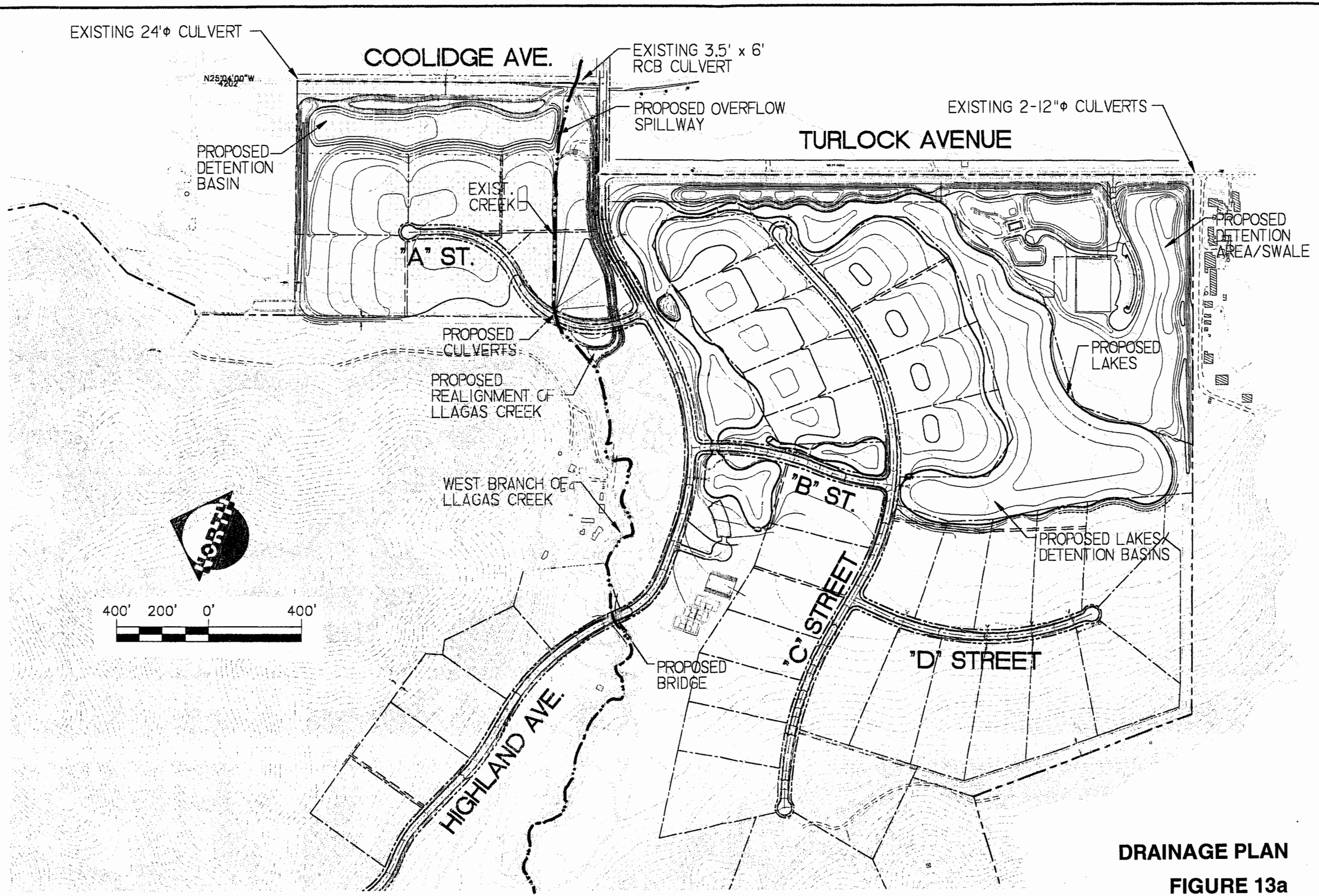
COMPARISION OF FLOOD FLOWS LEAVING THE SITE FOR THE EXISTING AND DEVELOPED CONDITIONS

	Existing Condition Flow (cfs)	**Developed Condition** Flow (cfs)	**Percentage Flow Reduction**
Coolidge Ave. Dip			
100-year	797	753	6%
10-year	332	294	11%
2-year	86	32	63%
Turlock Ave. Dip			
100-year	161	128	20%
10-year	73	28	62%
2-year	31	6	81%

Impact 2. **Portions of the residential cluster subdivisions ~~would~~ may be subject to shallow flooding (one foot average depth) during a 100-year event, and the proposed dwellings could also potentially obstruct this sheet flow through the site. However, the total area of the site that may be subject to shallow flooding would be reduced by flood control improvements included in the project. (Potential Significant Impact)**

Based on the revisions to the existing Flood Insurance Rate Map, shown in Figure 13, the West Branch Llagas Creek would overflow to the south upstream of Turlock Avenue (i.e., at the on-site ranch complex). For the 100-year flood, the FIRM shows that approximately 400 cubic feet per second would cross through the northeastern portion of the cluster residential development, in particular through Lots 12, 13 and 14 at the northeast corner of the subdivision. This mapped overflow crosses the site and Turlock Avenue to rejoin West Branch Llagas Creek 500 to 1,000 feet downstream of Highland Avenue. The overflow is indicated as shallow flooding with an average depth of one foot, indicating that the proposed lots would be prone to flooding. In addition, grading for the residential lots in the overflow area could adversely affect the sheetflow through the area if the flow is obstructed. Similarly, grading for the access road the project and landscaping along Turlock Avenue could affect the sheetflow across the site.

The revised flood maps also show an overflow to the north from West Branch Llagas Creek upstream of Coolidge Avenue. For the 100-year flood, approximately 355 cubic feet per second would cross through proposed the rural residential development north of Highland Avenue and west of Coolidge Avenue. The overflow would flow overland to rejoin West Branch Llagas Creek at the culvert under Highland Avenue. Part of the overflow is designated as shallow flooding with an average depth of one foot, and a small sliver along the north boundary is indicated for flood depths of 0.5 to 2.5 feet. All six of the 5-acre lots are within the mapped 100-year floodplain area and thus would be prone to flooding. Also, grading for the residential lots and cul-de-sac in the floodplain could have an adverse affect on the sheetflow if flow is obstructed.



DRAINAGE PLAN

FIGURE 13a

TITLE: PROPOSED SITE DRAINAGE

JOB: LION'S GATE RESERVE

SANTA CLARA CO., CA.

SCALE	1"= 400'
DESIGNED	J.I.G.
DRAWN	J.I.G.
CHECKED	M.E.K.
DATE	2/13/98
JOB NO.	6785-E

PACE
PACIFIC ADVANCED CIVIL ENGINEERING
17802 GEORGETOWN LANE, HB, CA 92647
(714) 843-3734 FAX 848-4820

PATH:

Both the area subject to potential sheet flooding and the volume of flood water spilled would be substantially reduced by the flood diversion and storage facilities described under 'Mitigation 1' above. The Coolidge detention basin, the residential lake would detain the increment of runoff generated by the project in addition to ~~approximately 400 cfs~~ a portion of the peak flow during the 100-year event (see Table 4A above)., ~~which would represent approximately one-half of the overland flows overspilling the creek west of Coolidge/Turlock Avenues on the project site during the 100-year event. The precise reduction in flood plain area would be calculated in conjunction with the preparation of the Final Master Drainage Plan for the project.~~

As noted under 'Environmental Setting', a more detailed floodplain study was undertaken for the project by Pacific Advanced Civil Engineering in conjunction with preparation of the Master Drainage Plan for the project in January 1998. This floodplain study was based on detailed topographic mapping and ground surveying of the site and adjacent roadways. Therefore, the findings of this study are considered to be the best available information on flooding potential for the project site. According to this study there would be no extensive sheet flooding across the eastern portions of the site during the 100-year event, as shown in Figure 13, except for the ponding within 200 feet of Coolidge Avenue north of Highland Avenue and in the extreme southeast corner of the site.

Mitigation 2. **Potential impacts to the residential subdivisions from shallow flooding would be mitigated by constructing building pads on fills raised above flood elevations. The potential obstruction of sheetflows by the proposed development would be mitigated by balancing fills with cuts within the flood-prone areas.**

The potential impact of placing a portion of the proposed residential development within the 100-year floodplain areas, as shown on the revised Flood Insurance Rate Maps, would be mitigated by balancing the grading within the 100-year floodplain. This would mean that fills required to elevate building pads above flood elevations would need to be balanced by cut areas to allow flood flows between the buildings. This procedure is generally most effective in shallow flooding areas with limited building coverage as in the proposed project. If the buildings cover a large percentage of the floodplain and are in deeper flood area, and effective balance between cut and fill would be problematic. For instance, if a building obstructs 50 percent of the floodplain in 3 feet of flood depth, the building pads would have to be elevated 3 feet, and the remainder of the floodplain would have to be excavated 3 feet to balance the cut and fill. This would lead to an elevation difference of 6 feet between the building pads and the adjacent ground. In the proposed project, the building densities would be very low with 2- to 3-acre residential lots. Thus, building elevations of 1 to 2 feet above existing grade would become 2 to 3 feet or less above the new ground elevations because of the larger area available to balance the fill.

In addition, the frontage berms proposed along Coolidge and Turlock Avenues would include sufficient breaks within the flood-prone sections such that the direction of sheet flow during major storm events would not be altered relative to existing conditions.

Although the most recent floodplain study undertaken by Pacific Advanced Civil Engineering in conjunction with the Master Drainage Plan indicates that the eastern portions of the would not be subject to extensive sheet flooding during the 100-year event, the building pads for the dwellings will be above the flood elevations shown on the revised Flood Insurance Rate Maps.

Conclusion. **With implementation of the above mitigations as proposed in the project, the potential flooding impacts of the project would be reduced to less-than-significant levels.**

F. WATER QUALITY

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Impacts and Mitigations

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Impact 3. **The project would generate urban nonpoint pollutants which may be carried in stormwater runoff from paved surfaces to downstream waterbodies. (Potential Significant Impact)**

The introduction of traffic and parking areas would increase accumulated hydrocarbon byproducts and heavy metals from automobiles, which would be flushed into drainages and streams. At the maintenance facility, washwater, lubricants and hazardous materials may be generated. Unless controlled, these urban pollutants would contribute to cumulative nonpoint contaminant loads in downstream drainages and waterbodies.

Mitigation 3. **The project would include stormwater controls at the parking lots and maintenance facilities.**

Sheet flows over the clubhouse ~~and practice range~~ parking lots would be collected and ~~piped to nearby stormwater retention basins. The collected runoff would not be discharged into the West Branch Llagas Creek, but would percolate into the soil or evaporate. The retention basins would be cleaned of accumulated sediments and debris as needed~~ conveyed to the underground drainage system for the golf course. Prior to discharge into the main creek channel, the parking lot runoff would pass through a biofilter consisting of cobbles and gravel to remove sediments and debris.

J. VISUAL AND AESTHETICS

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Impacts and Mitigation

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Impact 1. **The project would result in visual changes to some areas of the site open to public view. (Potential Significant Impact)**

As discussed under 'Environmental Setting' above, the most visually accessible areas of the site are located along Coolidge Avenue (Santa Teresa Boulevard) and Turlock Avenue at the eastern end of the site, and along Watsonville Road to the west. The interior valley area of the site is not visible from off-site vantage points except for the single home that overlooks the site from the northern ridge. The hillside areas nearest to the flanking roadways are also visible.

The residential subdivisions proposed for the eastern end of the site would be partially visible from adjacent land uses and roadways. In the Rural Residential subdivision proposed adjacent to Coolidge Avenue, north of Highland, the 6 proposed lots would be set back from the roadway at least 300 feet toward the adjacent hillside to the west. The setback area would remain as permanent open space, with a landscaped berm ~~and a planted vineyard~~ providing visual screening for these lots. A stormwater detention basin would occupy the open space area between the roadside berm and the residential lots; however, the basin would be entirely screened from the roadway by the intervening landscaped berm.

The residential cluster subdivision proposed for the field west of Turlock Avenue would also be partially visible to passing motorists. However, this subdivision would be set back 200 feet to 1,400 feet from the roadway, and would be screened by the landscaped berms planted with black walnut trees. Nevertheless, the roof lines of the nearest dwellings would be visible from Turlock Avenue and Santa Teresa Boulevard, at least until the black walnuts have matured enough to provide more complete screening (see Figure 16). Since two of the proposed lots (Lots 24 and 25) extend into the adjacent hillside area, it is possible that future custom homes to be built on these lots may be visible from Turlock Avenue and Santa Teresa Boulevard.

The small horse stable planned for the northwest corner of the site would be sited in a small side valley along the toe of the eastern hillsides. The nearest existing land uses include a nursery business located approximately 500 feet east and two single-family dwellings located approximately 800 feet to the northeast and the southeast. The existing nursery with its dense boundary landscaping almost completely screens the stable from view of Coolidge Avenue and the residences in the vicinity.

The package wastewater treatment plant and residential lake occupy the area between the roadside berm and the residential subdivision. However, these project components would be low in profile and almost completely shielded from view by the landscaped berm along Turlock Avenue.

The only other visual changes that would occur at the eastern end of the site would be the roadway improvements and entry features along the Highland Avenue entry way. However, any improvements would be subject to Architecture and Site Approval to ensure that signs, fences, lighting and other features would be compatible with their surroundings. Also, the existing mature landscaping trees around the ranch complex would be retained and incorporated into the project.

From Watsonville Road to the west, very little of the project, if anything, would be visible. All of the area with ¾ mile of the roadway is proposed to be maintained as permanent open space. The golf course would be located to the east of the low saddle that crosses the western portion of the valley, and thus would not be visible from Watsonville Road. It is possible that the maintenance facility proposed for the western end of the golf course may be partially visible from Watsonville Road, ¾ mile to the west. The only evidence of the project alongside Watsonville Road would be the new maintenance access road to be constructed from Watsonville Road to the golf course maintenance facility. There would be no structural entry features such as signage here since no public access to the golf course would be permitted from this direction.

In the interior area of the valley, the golf course, clubhouse and overnight units would not be visible from off-site vantage points~~, except for~~ even from the single dwelling that overlooks the valley from the adjacent ridge to the north. From the vantage point of this residence, the clubhouse/overnight complex would be completely blocked by the intervening low hills and ridges just north of the complex.

Mitigation 1. **The project would be designed and landscaped in a manner to help it blend in with the natural and rural surroundings, and to reduce its visibility from off-site locations.**

The site planning measures proposed as part of the project, including buffer zones from all adjacent roadways, as well as the proposed landscaping and berming, would minimize the potential visual effects of the project. The design of the residential areas reflects many of the guidelines of the San Martin Integrated Design Plan (see Section *II. Consistency with Plans, Policies and Regulations.)*

All structural elements such as signs, fences, lighting or other entry features would be subject to Architectural and Site Approval to ensure their compatibility with the surroundings. In addition, any structures proposed within 100 feet of adjacent scenic roads would be subject to the County's Design Guidelines.

L. NOISE

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Impacts and Mitigation

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Impact 3. **Noise generated by golf course mowers would have a potentially adverse effect on the nearest dwellings proposed on the project site. (Potential Significant Impact)**

The mowing machines used at the golf course would be the loudest noise sources. These pieces of equipment typically generate noise levels no higher than 70 dBA at a distance of 50 feet.

The closest existing residence to the proposed golf course would be the existing ranch house near the eastern limits of the project site, which would be 900 feet from the golf course at its nearest point. At this location, the highest noise levels from mowers would be approximately 45 dBA. The average noise levels would be less.

The second closest residence would be the home to the north of the central area of the site on the nearest off-site ridge, which would look down on the golf course, and which would be 1,600 feet from the golf course at its nearest point. For this home, the maximum noise levels generated by lawn mowers would be 41 dBA at the nearest point near the project boundary. This noise level would be barely audible with the windows open.

The closest new lots in the proposed cluster subdivision along the north side of the main access road would be ~~200~~ approximately 70 feet from the golf course at the nearest points, and the dwellings themselves would be ~~at least~~ ~~230~~ approximately 120 to 150 feet away (~~given the minimum required front setback distance of 30 feet~~ since these estate homes would be set back at 50 to 80 feet from the roadway). At the ~~nearest~~ front of the dwellings, the maximum noise from mowers would be approximately ~~58~~ 61 to 63 dBA (noise levels drop off by 6 dBA for each doubling of distance from the source). The maximum levels of mowing noise would exceed the County's 55 dBA threshold for the new proposed lots in the subdivision located north of Holes ~~8~~ 1 and ~~9~~ 2 at the eastern end of the golf course. According to the County's noise ordinance, however, ~~the maximum mowing~~ noise levels of ~~58~~ 60 to 65 dBA would not constitute a noise impact if the residences were subject to these noise levels for less than ~~15~~ 5 minutes in any hour, and noise levels of 55 to 60 dBA would not constitute a noise impact if the residences were subject to these noise levels for less than 15 minutes in any hour. Since maximum noise levels would drop off to 55 dBA at a distance of approximately ~~330~~ 350 feet from the source, ~~the noise threshold would be exceeded by the mowing of a band of turf 100 feet wide (or less, depending on the location of individual dwellings relative to the fairway)~~ turf mowing would be in compliance with the noise ordinance if it occurred for no more than 5 minutes in any hour along the northern-most 30 feet of fairway along the roadway, and for no more than 15 minutes in any hour with the band between 30 feet and 230 feet from the roadway. It is expected that the gang reel mowers would complete mowing of ~~that strip within 15 minutes~~ these areas within the alloted times with respect to any of the individual residences affected. It should be noted that the average noise level generated by mowers would be less than 5 dBA above the

background level in the area of the proposed residences. In addition, fairway mowing would typically occur in the afternoon.

Mitigation 3. **The hours of mowing within ~~330~~ 350 feet of any existing or proposed residences, would be restricted to weekdays between the hours of 8:00 a.m. and 5:00 p.m., with total noise generating activities in those areas restricted in accordance with the limits set forth in the County's Noise Ordinance.**

Beyond the requirements of the County's Noise Ordinance, the CC&Rs for the project should establish clear guidelines for operational golf course noise to minimize potential annoyance and inconvenience for all concerned.

Impact 4. **Activities at the clubhouse would increase noise levels in the interior of Hayes Valley. (Less-than-Significant Impact)**

Events at the clubhouse, such as weddings or banquets, would generate noise from music played at such events. There are two existing residences in the vicinity which would be within audible range of the clubhouse. One residence is located approximately ~~3,600~~ 3,000 feet from the clubhouse on the northern ridge overlooking the valley. An on-site ridge located mid-way between the clubhouse and this residence would break the line of sight between these two structures and would provide noise shielding under normal atmospheric conditions. The second potentially affected residence is the existing on-site ranch house located approximately ~~2,400~~ 3,000 feet east of the clubhouse, along West Branch Llagas Creek. The line of sight between the clubhouse and the ranch house would be unbroken by intervening terrain.

To evaluate potential noise impacts to these existing residences, worst-case meteorological conditions were assumed. The conditions of maximum sound propagation would be a temperature inversion with a light wind blowing toward the receiver. Under these conditions the sound levels would bend down from the atmosphere toward the receptor, thus negating shielding by intervening hills, buildings and other barriers. It was calculated by Illingworth & Rodkin that the sound level of a loud rock band inside the clubhouse with the windows open would be about 35 to 40 dBA outside the on-site ranch to the east, and about 35 dBA outside the ridgetop house to the north. Under the vast majority of meteorological conditions, sound levels would be 10 to 20 dBA lower, and essentially inaudible. Under conditions of good sound propagation, the sound of a very loud event at the clubhouse could be audible outdoors at these residences. However, it is also most likely that under these conditions the windows in the clubhouse would be closed because it would have to be quite cold to create the type of inversion needed to result in the highest sound levels. Therefore, it is expected that sound from the clubhouse would be audible at the nearest residences, but only under rare circumstances.

The nearest residences proposed within the project itself would be located ~~1,200~~ 1,500 feet to the east of the clubhouse. Under the worst-case meteorological conditions described above, the noise level at the nearest residence would be about 40 to 45 dBA, outside the residence. This noise level would still be well under the County's noise criteria of 55 dBA for residential land uses.

Mitigation 4. **No mitigation required.**

Impact 5. **Noise levels would be temporarily elevated during grading and construction. (Potential Significant Impact)**

Most of the existing noise receptors in the area are far from the main grading and construction area of the golf course. The major exception is the existing ranch house at the east end of the site. During construction, maximum noise levels generated by grading, paving, and other activities would be 5 to 10 decibels lower. If average levels do not exceed 55 dBA, there would be no interference with outdoor activity or indoor activity, although the construction may be occasionally audible. Noise levels at the existing ranch could reach as high as 80 dBA with average levels of up to 75 dBA. During most of construction, however, noise levels would be significantly below 55 dBA.

The existing residence on the ridge to the north of the project site would be approximately 1,200 feet from the nearest grading activity for the golf course. At this distance, the sound of equipment would be noticeable but would not exceed 55 dBA.

At the eastern end of the project site, existing dwellings in the vicinity would be subject to short-term grading and construction noise impacts from construction of the perimeter berms, the detention basin along Coolidge Avenue, the package wastewater treatment plant and lake/detention basin along Turlock Avenue, and to a lesser extent the proposed residential subdivisions which would be set back from the site boundary.

At the western end of the site, the construction of the maintenance access road to Watsonville Road would generate noise from grading and paving. The nearest existing dwelling would be 700 feet from this maintenance road at its nearest point, and would not be subject to construction noise impacts, although the noise would be audible.

Mitigation 5. **Short-term construction noise impacts would be reduced through compliance with the County's Noise Ordinance with respect to hours of operation and maximum noise levels at adjacent property lines. At the eastern edge of the project, the berms proposed along the project boundary would be constructed during the early phases of grading to provide a noise barrier for existing residences nearby.**

~~For example,~~ The Noise Ordinance stipulates that construction noise generated between 7 am and 7 pm on weekdays and Saturdays should reach noise levels no greater than 75 dBA at an adjoining property line of a single-family or two-family dwelling.

These hours would be enforced by the grading inspector, and also the County Department of Environmental Health in the event of a violation of the County Noise Ordinance.

To minimize noise generation, construction equipment should be maintained in good operating condition and properly muffled.

To further reduce construction noise impacts, the berms proposed for the eastern project boundaries would be constructed during the early phases of grading in order to provide shielding from construction and grading in the interior of the project. This would be

particularly effective in attenuating noise from grading and excavation for the detention basin along Coolidge Avenue, and the package wastewater treatment plant and lake/detention basin along Turlock Avenue.

Conclusion. **Implementation of the above mitigation measures would reduce noise impacts resulting from the project to less-than-significant levels.**

N. HAZARDOUS MATERIALS, PUBLIC HEALTH AND SAFETY

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Impacts and Mitigations

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Impact 4. **The ~~equestrian facility~~ horse stable could result in potential vector and odor impacts. (Potential Significant Impact)**

Vectors such as flies and rodents could become a problem if the stables ~~are~~ is not properly managed. Offensive odors could develop from a large accumulation of manure or other poor husbandry practices.

Mitigation 4. **The ~~equestrian facility~~ stable would employ vector control measures, and would be operated in accordance with a manure management plan in conformance with State law, which would also be reviewed and approved by the County Department of Environmental Health.**

A manure management plan would be required under Title 23, Chapter 15 of the California Code of Regulations. The stable would be operated as cleanly as possible to reduce vectors and the potential for odor. Specific vector controls would include baiting for flies, manure management and rodent trapping. Hay would be stored in a small barn and all feed grain would be stored in enclosed containers to reduce availability to rodents.

Manure management practices would consist of cleaning up manure daily and placing it in debris boxes which would be emptied ~~daily or every other day~~ on an as-needed basis and taken to a local landfill.

The ~~equestrian facility~~ stable would be subject to Article 47 of the County zoning ordinance which requires that stables not create a nuisance, and that they be set back from water courses and neighboring uses. The ordinance requires that erosion control plans be prepared for stables, and that they by subject to Architecture and Site Approval.

APPENDICES

APPENDIX C

Geologic and Geotechnical Site Review

Prepared by

Twining Laboratories

May 1998

GEOLOGIC AND GEOTECHNICAL SITE REVIEW
NEW CLUBHOUSE AND OVERNIGHT LODGES
CORDEVALLE GOLF CLUB AND HOTEL
SAN MARTIN, CALIFORNIA

Project Number: D34301.03

Prepared by The Twining Laboratories

for:

Lion's Gate Limited Partnership, LLC
395 Oyster Point Boulevard, Suite 309
South San Francisco, California 94080

May 29, 1998

D34301.03-02

May 29, 1998

Lion's Gate Limited Partnership, LLC
395 Oyster Point Boulevard, Suite 309
South San Francisco, California 94080

Attention: Mr. Sky Joyner

Subject: Geologic and Geotechnical Site Review:
New Clubhouse and Overnight Lodge Area
Cordevalle Golf Club and Hotel
San Martin, California

Dear Mr. Joyner:

The Twining Laboratories (Twining) is pleased to submit this report of Geologic and Geotechnical Site Review evaluating potential geologic and geotechnical hazards that could impact the new Clubhouse and Overnight Lodges site at the Cordevalle Golf Club and Hotel. The proposed site location is on a gently sloping hillside, north of the golf course. Geologic and geotechnical hazards were previously evaluated by Twining for a Clubhouse and Overnight Lodge facilities site about 1,000 feet south of the currently proposed site location. Twining has also performed several geologic and geotechnical investigations for other projects near the proposed Clubhouse and Overnight Lodge site (see section 2.0). In addition, Twining performed a geologic site reconnaissance for the subject site and is currently conducting a preliminary geotechnical investigation. Twining was requested and authorized to perform this site review by Mr. Ron Davis, with the Cordevalle Golf Club and Hotel, on May 20, 1998.

The potential hazards investigated included expansive soils, erosive soils, shallow groundwater, landslides and slope stability, seismic ground shaking, fault rupture, earthquake induced liquefaction and seismic settlement. Our assessment indicates that the proposed development is feasible with respect to the geologic and seismic hazards evaluated, provided the conclusions and proposed mitigative measures described in this report are implemented.

We appreciate the opportunity to be of service to Lion's Gate Limited Partnership, LLC. If you have any questions regarding this report, or if we can be of further assistance, please contact us at your convenience.

Sincerely,
THE TWINING LABORATORIES, INC.

Kenneth J. Clark, CEG
Engineering Geologist
Geotechnical Engineering Division

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

TABLE

DRAWINGS AND FIGURES

GEOLOGIC AND GEOTECHNICAL SITE REVIEW
PROPOSED CLUBHOUSE AND OVERNIGHT LODGES
CORDEVALLE GOLF CLUB AND HOTEL
SAN MARTIN, CALIFORNIA

1.0 INTRODUCTION

This investigation evaluates potential geologic and geotechnical hazards that could impact the new Clubhouse and Overnight Lodges site located at the Cordevalle Golf Club and Hotel.

The Geotechnical Engineering Division of Twining, headquartered in Fresno, California, performed the investigation. This report is provided specifically for the new Clubhouse and Overnight Lodges site located at the Cordevalle Golf Club and Hotel, referenced in the "Background Information" section of this report.

2.0 PURPOSE AND SCOPE OF INVESTIGATION

The purpose of the investigation was to evaluate geologic hazards and general geotechnical conditions relevant to the proposed development of the subject property in support of an environmental impact report for the project.

This investigation did not include a design level geotechnical engineering investigation, pavement design, floodplain investigation, compaction tests for construction, environmental investigation, or environmental audit.

The actions undertaken during the investigation are summarized as follows.

I. The following documents prepared by others were reviewed:

- Prepurchase Site Assessment of Geologic Hazards, Ground Water Supply and Environmental/Toxic Contamination, Hayes Valley Property, Santa Clara, California, Project 4297, prepared for LAND USE, by TERRATECH, INC., January 20 1988.

- Supplemental Geological Reconnaissance Investigation for Proposed Hayes Valley Dams, Santa Clara County, California, prepared by Kaldveer Associates Geoscience Consultants, August 4, 1989.

- Geologic Input to Draft Environmental Impacted Report, Lions Gate Development, project HRC-101B, prepared by Wahler Associates for HR Development Partners, April 17, 1990.

- Geologic Input to EIR, prepared by ENGEO Incorporated, April 13, 1993.

- Geologic Feasibility Investigation, Golf Course Maintenance Building, The Lion's Gate Reserve, San Martin , California, Project 1385/6G, prepared for Hayes Valley Development Partners, by Pacific Geotechnical Engineering, December 1995.

- Preliminary Geologic Feasibility Evaluation, Homesites on Parcels #24, #25, and #26, The Lion's Gate Reserve, San Martin, California, Project 1385/7G, prepared for Hayes Valley Development Partners, by Pacific Geotechnical Engineering, December 1995.

- Geologic Feasibility Investigation, Clubhouse and Overnight Lodges, The Lion's Gate Reserve, San Martin, California, Project 1385/5G, prepared for Hayes Valley Development Partners, by Pacific Geotechnical Engineering, December 1995.

- Administrative Draft Environmental Impact Report, Volume IIa Technical Appendices, Lion's Gate Reserve, December 1995.

- Draft Environmental Impact Report, Volume II Technical Appendices B through E, Lion's Gate Reserve, March 1996.

II. The following geologic and geotechnical reports prepared by The Twining Laboratories were reviewed:

- Report entitled Preliminary Geotechnical Engineering Investigation, Golf Coarse, dated March 18, 1997, and Addendums No. 1 and No. 2.

- Letter report entitled "Review of Site Geologic Conditions and Grading Plans, Golf Course Phase", dated May 6, 1997.

- Report entitled "Preliminary Geotechnical Engineering Investigation, Clubhouse and Overnight Lodges" (former proposed site), dated October 30, 1997.

- Letter report entitled "Preliminary Evaluation of Geotechnical and Geological feasibility, Clubhouse and Overnight Lodge Area" (proposed new site), dated April 16, 1998.

III. Reviewed pertinent published geologic literature and maps for the project site area.

IV. A site reconnaissance and subsurface exploration were conducted on May 5 and 20, 1998.

V. Mr. Ron Davis and Mr. Sky Joyner with Cordevalle Golf Club and Hotel, and Mr. Bert Verrips with Nolte Engineering, and Mr. Loren Kroeger with Backen & Gillam Architects, were consulted during the investigation.

VI. The data obtained from the investigation were evaluated and this report was prepared to present our findings and recommendations.

3.0 BACKGROUND INFORMATION

The following background information is based on our review of the documents listed in section 2.0, consultation with the project planners, and geologic reconnaissance, and our preliminary geotechnical investigation of the site. The site description, anticipated construction, previous studies, and regional geologic conditions are summarized in the following subsections.

3.1 Site Description: The proposed Clubhouse and Overnight Lodges site occupies a portion of the 1,676 acre Cordevalle Golf Club and Hotel. The Cordevalle Golf Club and Hotel is located west of the intersection of Highland and Turlock Avenues, about two miles southwest of the City of San Martin in Santa Clara County, California. A site location map is provided as Drawing No. 1. The proposed Clubhouse and Overnight Lodges are to be located on a gently sloping colluvial swale and a sloping hillside, north of the proposed golf course. A Pro Shop is proposed east of the Clubhouse, and a Range House is proposed north of the Clubhouse. An ephemeral creek is located between the Clubhouse and the Pro Shop. Llagas Creek is located about 75 to 100 feet south of the proposed facilities. Native slope gradients range from about 2.5 horizontal (H) to 1 vertical (V) on the hillside, to nearly flat near the ephemeral creek. Drawing No. 2 provides a conceptual plan of the facilities.

3.2 Anticipated Construction: We understand that design of the proposed Clubhouse and Overnight Lodges is currently underway, and final details have not been finalized. Anticipated construction includes the construction of the Clubhouse, Overnight Lodges, and associated asphaltic paved roads, parking lots, driveways, and cart paths. The proposed construction will include a Clubhouse building which is largely one-story and 34,000 square feet in plan dimension. The Clubhouse will include an approximate 7,000 square foot second-story, and a 9,000 square foot partial basement for a wine cellar and cart storage. We anticipate the Clubhouse will have a slab-on-grade floor at the basement level, and concrete floor slabs on a steel framed metal pan deck for the ground floor level.

Forty-five Overnight Lodges are planned for the south facing hillside slope, west of the proposed Clubhouse. The Overnight Lodge units will be 550 to 600 square feet in plan dimension. Five meeting rooms with plan dimensions of about 500 square feet will be connected to individual Overnight Lodge units. The lodges and meeting rooms will be slab-on-grade, wood-frame structures.

Grading plans were not available at the time this report was prepared; however, earthwork cuts on the order of 10 feet or less and fills of 10 to 20 feet are anticipated for the Clubhouse and Overnight Lodges.

3.3 Previous Studies: We have reviewed the geologic reports listed under "Purpose and Scope". Most of the cited reports present descriptions of regional geologic and tectonic conditions, and general site geologic conditions. Our summary of these regional conditions are presented below. Geologic conditions applicable to the subject site, which are described in these reports, and conditions noted during our field reconnaissance and geotechnical investigation of the site, are summarized in the "Evaluation" section of this report.

3.4 Regional Geologic Conditions: The earth materials underlying the project site region are composed of rocks belonging to the Franciscan Complex of Jurassic to Cretaceous age. Bedrock types found within the Hayes Valley area include sandstone, shale, chert, limestone, greenstone, and low grade metamorphic rocks. Many areas of bedrock terrane include a mixture of different rock types in a sheared matrix. This formational mixture is termed a melange, and was formed as a result of intense shearing and faulting. Serpentine type rock is also found within this assemblage of rocks.

The regional trend of geologic structures in the Hayes Valley area is roughly east-west, acute to the overall geologic structure of north 40 degrees east for the Santa Cruz Mountains as a whole. Physiographic features, bedrock contacts, and faults are generally parallel to this structural trend.

The distribution of geologic units and structures (including faults) depicted on the ENGEO map is generally suitable for planning purposes for the proposed project. This map is included as Figure No. 2 of the report entitled "Geologic Input for EIR For Lion's Gate Property", dated April 13, 1993 (contained in the Draft Environmental Report [DEIR]).

The Sargent-Berrocal faults are located approximately 2.5 miles southwest of the site and the active San Andreas Fault is located approximately 5 miles southwest of the site. The active Calaveras and Hayward faults are both located approximately 8 miles northeast of the site. Regional geologic maps prepared by U.S. Geological Survey and the California Division of Mines and Geology show a bedrock fault and bedrock contacts within the melange terrane on the north side of Hayes Valley. The fault and contacts are shown on the Geologic Index Map (Figure 1) of the Geologic Feasibility Investigation for the Clubhouse and Overnight Lodges, prepared by Pacific Geotechnical Engineering, dated December 1995.

4.0 FIELD INVESTIGATION

4.1 Geologic Field Reconnaissance: A geologic field reconnaissance of the proposed Clubhouse and Overnight Lodges area was conducted in conjunction with our geotechnical investigation of the golf course and surrounding areas, performed on April 28, 1997. The reconnaissance, which included confirming previously mapped geologic features and noting potential geologic hazards, was performed by Mr. Kenneth J. Clark, a Twining Certified Engineering Geologist. Field reconnaissance of the subject site was also performed by Mr. Clark on May 5, 1998. The results of the reconnaissance are provided in the Section 6.0 "Evaluation".

4.2 Geotechnical Investigation Test Borings: On May 5, 1998, five test borings were drilled by Twining within the proposed Clubhouse and Overnight Lodges area to investigate soil, rock, and groundwater conditions. The borings were advanced to a depth of 20 feet below site grade, or until refusal was encountered on hard bedrock materials. Disturbed and undisturbed soil samples were collected for geotechnical laboratory analyses in conjunction with the geotechnical engineering investigation. In addition, two bulk samples were collected for R-value testing (for pavement design). The test borings were drilled, and R-value samples were collected at the locations shown in Drawing No. 2.

4.3 Exploratory Trenching: On May 7, 1998, two exploratory trenches (Trenches A and B) were excavated across the proposed Clubhouse and Overnight Lodges sites to assess potential faults and general subsurface soil and rock conditions. Three additional exploratory trenches (Trenches C, D, and E) were excavated on May 20, 1998 in the area of the Overnight Lodges. Soil and rock exposed in the trench walls were observed by Twining's engineering geologist on May 20, 1998. The locations of the trenches are shown on Drawing No. 2.

5.0 FINDINGS

5.1 Site Soil and Rock Conditions: The project site spans two general geologic units. The proposed locations of the eastern half of the Clubhouse, Range Building, and the entire Pro Shop are located predominantly on Quaternary alluvial soils located in the lower drainage areas. Soils below the proposed Clubhouse and Pro Shop locations comprised gravelly and sandy lean clays. The clays were generally soft to medium stiff from the ground surface to a depth of about 3 feet BSG. The underlying clays were stiff to very stiff as indicated by Standard Penetration Resistance blow counts documented during collection of soil samples. Weathered greenstone was encountered between depths of 7 to 19 feet below site grade (BSG) in the borings drilled at the proposed clubhouse and Pro Shop sites. If treated as a soil, the weathered greenstone was dense to very dense as indicated by blow counts.

The Overnight Lodges are to be located on the hillside portions of the site. The hillside areas are comprised primarily of relatively shallow soils overlying greenstone rocks of the Franciscan Complex. Exploratory trenches revealed bedrock at a depth of about 2 to 4 feet BSG on the hillside areas investigated.

5.2 **Groundwater Conditions:** Groundwater occurs in the alluvial soils on the eastern portion of the site, in the area of the proposed Clubhouse, Range House, and Pro Shop. Groundwater was encountered at depths of 5.5 and 16 feet BSG in two borings drilled in the eastern portion of the Clubhouse area. One test boring drilled in the western portion of the Clubhouse did not encounter groundwater above the depth of refusal on bedrock at 7 feet BSG.

Groundwater was not encountered in exploratory trenches excavated on the hillside locations of the Overnight Lodges. However, the presence of near surface (standing) water and phreatophyte vegetation suggest that groundwater seepage may occur from native slopes in the project area. In addition, springs were reported (ENGEO, Incorporated, 1993) occurring along a fault lineation within the proposed site area. Seepage would likely be exacerbated on cut slopes constructed for the project.

Erosion may be accelerated and slope stability compromised where groundwater daylights (seeps) onto slopes. Conditions in the site area favoring seeps include relatively shallow bedrock (or other impermeable layer) with an overlying permeable soil, and inactive fault zones which can act to concentrate subsurface water.

5.3 **Faults:** Two subparallel fault traces have been mapped in the immediate site area (Wahler Associates, 1990, and Kaldveer Associates, 1989). The locations of these mapped faults are shown on Drawing No. 2 with respect to the proposed facilities. The northern trace is located near the axis of the ravine, north of the clubhouse. The southern fault is located through the area of the Overnight Lodges.

Two brecciated zones indicative of faulting were noted in Exploratory Trench A. Rocks in the brecciated zone were a light grey color and appeared to be sheared and chemically altered greenstone. The location of the brecciated zone is approximately coincident with the south fault trace, the springs noted by Wahler (1990), and our field reconnaissance. A dark brown lean clay soil horizon was developed on both the weathered greenstone, as well as rocks in the brecciated zone. The lean clay soil did not appear to be offset or disrupted above the brecciated zone which would suggest recent movement.

6.0 EVALUATION

This section presents information regarding potential geologic, geotechnical, and seismic hazards at the Clubhouse and Overnight Lodges area.

6.1 Geologic Hazards: Geologic and geotechnical hazards including expansive soils, erosion, landslides, seiches, tsunamis, and volcanic activity are evaluated in the following subsections.

6.1.1 Expansive Soils: The predominant soil type anticipated at the site area is lean clay. In general, the clayey soils (revealed during previous investigations near the site area) exhibited, moderate compressibility, and the potential for low to moderate swell. The primary geotechnical concerns at the site are the medium expansion potential of the lean clays. Over time the near surface clays will experience cyclic drying and wetting as the dry and wet seasons pass. The clay soils encountered at the site are anticipated to experience volumetric changes (shrink/swell) as the moisture content of the clay soils fluctuate. These shrink/swell cycles can impact foundations and lightly loaded slabs-on-grade even though the expansion potential is classified as medium. Expansive soils cause more damage to structures, particularly light buildings and pavements, than any other natural hazard, including earthquakes and floods (Jones and Holtz, 1973). Expansion potential may not manifest itself until months or years after construction. At most sites there exists a depth to which the moisture content of the subgrade remains essentially constant throughout the year; thus, the clays would not undergo a significant volume change below this depth. Therefore, the depth, referred to as the "critical depth", to which significant moisture fluctuation occurs influences the selection of suitable foundation and floor slab alternatives for this site. Climatic conditions, groundwater conditions, landscape irrigation, and the soil conditions effect the critical depth. Our review of moisture data and observations of near surface clay soils did not clearly demonstrate a critical zone depth. Based on experience, it is expected that the critical zone would be approximately 36 inches BSG in the site region, and that seasonal moisture fluctuation would effect soils to a depth of 3 feet BSG. The above estimate of the critical depth should be reevaluated based on soil sample test data to be generated for the proposed geotechnical and geological investigation.

6.1.2 Erosion Hazard: Erosional features indicative of the unusually rapid erosion of the earth materials at the site were not noted during our field reconnaissance. Based on our geologic and geotechnical investigation of the site, the soil and rock conditions are not prone to excessive erosion. Accordingly, the potential erosion hazard at the site is low.

6.1.3 Landslides and Slope Stability: Landslides on the proposed development site were mapped by others (Kaldveer Associates, 1989, and Wahler Associates, 1990). The locations of these landslides are shown on Figure No. 2 of the report entitled "Geologic Input for the Lion's Gate Property" (DEIR Volume II) which is a compilation of site data generated prior to April 1993. Two previously mapped landslide features near the site were observed

during our geologic field reconnaissance and appeared to comprise relatively shallow rotational block slides and slumps. The two mapped landslide masses are located north of the proposed Clubhouse and Overnight Lodges site. These slides are separated from the subject site by a ravine which would preclude impact to the site if the masses were remobilized. Accordingly, the documented slide masses do not present a hazard to the project site.

Other existing slide features, which could potentially affect the proposed project, were not noted during our geologic field reconnaissance. Based on our field observations native slopes in the vicinity of the project site appear to be relatively stable.

6.1.4 Inactive Faults as Foundation Discontinuities: Subsection 6.2.2 indicates that faults noted in the subject area are inactive and the potential is low for ground rupture due to earthquake faulting, or rupture due to seismic ground motion induced movement across an inactive fault. However, structures built across faults may be supported on soil or rock materials with highly variable foundation properties and excessive differential settlement can result. Variable foundation properties may result from dissimilar earth materials juxtaposed across the fault, or by structurally weak zones of sheared rock coincident with the faults. Potential differential settlement due to weak shear zones may be mitigated by soil foundation modification, using deep foundations, or modifying the location of a structure away from the shear zone. Mitigation measures are described in subsection 7.7.

6.1.5 Serpentinite: Twining's field investigation did not encounter serpentinite type rock materials in the project area. In addition, the "Aerial Geologic Map" prepared by Kaldveer Associates (1990) does not indicate serpentinite in the area of the proposed Clubhouse and Overnight Lodges. Accordingly, the potential for encountering naturally occurring asbestos materials during grading for the project is low.

6.1.6 Seiches and Tsunamis: A seiche is a wave generated by the periodic oscillation of a body of water whose period is a function of the resonant characteristics of the containing basin as controlled by its physical dimensions. These periods generally range from a few minutes to an hour or more. The site is not near any large bodies of water, so seiches are not considered a significant hazard at the site.

Tsunamis are waves generated in oceans from seismic activity. Due to the inland location of the site, there is no potential hazard from tsunamis.

6.1.7 Volcanic Activity: The closest known post Quaternary volcanic areas are near the Mammoth Mountain area in the Sierra Nevada Mountains, approximately 130 miles east of the site. Based on the distance of potential volcanic sources from the site, the prospects for lava flows or significant ash falls are low.

6.2 Seismic Hazards: The potential seismic hazards of ground shaking, ground rupture, liquefaction, and seismic settlement are evaluated in the following subsections.

6.2.1 Ground Shaking: For any given earthquake, the rock in the immediate vicinity will respond with a certain maximum acceleration and with a predominant period that depends on the nature of the rock and on the source mechanism. Away from the focus of the earthquake, the shock waves begin to attenuate. The way in which the earthquake wave is altered depends to a great degree on source characteristics and to a lesser degree on the travel path.

A detailed seismic analysis was conducted using two different methods, historic and probabilistic. Discussion of the analyses and the results are presented in the following subsections.

6.2.1.1 Historic Seismic Activity: The general area of the site has experienced recurring seismic activity. Based on historical earthquake catalogs published by the California Division of Mines and Geology, and supplemental data from Townley and Allen (1939) and the U.S. Geological Survey's earthquake database system, approximately 684 historical earthquakes with magnitude 4.0 or greater were recorded from 1800 through 1996 within a 100 mile radius of the site. A map showing the location of the project site with relation to the approximate historical earthquake epicenter locations is presented on Drawing No. 3. The source data presented include: latitude, longitude, date, time, depth, Magnitude, computed site acceleration, computed site Modified Mercalli intensity, and the approximate earthquake-to-site distance in miles and kilometers. This analysis was performed by a computer program titled EQSEARCH (1989).

An attenuation relationship, developed by Boore et al. (1993), was used to estimate the peak horizontal ground acceleration that may have occurred at the site from each of the historical earthquakes within the 100 mile search radius.

The nearest event (Mag.= 5.0, Acc.= 0.234g) found during the search occurred in 1938 approximately 1 mile southeast of the site. The largest magnitude earthquake identified in the search was the magnitude 8.25, 1906 San Francisco earthquake event occurring approximately 62 miles northwest of the site.

6.2.1.2 Probabilistic Seismic Hazards Analysis: The level of ground motion typically used for design of non-essential commercial developments is the ground motion with a 10% probability of being exceeded in 50 years, which is termed the "maximum probable earthquake". Determination of the Maximum Probable Earthquake requires probabilistic methods.

The computation of attenuated ground motion is based on the closest distance between the site and various measures of potential fault-plane ruptures along selected faults. The twenty (20) faults selected for this analysis are listed on Table No. 1. These selected faults comprise the local potentially active faults and regional faults with higher activity and magnitudes. The computations were conducted using FRISK (McGuire, 1978). FRISKSP version 3.00 programs (Blake, 1995) was used to set up the input data files and generate the output.

TABLE NO. 1
Summary of Fault Source-Model Parameters

FAULT NAME	Site to Fault Distance, Miles	SLIP RATE (millimeters per year)	Upper Bounds Magnitude
Sargent-Berrocal	3	1.0	7.0
San Andreas (Northern)	5	19	8.0
Hayward	8	9	7.0
Calaveras	8.5	7	7.5
San Andreas (Creeping)	10	34	7.0
Greenville	20	0.5	7.3
Monterey Bay Zone	24.5	2	6.0
Ord Terrace	26	0.16	5.5
Rinconada	27	1	7.0
Palo Colorado-San Gregorio	30	10	7.7
Chupines	31	2	6.0
Seaside	31	0.01	5.5
Navy-Turlarcitos	31	0.13	5.5
Ortigalita	31	0.04	7.0
Cypress Point	35	0.01	5.0
Coast Range-Sierran Block	38	3.0	7.0
Las Positas	38	0.2	6.3
Miller Creek-Palomares	41	1.2	6.3
Vernalis	45	0.4	6.5
Concord	59	4	6.7
Antioch	59	1	6.7
Green Valley	73	4	7.0

Fault parameters (such as fault length, magnitude, and rupture area) of faults capable of impacting the site were determined from published geologic papers (see bibliography), and the maximum magnitudes (100 year) were estimated using a characteristic fault model relationship (Youngs and Coppersmith, 1985). Due to the relative age of the faults and the absence of historic event data, subjective probabilities reflecting the relative slip rates reported were applied to account for the questionable activity of potentially active faults. The primary parameters used in the analysis are included in Table No. 1. The location of faults used in this analysis are provided on Drawing No. 4.

The ground motion attenuation relationship used in the analysis to estimate site response values was developed by Boore et al. (1993) for a Class A site (soil). The relationship for the larger component plus one standard deviation (as opposed to mean) was used. Boore et al. (1993) defines a class for each site based on the shear wave velocities of the upper 30 meters of material (about 200 feet). A Class A site has a shear wave velocity of 750 meters per second (m/s) or greater; a Class B site has a shear wave velocity of between 360 m/s and 750 m/s; a Class C site has a shear wave velocity of between 180 m/s and 360 m/s; and a Class D site has a shear wave velocity of less than 180 m/s. Our understanding of the shallow bedrock conditions in the site area suggest the subject site should be classified as a Class A site.

The horizontal site acceleration that has a 10 percent probability of being exceeded in 50 years (maximum credible event) was determined to be about 0.38g. The Probability of Exceedance vs. Acceleration for exposure periods of 25, 50, 75, and 100 years for the site are shown on Drawing No. 5. In addition, the Average Return Period versus Ground Acceleration is shown on Drawing No. 6.

6.2.2 Ground Rupture: Earthquakes are caused by the sudden displacement of earth along faults with a consequent release of stored strain energy. The fault slippage can often extend to the ground surface where it is manifested by sudden and abrupt relative ground displacement. Damage resulting from fault rupture occurs only where structures are located astride the fault traces that move.

The project site is located in a seismically active region with numerous active and potentially active faults. Two subparallel bedrock faults associated with melange terrane have been mapped near the proposed Clubhouse and Overnight Lodges (Wahler Associates, 1990, and Kaldveer Associates, 1989). The locations of these mapped faults are shown on Drawing No. 2 with respect to the proposed facilities. The northern trace is located near the axis of the ravine, north of the clubhouse. The southern fault is located through the area of the Overnight Lodges. According to Wahler (1990) the bedrock faults and sheared zones are apparently an extension of the Ben Trovato fault zone mapped northwest of the site. The Ben Travato Fault is designated as preQuaternary (Jennings, 1994), and is therefore considered inactive. During our geologic field investigation we noted evidence of several northwest-southeast trending faults

and/or shear zones delineated based on linear distribution of springs, linear zones of contrasting vegetation, and topographic expressions. Terratech (1988) reported photolineaments in alluvium along inferred fault traces. However, trenching by Wahler (1973) across projections of the lineaments in bedrock areas did not identify evidence of geologically recent fault activity. Wahler (1973) judged both the Hayes Valley Fault and the fault on the north side of the valley (near the subject site) to be inactive.

Data presented in the cited reports of previous investigations do not indicate that the bedrock faults in the site area are active. The nearest mapped active or potentially active fault is the Sargent, located about 3 miles east of the site. The project site is not located in a Fault-Rupture Hazard Zone or former Alquist-Priolo Special Studies Zones. Accordingly, the potential for surface fault rupture at the site is low.

6.2.3 Liquefaction: Liquefaction in this instance describes a phenomenon in which a saturated, cohesionless soil loses strength during an earthquake as a result of induced shearing strains. Lateral and vertical movement of the soil mass, combined with loss of bearing usually results. Research has shown that liquefaction potential of soil deposits induced by earthquake activity depends on soil types, void ratio, groundwater conditions, duration of shaking, and confining pressure over the potentially liquefiable soil mass. Fine, well sorted, loose sand, shallow groundwater conditions, higher intensity earthquakes, and particularly long duration of ground shaking are the requisite conditions for liquefaction.

Studies of liquefaction potential during earthquakes address the liquefaction "susceptibility" and "opportunity" of a given site. Liquefaction susceptibility is a function of the mechanical properties of the underlying soils, particularly grain size distribution and relative density determined from standard penetration blow counts. Liquefaction opportunity expresses the probability of exceeding a critical level of shaking and is described in terms of a function which accounts for peak ground acceleration, or acceleration and duration. Accelerations of at least 0.10g and ground shaking durations of at least 30 seconds are generally required to initiate liquefaction.

The potential for the occurrence of an earthquake with the intensity and duration characteristics capable of promoting liquefaction "opportunity" is considered likely for the project life of the proposed Clubhouse and Overnight Lodges. Considering that granular soils were not identified, and that liquefaction will not occur in areas of very shallow bedrock, the "susceptibility" for liquefaction is considered very low.

6.2.4 Seismic Settlement: Seismic shaking may induce settlement of loose, unconsolidated sediments. This can occur in unsaturated and saturated granular soils. Considering that loose or granular soils were not identified at the site during or field exploration, in conjunction with the shallow depth to bedrock, the potential for seismic induced settlement is considered very low.

7.0 CONCLUSIONS

Based on the data collected during our investigation and our understanding of the anticipated construction, we present the following general conclusions and mitigation measures. Considering the conclusions and mitigation measures, the proposed project is feasible with respect to geotechnical, geologic, and seismic hazards.

7.1 The site appears geologically and geotechnically suitable for the proposed Clubhouse and Overnight Lodges facility considering the conclusions and mitigation measures presented in this report. The geotechnical and geologic issues requiring mitigation are discussed below.

7.2 Soil and rock conditions at the site vary from alluvial soils on the eastern portion of the site to soils developed on colluvium, and residual soils (lean clays) developed on the shallow bedrock on the western (hillside) portions of the site. Soils below the Clubhouse and Pro Shop comprised gravelly and sandy lean clays. Weathered greenstone bedrock was encountered between depths of 7 to 19 feet BSG at the proposed Clubhouse and pro shop sites. Rock was encountered at depths of 2 to 4 feet BSG on the hillside portion of the site.

7.3 Testing of lean clay soils collected from sites near the proposed Clubhouse and Overnight Lodges have been reported to have a low to moderate shrink-swell potential. Lean clay soils at the site may exhibit low to moderate expansion characteristics. To mitigate the potential for structural damage resulting from expansive soils, non-expansive materials can be placed below slabs, and foundations can be extended below the depth where moisture changes in soil cause volumetric changes. This depth is preliminarily estimated to be approximately 36 inches below site grade. To minimize the potential for fluctuations in soil moisture near buildings, grading should be conducted to direct drainage away from the buildings and prevent ponding near the building. Landscaping setbacks can also be instituted to minimize the potential for ponding of water near the foundation.

7.4 As evidenced by springs and seeps, shallow groundwater may be encountered during grading of the hillside slopes.

7.5 Potential erosion and slope stability hazards which may be caused by shallow groundwater at the site can be mitigated by the following methods:

- Road subgrades: Trenched cut-off walls and subdrains
- Native slopes: Upslope trench cut-off wall or horizontal wick drains
- Cut slopes: Retaining wall with filter drain and weep holes
- Fill slopes: Cut-off drains placed in keyways and other locations where subflow impinges on fill slopes.

Subsequent to rough grading, areas with evidence for subsurface groundwater flow should be identified by Twining's civil engineer or engineering geologist. Soil textures exhibiting a selective removal of fine particles from currently dry soils may indicate subsurface groundwater flow during wetter periods. Mitigative measures can be selected by Twining's civil engineer or engineering geologist for specific areas, when adverse shallow groundwater conditions are identified.

7.6 The soils are estimated to have a low erosion hazard. Based on our understanding of the anticipated construction, soil erosion is not expected to significantly affect the project.

7.7 Trenching exploration of the subject site did not reveal evidence of active faults (see section 6.2.2), however, brecciated and sheared zones were noted indicating older (inactive) faults within the greenstone bedrock. These shear zones are typical for Franciscan Complex (melange terrane) materials. Differential settlement across and within an inactive fault zone may occur, and damage may occur to buildings constructed across those zones. Potential differential settlement due to weak shear zones may be mitigated by overexcavation and recompaction of foundation soils over the fault discontinuity, or deep foundations such as drilled shafts or driven piles. In addition, mitigation may include modifying the location of a structure away from the shear zone. Specific foundation recommendations can be provided in the design level geotechnical engineering report.

7.8 Native slopes in the vicinity of the project site appear to be relatively stable and suitable for the proposed construction based on maximum cut and fill slopes of 2 horizontal (H) to 1 vertical (V). Existing landslide features were not noted which could affect the project. Further evaluation of slope stability should incorporate the proposed site grading plan. In addition, Twining's engineering

geologist should be contacted to observe soil, rock and associated groundwater conditions revealed after mass grading. If unstable native slopes are encountered, they can be mitigated by removal of the unstable material, buttressing the material, or providing subflow cut-off drains and limiting infiltration of surface water. Cut and fill slopes of not greater than 2 horizontal (H) to 1 vertical (V) can be constructed in accordance with the Uniform Building Code to provide stable foundations for construction. Steeper cut or fill slopes, if required, may be feasible contingent on evaluation on a case-by-case basis.

7.9 The potential to encounter serpentine and asbestos at the project site is low. However, if asbestos containing materials are encountered during grading, the locations should be documented and the asbestos content in the serpentine should be assessed by Twining's engineering geologist. Serpentine rock is typically a green or yellow, highly sheared and altered rock, with a fibrous appearance. Where final graded areas expose asbestos-containing serpentine, or where asbestos-containing fill material is used, the potential for human exposure to asbestos can be mitigated by placing a layer of non-asbestos containing material over the asbestos containing material.

7.10 There is little or no potential for hazards due to volcanic activity, seiches, and tsunamis at the site.

7.11 A maximum probable peak horizontal ground acceleration of 0.38g is estimated for the proposed development site. Building design and construction in accordance with the Uniform Building Code can mitigate the potential effects of the maximum probable peak horizontal ground acceleration estimated for the site.

7.12 Mitigation for potential surface rupture of an active fault typically requires establishing building setbacks. However, trenching exploration of the subject site did not reveal evidence of active faults. The site is not located in a Proposed Seismic Hazard Zone or an Alquist-Priolo Special Studies Zone. Therefore, the potential for ground rupture associated with a known active fault is very low, and building setbacks would not be warranted.

7.11 Based on the soil and rock conditions at the site, the potential for liquefaction and seismic settlement are considered low. Accordingly, it is not anticipated that mitigation of potential liquefaction and seismic settlement would be required. In the event soil conditions susceptible to liquefaction or seismic settlement are revealed during design level geotechnical studies, the potential for liquefaction and seismically induced settlement can be mitigated. Mitigation can be achieved through site preparation, including densifying site soils by either overexcavation and compaction, ground modification techniques, using deep foundation (piles)

founded below liquefiable zones, or using reinforced structures.

8.0 NOTIFICATION AND LIMITATIONS

The conclusions presented in this report are based on the information provided regarding the proposed construction, the results of the research of background information, and our evaluation of site conditions revealed during our reconnaissance and subsurface geotechnical engineering investigation. This report does not present design level geologic or geotechnical data.

The focus of our investigation was the proposed Clubhouse and Overnight Lodges area and pertains only to geologic and geotechnical concerns of this site. Potential geotechnical and geologic hazards to structures on or outside of the subject site were not evaluated in this report.

If variations or undesirable conditions are encountered during construction, Twining should be notified promptly so that these conditions can be reviewed and our recommendations reconsidered where necessary. It should be noted that unexpected conditions frequently require additional expenditures for proper construction of the project.

If the proposed construction is relocated or redesigned, or if there is a substantial lapse of time between the submission of our report and the start of work (over 12 months) at the site, or if conditions have changed due to natural cause or construction operations at or adjacent to the site, the conclusions and preliminary recommendations contained in this report should be considered invalid unless the changes are reviewed and our conclusions and recommendations modified or approved in writing.

Changed site conditions, or relocation of proposed structures, may require additional investigations to determine if our conclusions are applicable considering the changed conditions or time lapse.

The conclusions contained in this report are valid only for the project discussed in the "Anticipated Construction" section of this report. The entity or entities that use or cause to use this report or any portion thereof for a structure or site other than those indicated in the "Background" section of this report shall hold Twining, its officers and employees harmless from any and all claims and provide Twining's defense in the event of a claim.

This report is issued with the understanding that it is the responsibility of the client to transmit the information and preliminary recommendations of this report to developers, owners, buyers, architects, engineers, designers, contractors, subcontractors, and other

parties having interest in the project so that the steps necessary to carry out these preliminary recommendations in the design, construction and maintenance of the project are taken by the appropriate party.

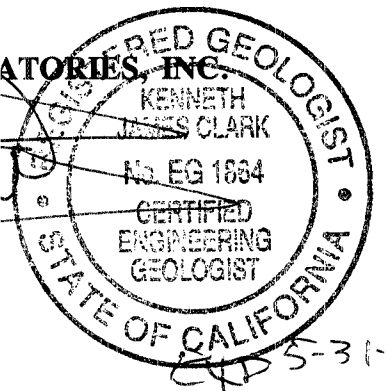
Reliance on this report by a third party (i.e., that is not a party to our written agreement) is at the party's sole risk. If the project and/or site is purchased by another party, the purchaser must obtain written authorization and sign an agreement with Twining in order to rely upon the information provided in this report for design or construction of the project.

Our professional services were performed, our findings obtained, and our recommendations prepared in accordance with generally-accepted engineering principles and practices in Santa Clara County, California at the time of the investigation. This warranty is in lieu of all other warranties either expressed or implied.

9.0 CLOSING

We appreciate the opportunity to be of service to Lion's Gate Limited Partnership, LLC. If you have any questions regarding this report, or if we can be of further assistance, please contact us at your convenience.

Sincerely,
THE TWINING LABORATORIES, INC.



Kenneth J. Clark, CEG
Project Geologist

5-31-99

cc: Mr. Ron Davis, Lion's Gate Limited Partnership, LLC
cc: Mr. Bert Verrips with Nolte Engineering

10.0 REFERENCES

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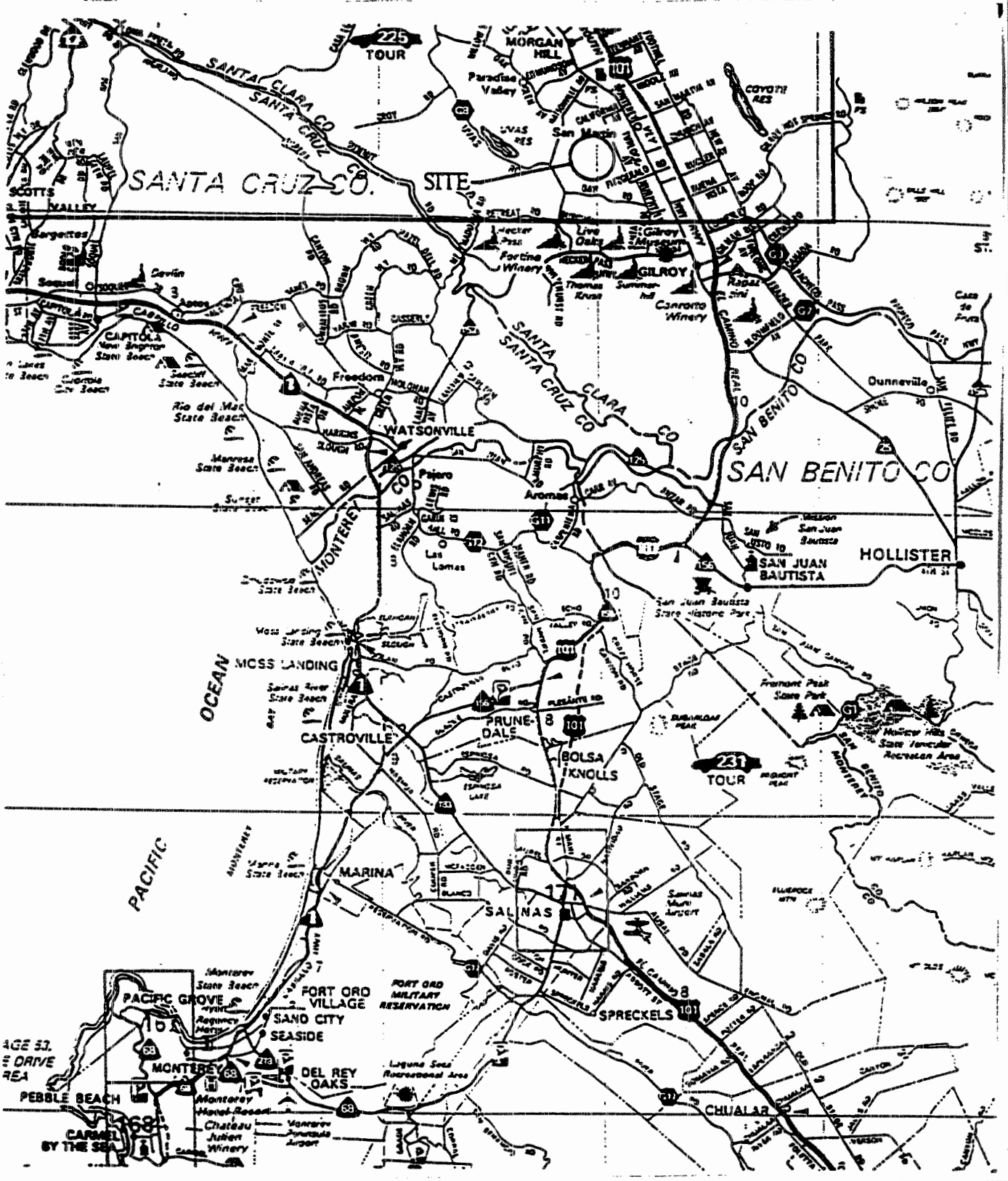

SITE LOCATION MAP NEW CLUBHOUSE AND OVERNIGHT LODGES CORDEVALLE GOLF CLUB AND HOTEL SAN MARTIN, CALIFORNIA	FILE NO.: N/A	DATE: 5-29-98	THE TWINING LABORATORIES, INC. EST. 1898 FRESNO/MODESTO/VISALIA/BAKERSFIELD/SALINAS
	DRAWN BY: PNG	APPROVED BY: LC	
	PROJECT NO. D34301.03	DRAWING NO. 1	

MAPPED LANDSLIDES

INACTIVE FAULT
(APPROXIMATELY LOCATED)

SPRING

0 NORTH 125
APPROXIMATE SCALE
IN FEET

TRENCH B

TRENCH D

TRENCH A

TRENCH E

OVERNIGHT LODGE AREA

TRENCH C

CLUBHOUSE

PRO SHOP

Practice Facility

425 yd
Par 4
9

SITE PLAN NEW CLUBHOUSE AND OVERNIGHT LODGES CORDEVALLE GOLF AND HOTEL SAN MARTIN, CALIFORNIA	FILE NO.: N/A	DATE: 5-29-96
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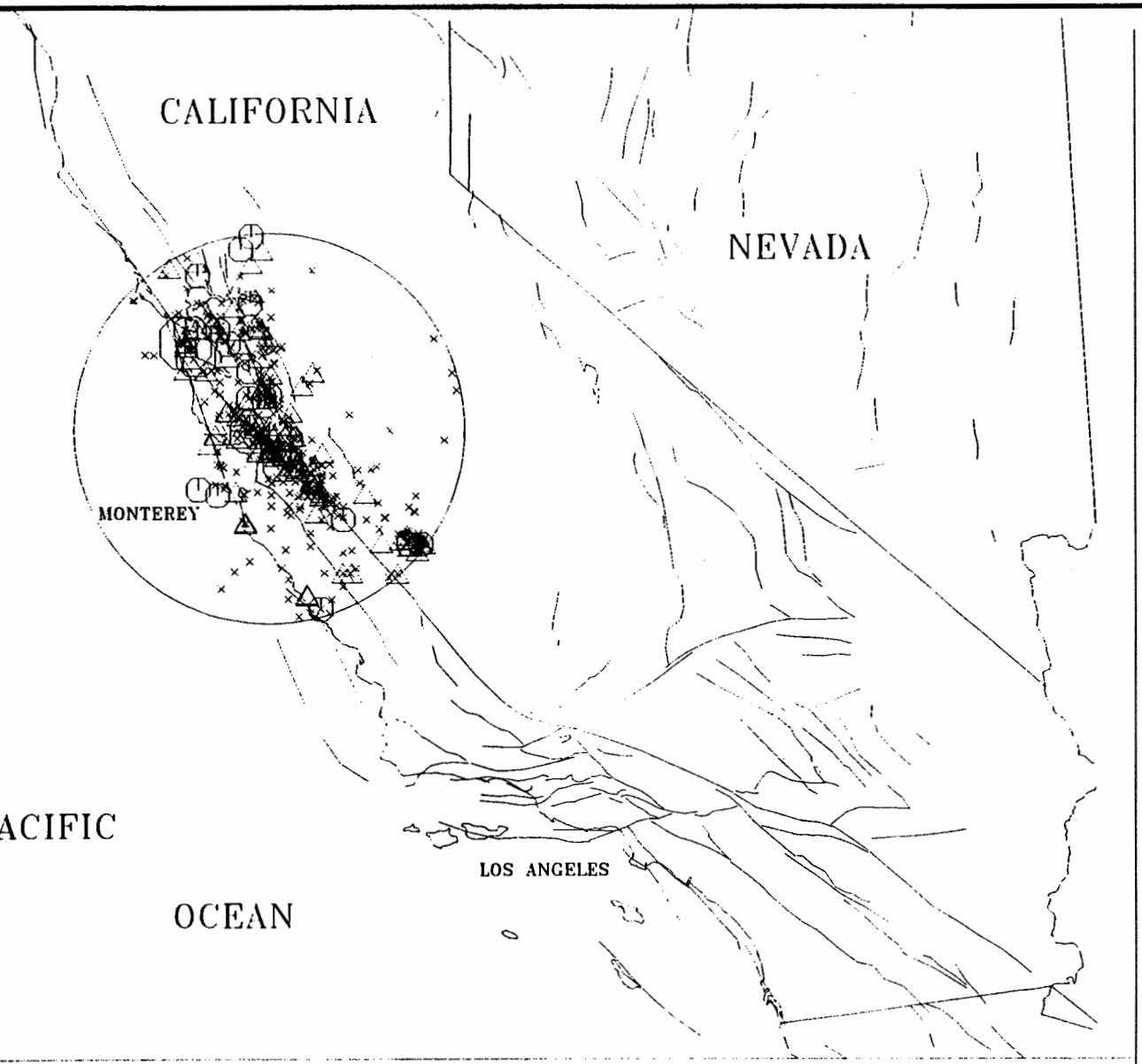
	PROJECT NO.	DRAWING NO.

THE TWINING LABORATORIES, INC.
EST. 1958



N

0 50 100

SCALE
(MILES)

EXPLANATION

M = 8.0 +

M = 7.0–7.9

M= 6.0–6.9

M = 5.0–5.9

M = 4.0–4.9

SITE LOCATION (+):

LATITUDE – 37.0678 N
LONGITUDE – 121.7000 W

HISTORICAL EARTHQUAKES 1800 TO 1996

JOB NO.: D34301.03

HISTORICAL EARTHQUAKE EPICENTER LOCATION
NEW CLUBHOUSE AND OVERNIGHT LODGES
CORDEVALLE GOLF CLUB AND HOTEL
SAN MARTIN, CALIFORNIA

FILE NO.: 34301-04	DATE: 5-29-98
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PROJECT NO. D34301.03	DRAWING NO. 3

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EST. 1898
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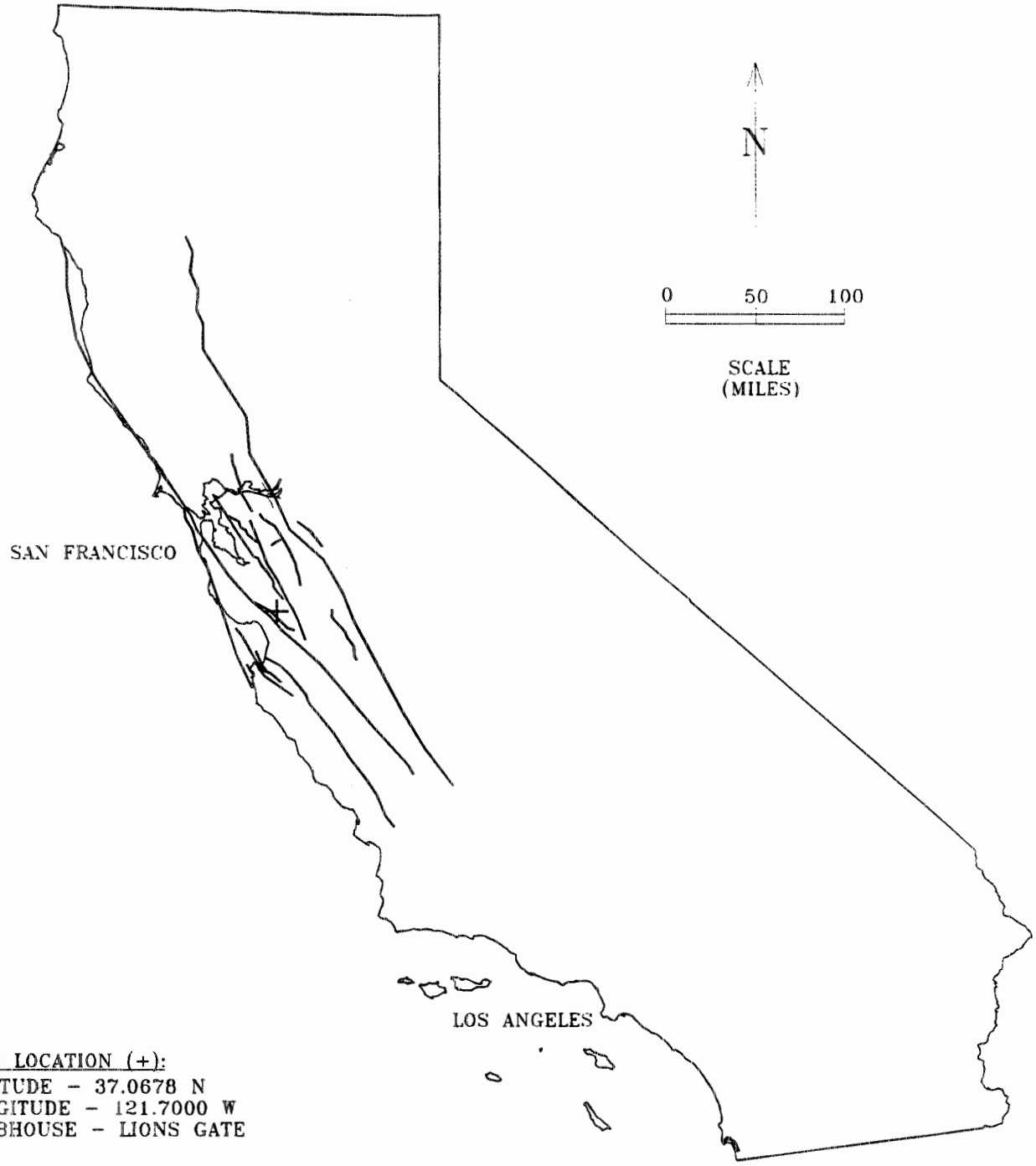

SITE LOCATION (+):
LATITUDE - 37.0678 N
LONGITUDE - 121.7000 W
CLUBHOUSE - LIONS GATE

FRISKSP FAULT MAP

JOB No: D34301.03

FAULT LOCATION MAP NEW CLUBHOUSE AND OVERNIGHT LODGES CORDEVALLE GOLF CULB AND HOTEL SAN MARTIN, CALIFORNIA	FILE NO.: 34301-03	DATE: 5-29-98
	DRAWN BY: PNG	APPROVED BY: VC
	PROJECT NO. D34301.03	DRAWING NO. 4

THE TWINING LABORATORIES, INC.
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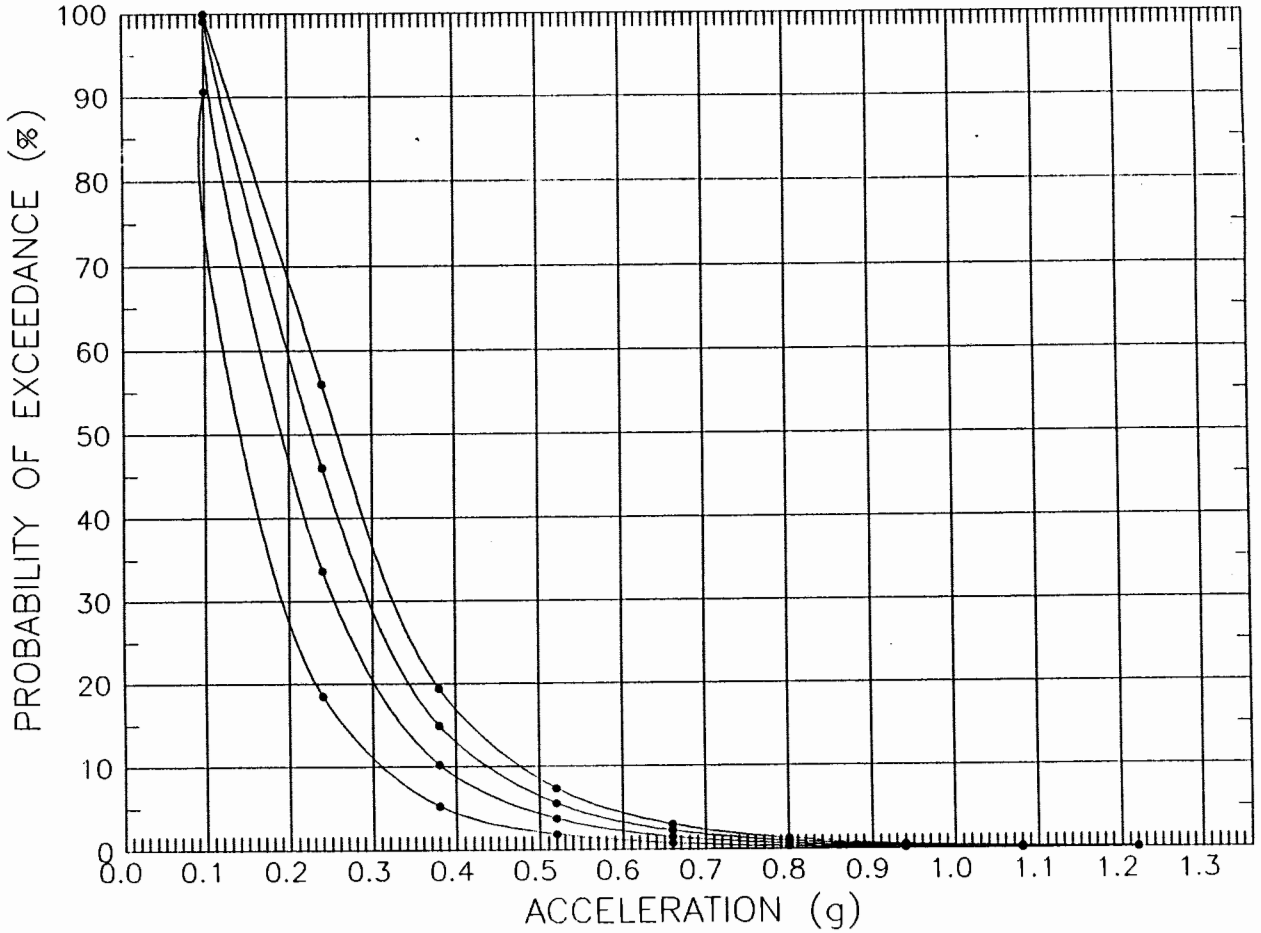
PROBABILITY OF EXCEEDANCE vs. ACCELERATION



BOORE ET AL. (1993) LRG. S – A

EXPOSURE PERIODS:

25 years	75 years
50 years	100 years

JOB No.: D34301.03

PROBABILITY OF EXCEEDANCE vs. ACCELERATION NEW CLUBHOUSE AND OVERNIGHT LODGES CORDEVALLE GOLF CLUB AND HOTEL SAN MARTIN, CALIFORNIA	FILE NO.: 34301-06 DRAWN BY: PNG PROJECT NO. D34301.03	DATE: 5-29-98 APPROVED BY: KC DRAWING NO. 5

THE TWINING LABORATORIES, INC.
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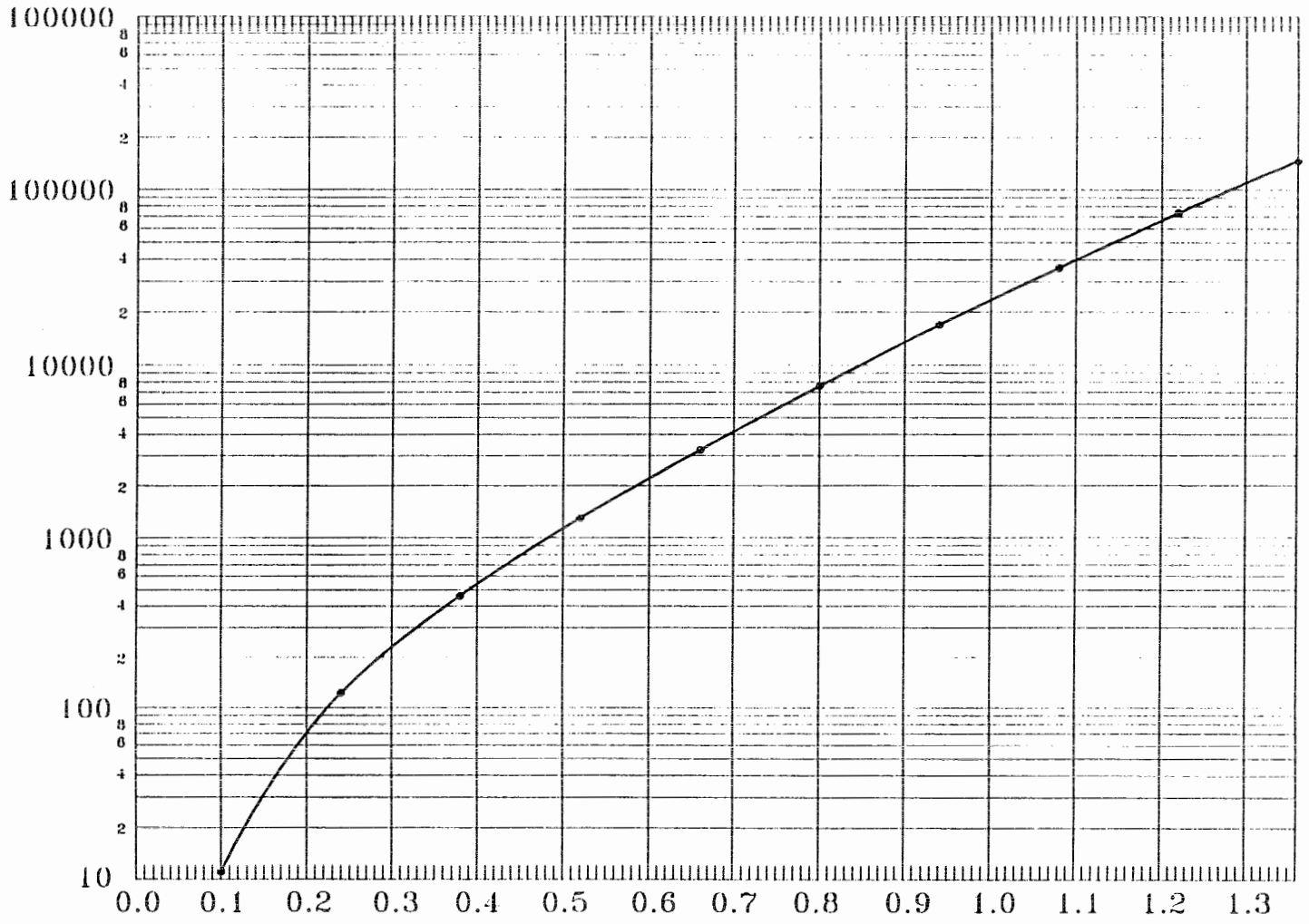
EST 1898

AVERAGE RETURN PERIOD vs. ACCELERATION



CLUBHOUSE - LIONS GATE

BOORE ET AL. (1993) LRG. S - A

JOB No.: D34301.03

AVERAGE RETURN PERIOD vs. ACCELERATION NEW CLUBHOUSE AND OVERNIGHT LODGES CORDEVALLE, GOLF CLUB AND HOTEL SAN MARTIN, CALIFORNIA	FILE NO.: 34301-05	DATE: 5-29-98
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	PROJECT NO. D34301.03	DRAWING NO. 6

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EST. 1898

APPENDIX D

Master Drainage Plan

Prepared by

Pacific Advanced Civil Engineering

January 1998 (with Addendum dated April 1998)

LION'S GATE RESERVE

MASTER DRAINAGE PLAN

Prepared by

PACE

PACIFIC ADVANCED CIVIL ENGINEERING

17902 Georgetown Lane

Huntington Beach, CA 92648

714/843-5734

Date:

January 1998

Table of Contents

INTRODUCTION

Lion's Gate Reserve, formerly know as Hayes Valley Ranch, is located at the base of Lion's Peak, 11 miles south of San Jose, adjacent to the City of Morgan Hill and approximately 2 miles west of Highway 101. Of the 1,676 acres, only approximately 420 are being developed and are located at the valley floor. The development plan for Lion's Gate Reserve includes a golf course, clubhouse, overnight lodge and 41 executive homes. The West Branch of Llagas Creek, an ephemeral stream, runs east-west through the project.

Pacific Advanced Civil Engineering, Inc. (PACE) has been retained by Hix-Rubenstein Companies to complete a Master Drainage Plan for Lion's Gate Reserve. The scope of this drainage report is to define the drainage area tributary to the project, estimate the flows and design drainage structures necessary to safely convey the flows through the project. Analysis of the golf course has been completed previously and is included in *the Lion's Gate Reserve Golf Course Drainage Report, PACE, May 1997.*

HYDROLOGY

Given the size of the watershed tributary to the project (2.37 square miles), the Corps of Engineers (COE) HEC-1 computer program was used. In general, HEC-1 is better suited for analysis of watersheds over 200 acres than other methods such as the Rational Method. The hydrology portion of this report discusses the drainage sub basin delineation and description, precipitation, soil parameters and routing used in the HEC-1 hydrologic model as well as the resulting flows that were calculated. Two separate models were created: Existing Condition and Developed Condition. The Existing Condition models the watershed under the present undeveloped conditions. The Developed Condition models the watershed assuming full residential and golf course improvements are in place.

Drainage sub-basin delineation

The drainage sub basin boundaries were developed by utilizing a 1"=400' topographic map of the project site as well as a 1"=2000' USGS map to determine any offsite flows that drain through the project site. Exhibit 1, USGS Map, located in the Appendix, shows the offsite drainage sub-basins. Exhibits 2 and 3 show the drainage sub basins for the entire watershed for the existing and developed conditions. The Tables 1 and 2 below list all the drainage basins along with area, time of concentration and Clark Storage coefficient "R" calculations (necessary for the Clark Unit Graph modeling of the drainage sub basins in the HEC-1 model). The equations used in the calculation of time of concentration and Clark storage coefficient were obtained from the Santa Clara County Water District and are shown below:

$$Tc = 0.01377\ L^{0.47}\ N^{0.47}\ S^{-0.235}$$

$$R/(R + Tc) = X$$

Where Tc = time of concentration (in hours)
L = length of drainage sub basin (in feet)
N = overall watershed roughness (resistance to overland flow)
S = drainage sub basin slope (in feet/foot)
R = Clark Storage coefficient (in hours)
X = 0.6 for rural areas

Table 1
Existing Condition Drainage Sub-Basin Description

Sub-basin	Area (mi^2)	Basin Length (ft)	Basin Slope (ft/ft)	Overland Flow Roughness N	Tc (hours)	R (hours)
1	0.1078	2100	0.1500	0.4000	0.5093	0.7639
2	0.0905	2175	0.0667	0.4000	0.6264	0.9396
3	0.0498	1800	0.1139	0.4000	0.5054	0.7580
4	0.2879	3605	0.1148	0.4000	0.6991	1.0487
5	0.0691	3085	0.1378	0.4000	0.6225	0.9337
6	0.1210	3853	0.1376	0.4000	0.6913	1.0369
7	0.1312	3500	0.1871	0.4000	0.6147	0.9221
8	0.0924	2477	0.2806	0.4000	0.4751	0.7126
9	0.0399	1170	0.1154	0.4000	0.4115	0.6172
10	0.1404	3326	0.2315	0.4000	0.5709	0.8563
11	0.0898	3640	0.0810	0.4000	0.7623	1.1434
12	0.1382	2655	0.2203	0.4000	0.5195	0.7793
13	0.0868	2750	0.2691	0.4000	0.5039	0.7559
14	0.0807	2825	0.2088	0.4000	0.5417	0.8125
15	0.0787	2200	0.0318	0.4000	0.7495	1.1242
16	0.0776	2940	0.1810	0.4000	0.5708	0.8562
17	0.1281	4050	0.0770	0.4000	0.8111	1.2167
18	0.1542	2530	0.1420	0.4000	0.5631	0.8446
19	0.0423	3000	0.1090	0.4000	0.6429	0.9737
20	0.3678	3870	0.1320	0.4000	0.6995	1.0493

Table 2
Developed Condition Drainage Sub-Basin Description

Sub-basin	Area (mi^2)	Basin Length (ft)	Basin Slope (ft/ft)	Overland Flow Roughness N	Tc (hours)	R (hours)
1	0.1078	2100	0.1500	0.3500	0.4783	0.7175
2	0.0905	2175	0.0667	0.4000	0.6264	0.9396
3	0.0498	1800	0.1139	0.3500	0.4746	0.7119
4	0.2879	3605	0.1148	0.3750	0.6782	1.0174
5	0.0691	3085	0.1378	0.3500	0.5846	0.8769
6	0.1210	3853	0.1376	0.3750	0.6706	1.0059
7	0.1312	3500	0.1871	0.3750	0.5964	0.8945
8	0.0924	2477	0.2806	0.3750	0.4609	0.6913
9	0.0399	1170	0.1154	0.3500	0.3864	0.5797
10	0.1404	3326	0.2315	0.4000	0.5709	0.8563
11	0.0898	3640	0.0810	0.3250	0.6914	1.0371
12	0.1382	2655	0.2203	0.4000	0.5195	0.7793
13	0.0868	2750	0.2691	0.3750	0.4889	0.7333
14	0.0807	2825	0.2088	0.3750	0.5255	0.7882
15	0.0787	2200	0.0318	0.3250	0.6798	1.0197
16	0.0776	2940	0.1810	0.3750	0.5537	0.8306
17	0.1281	4050	0.0770	0.4000	0.8111	1.2167
18N	0.0779	2530	0.1420	0.4000	0.5631	0.8446
18S	0.0763	2530	0.1420	0.4000	0.5631	0.8446
19	0.0423	3000	0.1090	0.2500	0.5205	0.7807
20	0.3678	3870	0.1320	0.2500	0.5609	0.8413

Precipitation

Per the *Santa Clara County Drainage Manual*, for watersheds between 200 and 2560 acres, the minimum return period for a design storm is 10 years. *Technical Paper No. 40, Rainfall Atlas of the United States, US Weather Bureau, US Department of Commerce* lists the following precipitation depths for the area.

Table 3
Rainfall Depths for Storms of Various Return Periods

Storm	Total Rainfall (in)
2 year 24-hour storm	3
5 year 24-hour storm	4
10 year 24-hour storm	5
25 year 24-hour storm	6
50 year 24-hour storm	7
100 year 24-hour storm	8

The rainfall distribution used in the HEC-1 modeling is the based on the C.O.E. standard storm.

Soils

Soil Conservation Service Soils Map for Santa Clara County indicates that the soils in the area consist of predominantly: Gilroy, Garretson, Keefers and Los Robles. *Technical Release 55, Urban Hydrology for Small Watersheds by Soil Conservation Service, US Department of Agriculture* lists these soils as belonging to hydrologic soil groups C and D. Group D soils have high runoff potential. They have very low infiltration rates when thoroughly wetted and consist chiefly of clay soils with high swelling potential, soils with permanently high water table, soils with claypan or clay layer near the surface, and shallow soils over nearly impervious material. These soils have a very low rate of water transmission (0.0-0.5 in/hr). Group C soils have a slightly lower runoff and higher infiltration rates than group D soils. Each drainage sub basin was analyzed for the soil group. The highest runoff soil group present in the sub-basin was conservatively selected as representative for the entire sub basin.

HEC-1 modeling for the watershed requires the use of SCS Curve numbers for description of the individual drainage basins within the watershed. Per *Table 5-2(a) Runoff Curve numbers for Urban Areas, Engineering Hydrology by Victor Miguel Ponce*, golf courses on group C soils with grass cover greater than 75% are considered to have an SCS curve number of 74. *Table 5-2(d) Runoff Curve Numbers for Arid and Semi Arid Rangelands* for herbaceous, mixture of grass, weeds and low growing brush with more than 70% ground cover on group C soils also have a SCS Curve number of 74. Group D soils have an SCS curve number of 85. Table 3 below lists the SCS curve numbers that were assigned to the various drainage sub basins. All areas were assumed to be 5% impervious for the existing condition. Drainage sub basins which will contain residential development and club house are assumed to be 15% impervious. For all storms events except the 100 year 24 hour storm, antecedent moisture condition AMC II (average soil moisture level) was used. For the 100 year 24 hour storm event, AMC III (wet condition) was used. The AMC III increased the SCS curve numbers from 74 and 85 to 88 and 94 respectively. Higher SCS curve numbers generate higher runoff.

Table 4
Existing Condition Soil Description

Drainage Sub Basin	Hydrologic Soils Group	Existing SCS Curve Number	AMC III Existing SCS CN	Existing Percent Impervious
1	D	85	94	5
2	D	85	94	5
3	C	74	88	5
4	D	85	94	5
5	D	85	94	5
6	D	85	94	5
7	C	74	88	5
8	C	74	88	5
9	C	74	88	5
10	C	74	88	5
11	C	74	88	5
12	C	74	88	5
13	C	74	88	5
14	C	74	88	5
15	C	74	88	5
16	C	74	88	5
17	C	74	88	5
18	D	85	94	5
19	D	85	94	5
20	C	74	88	5

Table 5
Developed Condition Soil Description

Drainage Sub Basin	Hydrologic Soils Group	Developed SCS Curve Number	AMC III Existing SCS CN	Existing Percent Impervious
1	D	85	94	15
2	D	85	94	5
3	C	74	88	5
4	D	85	94	5
5	D	85	94	5
6	D	85	94	5
7	C	74	88	5
8	C	74	88	5
9	C	74	88	5
10	C	74	88	5
11	C	74	88	5
12	C	74	88	5
13	C	74	88	5
14	C	74	88	5
15	C	74	88	15
16	C	74	88	15
17	C	74	88	5
18N	D	85	94	15
18S	D	85	94	15
19	D	85	94	15
20	C	74	88	25

Channel Routing

Runoff flows from the drainage basins were routed using the Storage Routing procedure in the HEC-1 models. Table below shows the routing parameters used in the HEC-1 model for various reaches.

Table 6
Channel Routing Parameters

Reach	Length (ft)	Slope (ft/ft)	Manning's n	Bottom width (ft)	Side Slope (H:V)
RO5	600	0.0333	0.030	20	5:1
RO7	1050	0.0140	0.030	10	5:1
RO11	1440	0.0086	0.030	10	5:1
RO10-1	2620	0.0267	0.035	20	5:1
RO10-2	3600	0.0333	0.035	15	5:1
RO9	800	0.0125	0.030	25	5:1
RO3	1000	0.0400	0.035	20	5:1
RO15	1450	0.0138	0.030	15	5:1
RO13	2500	0.0280	0.035	20	5:1
RO14	2150	0.0279	0.035	20	5:1
ROCP16	1770	0.0056	0.030	20	5:1

Flows

HEC-1 models for both the existing condition and developed condition were completed for storm events ranging from the 2 year 24 hour to the 100 year 24. Differences between the existing and developed condition models include:

1. Percent impervious
2. Time of concentration Tc and Roughness R
3. SCS curve numbers
4. Inclusion of detention areas

Runoff from each of the drainage sub basins is summarized in the table below for both existing and developed conditions for the 100 year 24 hour design storm.

Table 7
Runoff From Individual Drainage Sub-Basins for the 100 year 24 hour storm event for the Existing and Developed Conditions

Drainage Sub Basin	Existing Condition Peak Runoff (cfs)	Developed Condition Peak Runoff (cfs)
SUB1	54	54
SUB2	42	42
SUB3	24	24
SUB4	128	129
SUB5	32	33
SUB6	54	54
SUB7	59	60
SUB8	45	46
SUB9	20	20
SUB10	65	65
SUB11	38	39
SUB12	66	66
SUB13	42	42
SUB14	38	38
SUB15	34	34
SUB16	36	37
SUB17	54	54
SUB18	74	n/a
SUB18N	n/a	37
SUB18S	n/a	37
SUB19	19	21
SUB20	159	173

Peak flows in the various reaches are summarized in the table below.

Table 8
Flows in various Channel Reaches for the 100 year 24 hour storm

Reach	Existing Condition Peak Flow (cfs)	Developed Condition Peak Flow (cfs)
RO5	81	82
RO7	268	271
RO11	311	314
RO10-1	64	64
RO10-2	64	64
RO9	479	469
RO3	41	41
RO15	563	551
RO13	40	40
RO14	37	37
ROCP16	678	649
RO19	764	730

HYDRAULICS

Rainfall runoff from the project site exits the property at three locations: 1) South-east corner of the site across Turlock Avenue, 2)Llagas Creek and 3) across Coolidge Avenue north of Llagas Creek. The hydraulics section of this report analyzes the flows in the West Branch of Llagas Creek and the flows leaving Lion's Gate under existing and developed conditions.

Existing Condition

Under the existing condition, rainfall runoff confluences in two major locations: 1)West branch of Llagas Creek and 2) south-east corner of the project site. Exhibit 4 located in the Appendix shows the 100 year water surface at the project site under existing conditions.

West Branch of Llagas Creek

Flows in the West Branch of Llagas Creek traverse the middle of the project in a west to east direction. As flows reach the eastern project boundary at Coolidge Avenue, they pass under the road through a 3.5' x 6' reinforced concrete box culvert. Since the culvert is relatively small compared to the incoming 100 year flow, the creek backs up submerging the culvert and overtopping the northern bank of the channel and flooding the orchard located just north of the channel. As the flow ponds up in the orchard, it crosses Coolidge Avenue at a dip section located approximately 1,200' north of the creek. The dip section in the road has a 24" reinforced concrete pipe culvert to convey the smaller nuisance flows under the road.

To correctly assess the extent of the ponding and flooding under a 100 year storm event several different calculation and modeling procedures were completed. A HEC-RAS model was completed for the creek. Output from model (Lion8.prj) including cross-sections, profile and summary table are included in the Appendix. Since the culvert at the end of the channel has insufficient capacity to convey all of the 100 year flow (783 cfs), and from recent storm events it is known that that the creek does not overtop the road at the box culvert it, was necessary to determine the maximum flow through the culvert. The HEC-RAS model was used to calculate a rating table of water surface elevation versus flow for the culvert. The rating table is included in the Appendix. A flow of 110 cfs was assumed to pass through the culvert with the remaining 673 cfs overtopping the bank and entering the orchard. The flows that enter the orchard pond up and overtop Coolidge Avenue at the dip section some 1,200 feet to the north. It was then necessary to determine the extent of the flooding and ponding in this area. To determine the flow depth and width across Coolidge Avenue a rating table was developed. The road centerline profile was input into Flowmaster (Manning's Equation) and a critical depth and top width were calculated for various flow rates. The correct flow rate was then looked up in the HEC-1 model which includes the diversion from the creek, flows tributary to that area as well as storage effects from ponding. A flow of 797 cfs crosses Coolidge Avenue at the dip section. This flow was then looked up in the rating table which shows that the flow would be over 1,050' wide and over 6" deep.

Southeast corner of Project Site

The south east corner of the project site is a low point and the natural drainage path for the rainfall runoff of drainage sub-basin 20. As the flows pond up in the corner they enter a 16" corrugated metal pipe which coveys the flows from the project site. The flows then enter 2 12" pipes that convey the flows under Turlock Avenue. Since the 100 year flow expected in this area is 161 cfs, which is more than the capacity of the pipes, the road is overtopped. To determine the flow depth and width across Turlock Road, a rating table was developed. The road centerline profile was input into Flowmaster (Manning's Equation) and a critical depth and top width were calculated for various flow rates. The correct flow rate was then looked up in the HEC-1 model which includes the storage effects from ponding. A flow of 161 cfs crosses Turlock Road at the dip section. This flow was then looked up in the rating table which shows that the flow would be over 250' wide and 5" deep.

Developed Condition

In order to mitigate the problem of flooding and ponding at the project site, it was decided that the flows needed to be controlled and detained. A diversion channel, a detention basin and lake are proposed. These structures are intended to minimize the extent of flooding within the project boundaries as well as reduce the extent of flooding across Coolidge Avenue and Turlock Road, that exists under the present conditions. The natural flow path of the creek remains, as well as the natural crossings leaving the project site. Exhibit 5 located in the Appendix shows the proposed drainage structures as well as the 100 year water surface under developed conditions.

West Branch of Llagas Creek

As under the existing condition, the West Branch of Llagas Creek is the main runoff conveyance system for the project. To mitigate the problem of flooding at the orchard which presently exists, a diversion channel is proposed to parallel the creek. Since a road is proposed to cross the creek at approximately station 21+13, only 2 24" pipes are proposed to be placed there. The remainder of the flow is expected to cross under the road further south through a larger culvert, and parallel the creek. The proposed culvert is a concrete arch bridge with a 24' span and 8' rise. The creek is to remain as is, and will continue to covey flows during all storm events. The difference is that the flows during larger storm events will be lower. The proposed diversion channel is to be trapezoidal with 3:1 side slopes, a bottom width of 10', and be grass lined. The diversion channel and the creek confluence at the culvert at Coolidge Avenue. Since the Coolidge Avenue culvert is not capable of conveying the runoff from larger storm events, a side spillway is proposed to route the flows north, into the proposed Coolidge Detention Basin. The spillway is set at elevation 272.7 and is 200' in length. The calculated depth of flow over the spillway is 1.1'. Calculations are included in the Appendix. The maximum water surface in the detention basin is set at elevation 273' allowing for a 25% submergence of the weir. The detention basin outflow is through a 18" low flow outlet pipe and a 83'

spillway set at elevation 271'. The detention basin outlets at the dip section at Coolidge Avenue where it leaves the project site. The basin is designed to intercept the diverted flows from the creek as well as flows from drainage sub-basin 18S. Flows from drainage sub-basin 18N go around the northern edge of the detention basin, to the dip section at Coolidge Avenue, where they confluence with the outflow from the basin. These flow paths are included in the developed condition HEC-1 model dev100.hc1 located in the Appendix. The detention basin design is summarized in the table below.

Table 9
Coolidge Avenue Detention Basin Summary Table

Storm Event	Peak Inflow (cfs)	Peak Outflow (cfs)	Peak Storage (AF)	Peak Stage (feet)
100-year storm	674	663	23	273.00
10-year storm	261	254	18	272.03
2-year storm	63	15	9	269.70

The table shows that only a minor reduction in flow across the road is attained for the 10 and 100 year storms. The significant reduction in flows leaving the property over Coolidge avenue will be achieved for storm events more frequent than the 10 year storm.

To obtain a water surface profile for the West Branch of Llagas Creek a HEC-RAS model was completed. The model includes the proposed diversion channel. Output from the HEC-RAS model lion14.prj including profile, cross-sections and summary table are included in the Appendix.

Since the peak flow over Coolidge Avenue is known, the rating table for the Coolidge avenue crossing was consulted and the flow depth and width over the road was obtained. The flow was found to be 753 cfs with a flow top width of over 1,050' and depth of over 6".

Southeast Corner of Project Site

The natural flow path of drainage sub-basin 20 continues to be the south east corner of the project site under developed condition. The developed condition includes a 16 acre lake which serves as a detention basin. The normal water surface for the lake is set at elevation 275' with the 100 year water surface set at elevation 277.99'. The lake has a peak storage of 50 acre feet. Flows leave the lake over a 54' spillway set at elevation 277' and enters a swale which conveys the flow to the southeast corner of the project. The spillway has a 2' notch set at elevation 275.5' to allow the lake to empty to within 6" of its normal water surface following a storm. The swale itself has a minor flow attenuation

effect as the flows pond up in the southeast corner prior to leaving the project site. The swale has a 15' spillway set at elevation 276'and a 16" RCP for a low flow outlet set at elevation 272'.Both the lake and swale are included in the developed condition HEC-1 model dev100.hc1 which is included in the Appendix. Tables 10 and 11 summarize the flow through the lake and swale.

Table 10
Lake Summary Table

Storm Event	Peak Inflow (cfs)	Peak Outflow (cfs)	Peak Storage (AF)	Peak Stage (feet)
100-year storm	173	144	50	277.99
10-year storm	85	41	40	277.43
2-year storm	40	6	25	276.53

Table 11
Swale Summary Table

Storm Event	Peak Inflow (cfs)	Peak Outflow (cfs)	Peak Storage (AF)	Peak Stage (feet)
100-year storm	144	128	22	277.96
10-year storm	41	28	11	276.49
2-year storm	6	6	0	272.69

Since the storage volume available in the lake and swale is small when compared to the volume of the incoming 100 year storm event, only a small reduction in peak flow is attained. However, the 10 and 2 year storm event peak flows are reduced by 67% and 85% respectively. Once the flow out of the swale was calculated, the rating table for the Turlock Road dip section was consulted for the flow top width and depth. The 100 year flow top width calculated was 250' with a maximum flow depth of about 4".

SUMMARY

The purpose of this drainage report is to quantify and characterize the storm runoff flows through the project site under present conditions, and design the drainage structures necessary to minimize onsite flooding and eliminate any increase in runoff leaving the project site as a result of development. The drainage infrastructure proposed includes a diversion channel to divert larger flows from the West Branch of Llagas Creek and route them through the proposed Coolidge Avenue Detention Basin eliminating flooding in the orchard and reducing the flow over Coolidge Avenue. Also included is a lake which intercepts and detains flows from drainage sub-basin 20 and reduces the flows crossing Turlock Road. The natural drainage paths for storm runoff that leave the project site remain in place. Given the large volume of the 10 and 100 year storm events in comparison to the available storage volume in the proposed lake and Coolidge Detention Basin, only a minor flow attenuation is obtained for these storm events. For more frequent storm events the reduction in flow is much more significant. The table below compares the flows leaving the property between the existing and developed conditions for the 2, 10 and 100 year storm events.

Table 12
Comparison of Existing and Developed Discharges Leaving the Property

	Existing Condition			Developed Condition			
	Flow (cfs)	Top Width of flow over road (ft)	Depth of flow over road (ft)	Flow (cfs)	Top Width of flow over road (ft)	Depth of flow over road (ft)	Percentage Flow Reduction
Coolidge Avenue Dip Section							
100 year	797	1050+	0.6	753	1050+	0.6	6%
10 year	332	980	0.4	294	800	0.4	11%
2 year	86	290	0.2	32	150	0.1	63%
Coolidge Avenue Box Culvert							
100 year	110	n/a	n/a	110	n/a	n/a	0%
10 year	110	n/a	n/a	110	n/a	n/a	0%
2 year	110	n/a	n/a	110	n/a	n/a	0%
Turlock Avenue Dip Section							
100 year	161	260	0.4	128	245	0.3	20%
10 year	73	210	0.3	28	110	0.1	62%
2 year	31	120	0.2	6	n/a	n/a	81%

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HEC-1 Flood Hydrograph Package Users Manual, US Army Corps of Engineers, Hydrologic Engineering Center, 09/1990

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NOTE

The technical appendices and full scale exhibits of the Master Drainage Plan are not included in this EIR Addendum. These are contained in the full Master Drainage Plan document which is available for review at the County of Santa Clara Advance Planning Office.

ADDENDUM TO LION'S GATE RESERVE MASTER DRAINAGE PLAN

Prepared by

PACIFIC ADVANCED CIVIL ENGINEERING
17902 Georgetown Lane
Huntington Beach, CA 92648
714/843-5734

Date

April 1998

Table Of Contents

I. Introduction

This addendum to the Lion's Gate Master Drainage Plan (MDP), December 1997, covers the design of the A Street and Highland Avenue Bridges, as well as the design of the diversion structure. The analysis and design of these structures was not included in the original MDP. The hydraulic models included in this addendum supersede all hydraulic models in the MDP, and are to be considered final. Also included in this addendum are calculations for golf course drainage piping.

II. Diversion Structure

The proposed diversion structure, to be located approximately between stations 2449 and 2180, serves to divert a portion of the flow from the existing creek into the proposed diversion channel. The diversion channel parallels the existing creek through the orchard. The proposed diversion channel was necessary to mitigate the flooding problems resulting from the existing creek's insufficient conveyance capacity, in the area of the orchard. Major storm event flows regularly overtop the creek banks and flood the orchard. The design of the diversion channel is included in the main body of the Lion's Gate Master Drainage Plan. The design of the diversion structure is included in this addendum.

For environmental reasons, the existing creek will still convey flows during all storm events. The diversion structure serves to divert major flows from the existing creek into the proposed diversion channel, thereby eliminating flooding in the orchard area. This mitigation was accomplished by proposing two separate structures. First, at the A Street crossing, two 24" reinforced concrete pipes serve as a culvert and convey the flows under A Street to the existing creek during all storm events. The culvert, due to its relatively small conveyance capacity, also serves to back up the water in the West Branch of Llagas Creek, upstream of A Street. This backwater effect forces the water to spill over the side weir spillway diversion structure, into the proposed diversion channel. This proposed diversion structure is a side spillway, to be constructed as a rip rap reinforced berm, with the top of spillway set at elevation 279'. The expected water surface in this area is 283'. Plan and cross-section views of the proposed diversion structure are shown on Exhibit 4. The spillway is to be 75' in length. To verify that the spillway has a sufficient capacity to convey the flows, a weir calculation is included in the Appendix.

III. Bridges

The design of the A Street and Highland Avenue Bridges is included in this section of the addendum. The design was completed utilizing the HEC-RAS computer program. The hydraulic model used in the Lion's Gate Master Drainage plan was modified to include the two proposed bridges. Output from the HEC-RAS computer model (Lion15.prj) including a summary table, profile and cross-sections is included in the Appendix. To accurately size the bridges, scour calculations were also completed. The bridge design is summarized in the table below. The proposed bridges are cast-in place concrete arch bridges by Con Arch, Inc. A minimum of 2 feet of freeboard is provided between the water surface and bridge soffit.

	Highland Avenue Bridge	A Street Bridge
Station	3728	2161
Channel Invert Elevation	287.91	276.73
Calculated Bridge Scour (feet)	4.5	6.3
Bridge Footing Elevation	283.5	270.50
Flow Depth (feet)	3.26	6.3
Calculated Water Surface Elevation	291.17	282.01
Proposed Bridge Arch Height & Span	14.5 x 42	13.5 x 24
Bridge Soffit Elevation	298	284
Roadway Elevation	301	287
Available Freeboard (feet)	6.83	2.00

IV. GOLF COURSE DRAINAGE PIPING

The overall grading and pipe placement for the golf course was designed by the architect, Robert Trent Jones II, to convey nuisance flows through the course to the West Branch of Llagas Creek. Sizing of the pipes was completed by PACE and is summarized by the following:

For flow analysis of the golf course drainage pipes, both HEC-1 and the rational method was utilized. Tributary areas to each pipe inlet were determined. If the tributary area to a pipe corresponded to one of the drainage sub-basins delineated for the HEC-1 model, then the flows from the model were utilized to size the pipe. Otherwise, per the Santa Clara County Drainage Manual the following equation was used:

$Q = RCIA$

Where R = 1 (Table 6)
Assuming a 100-year design storm
I = 1.75 (per Figure 10)
C = 0.2 + 0.15 + 0.05 + 0.1 = 0.5 (per Table 4)
A = drainage area in acres

The equation simplifies to $Q = 0.875\ A$.

Using Mannings Equation, pipe sizes were determined based on the assigned flows and the slopes. All pipes were designed to be partially full.

Piping Calculation Summary

Pipe Num.	Trib. Area (acres)	100-Yr. Flow (cfs)	Pipe Dia. (in)	Num. of Inlets	Inlet Size (in)	Slope (ft/ft)	Depth of Flow (ft)	Velocity (ft/s)
1	36.00	31.50	24	-	-	0.056	0.94	21.60
2	0.61	32.03	24	1	10	0.025	1.22	15.96
3	9.03	7.90	15	3	18	0.012	0.90	8.37
4	2.73	10.29	18	2	12	0.010	0.97	8.49
5	2.01	12.05	18	1	12	0.010	1.09	8.72
6	5.99	5.25	12	2	18	0.088	0.43	16.32
7	1.86	6.87	15	1	12	0.030	0.60	11.68
8	1.03	7.77	15	1	12	0.008	1.07	6.96
9	2.86	2.50	12	1	18	0.061	0.32	11.66
10	1.32	3.66	12	1	12	0.050	0.41	12.05
11	10.03	193.18	2-36	-	-	0.025	1.86	21.01
12	2.02	182.19	2-36	-	-	0.025	1.79	20.75
13	97.34	174.42	2-36	-	-	0.025	1.67	20.27
14	3.15	89.25	36	-	-	0.020	1.90	18.92
15	98.85	86.49	36	-	-	0.017	1.97	17.62

16	1.47	1.29	8	1	12	0.070	0.26	10.50
17	0.92	2.09	8	1	12	0.029	0.45	8.43
18	1.18	3.12	10	1	12	0.020	0.55	8.16
19	8.76	10.79	18	-	-	0.025	0.75	12.22
20	2.53	2.21	10	-	-	0.040	0.36	9.78
21	3.04	2.66	10	1	12	0.017	0.52	7.35
22	0.20	2.84	10	1	8	0.018	0.54	7.67
23	0.53	3.30	10	1	8	0.022	0.55	8.57
24	0.63	3.85	12	1	8	0.035	0.47	10.71
25	1.12	4.83	12	1	10	0.013	0.76	7.57
26	0.69	0.60	6	1	10	0.010	0.35	4.15
27	0.28	0.85	8	1	8	0.025	0.27	6.45
28	4.11	3.60	12	-	-	0.018	0.55	8.20
29	1.74	1.52	8	1	12	0.011	0.51	5.31
30	2.83	4.00	12	2	12	0.010	0.72	6.64
31	0.64	4.56	12	1	10	0.010	0.81	6.72
32	2.39	2.09	12	1	12	0.018	0.40	7.13
33	3.50	13.85	18	-	-	0.025	0.87	12.97
34	1.44	15.11	24	-	-	0.030	0.75	14.13
35	8.65	7.57	15	2	18	0.042	0.58	13.54
36	0.71	8.19	15	1	10	0.032	0.66	12.46
37	7.38	49.47	30	-	-	0.057	1.08	24.32
38	2.13	51.34	30	1	12	0.030	1.33	19.31
39	2.42	2.12	10	1	12	0.024	0.41	8.01
40	1.42	1.24	8	1	12	0.020	0.35	6.59
41	1.39	4.58	12	1	12	0.015	0.68	8.04
42	38.93	34.83	24	-	-	0.067	0.95	23.69
43	0.87	0.76	6	1	10	0.190	0.17	13.29
44	0.92	0.81	8	1	10	0.045	0.22	7.87
45	16.96	14.84	18	-	-	0.142	0.55	25.18
46	14.91	29.62	24	-	-	0.090	0.80	25.31
47	1.98	16.58	18	1	12	0.075	0.70	20.93
48	0.53	0.46	8	1	8	0.009	0.26	3.70
49	0.42	0.37	8	1	8	0.043	0.15	6.19
50	0.36	1.15	10	1	8	0.032	0.27	7.55
51	0.38	0.32	6	1	8	0.051	0.15	6.50
51A	-	20.00	21	-	-	0.058	1.29	10.53
52	0.67	20.90	21	1	8	0.023	1.05	13.91
53	1.44	23.31	24	1	12	0.016	1.37	10.15
54	0.49	0.43	6	1	8	0.036	0.19	6.22
55	3.57	26.86	30	2	12	0.010	1.26	10.88
56	1.29	1.12	8	1	10	0.053	0.25	9.14
57	0.65	27.42	30	1	10	0.010	1.27	10.94
58	0.90	29.35	30	1	10	0.010	1.32	11.12
59	0.62	0.55	6	1	8	0.020	0.26	5.34
60	0.84	0.74	6	1	10	0.010	0.42	4.23
61	0.41	0.35	6	1	8	0.013	0.23	3.99
62	0.84	0.73	6	1	10	0.012	0.38	4.58

63	0.73	0.63	6	1	10	0.038	0.23	6.99
64	0.65	0.57	6	1	8	0.010	0.33	4.11
65	2.8	2.45	10	2	12	0.010	0.60	5.87
66	6.6	8.25	15	2	18	0.010	1.01	7.80
67	0.56	0.49	6	1	8	0.010	0.30	3.98
68	0.65	9.31	18	1	10	0.010	0.91	8.31
69	1.27	1.11	8	1	12	0.010	0.41	4.88
70	21.12	18.48	24	2	24	0.010	1.15	9.89
71	0.54	20.07	24	1	10	0.010	1.21	10.07
72	7.03	6.15	15	2	18	0.010	0.79	7.47
73	-	59	24	-	-	0.048	1.51	23.21
74	1.3	1.14	8	-	12	0.026	0.31	7.10
75	0.62	1.68	10	-	10	0.050	0.29	9.85
76	13.04	11.41	15	3	18	0.035	0.79	14.01
77	0.74	0.64	6	-	10	0.041	0.23	7.28
78	1.66	13.5	18	-	12	0.040	0.74	15.41
79	2.11	1.85	8	-	12	0.147	0.25	15.18
80	1.27	2.96	8	-	12	0.186	0.31	18.74
81	1.29	4.08	10	-	12	0.179	0.33	19.94
82	1.84	5.69	10	-	12	0.083	0.51	16.27
83	1.36	6.88	12	-	12	0.053	0.58	14.46
84	0.54	0.47	6	-	10	0.067	0.17	7.97
85	0.68	1.06	6	-	10	0.055	0.29	9.14
86	1.51	9.26	15	-	12	0.019	0.84	10.57
87	10.85	9.5	12	2	24	0.110	0.57	20.59
88	0.51	9.95	15	-	10	0.038	0.71	13.91
89	4.07	13.51	18	2	12	0.010	1.22	8.81

Depending on the pipe location, it was either sized with grated drain inlets or headwalls. Drain piping outlets will discharge into Llagas Creek through outlet structures. A rip rap outlet structure detail is shown on Exhibit 5.

APPENDIX F

Biological Report

Prepared by

H.T. Harvey & Associates

May 1998

H.T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS

29 May 1998

Mr. Bert Verrips
Nolte and Associates, Inc.
1 N. First Street, Suite 450
San Jose, CA 95113
voice: 510.652.1666
facsimile: 510.547.6677

SUBJECT: Hayes Valley (Lions Gate): reconnaissance-level biotic constraints survey

Dear Mr. Verrips:

We have finished our reconnaissance-level field survey of the project modification areas. Three specific areas were surveyed, including: (1) the newly-proposed location of the clubhouse, (2) creek by-pass channels, and, (3) new location of the stable/corral complex. The purpose of our survey was to determine if these proposed changes to the original project resulted in significant impacts to biotic resources on site. Survey personnel included Dr. Patrick Boursier, plant ecologist. A detailed project description and field review of each location was supplied by Mr. Ron Davis. All of these three sites occur within the project boundaries intensively surveyed by H. T. Harvey & Associates staff in 1994-95 in preparation of our report entitled *Hayes Valley, Biological Resources Report* (30 Nov 95; PN 385-11). Each of the project modification sites are discussed below.

1. Clubhouse Site: The proposed location is within habitat previously identified in our report as non-native annual grassland situated near the confluence of two riparian corridors. It is our understanding that no trees will be removed within this area, the previously-approved riparian setback distance of 75 feet will be maintained, the creek crossing will occur at the same location as that initially proposed for the golf cart path crossing, however, the crossing will be widened somewhat to accommodate two-lane traffic. One two-lane bridge crossing is to be removed. This proposed modification will not result in any additional direct or indirect impacts to biotic resources.
2. Creek By-pass Channel: The by-pass channel occurs within the portion of the project site originally identified as agricultural, situated along Highland Avenue near its intersection with Coolidge Avenue. It is understanding that water from the native channel will be diverted above the 2.3-year flood event, all existing riparian vegetation will remain, water will be placed into a series of on-site retention basins. This proposed modification will not result in any additional direct or indirect impacts to biotic resources.

3. Stable/Corral Complex: The access road and stable/corral complex occurs within a habitat identified in our 1995 report as non-native annual grassland. The access road will utilize a currently-existing, unimproved dirt road. The access road will cross two seasonal drainage channels with existing culvert and/or bridge crossings. These crossings will be upgraded to handle increased traffic and may result in relatively minor impacts to seasonal wetland habitats within one of the drainages (on the order of 10-25 square feet). This proposed modification will not result in any additional direct or indirect impacts to biotic resources.

In summary, the proposed modifications discussed above will not result in significant impacts to existing biological resources, beyond those already identified and addressed in the approved Environmental Impact Report.

If you our your staff have any questions please feel free to contact me or Rick Hopkins.

Sincerely,

Patrick J. Boursier, Ph.D.
Division Head, Botany and Wetlands

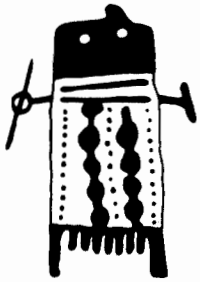
APPENDIX G

Archaeological Report

Prepared by

Basin Research Associates

May 1998



29 May, 1998

BASIN
RESEARCH
ASSOCIATES

1933 DAVIS STREET
SUITE 210
SAN LEANDRO, CA 94577
VOICE (510) 430-8441
FAX (510) 430-8443

Mr. Bert Verrips
Nolte and Associates
1 North First Street
Suite 450
San Jose, CA 95113

RE: Review of Previous Cultural Resources Studies
Proposed Location of Club House, Horse Stables and Creek Bypass Channel
Lions Gate/Cordevalle Project, Santa Clara County

Dear Mr. Verrips,

Please let this letter serve as our review of the proposed location changes for the Club House and Horse Stables as well as the addition of a Creek Bypass Channel for the above project.

As you are aware, the project is situated in an area which has undergone a number of archival reviews and archaeological inventories as a result of cultural resource compliance requirements. Four archaeological sites, CA-SCl-76, SCl-77, SCl-305/H and SCl-568, have been recorded within the boundaries of the proposed project although only one prehistoric site, CA-SCl-76, was relocated during the various field programs. This site was also the subject of a presence/absence testing program to determine its horizontal and vertical extent [Fig. 1]. The three other reported sites for the project area, CA-SCl-77, SCl-305/H and SCl-568, did not have any visible surface indicators of a prehistoric occupation at their recorded location nor did auger testing expose the presence of subsurface cultural materials at their reported locations.

A review of the archival material on file at our office for the project indicates that none of the planned changes for the location of the Club House and Horse Stables will affect any known cultural resources. The Creek Bypass Channel is in the immediate and near vicinity of CA-SCl-76.

It is Basin Research Associates' considered opinion that the construction planned for the project can proceed as planned. No further archaeological research appears necessary and monitoring during subsurface construction at the Club House and Horse Stables does not appear warranted. However, archaeological monitoring of the first three to five feet of subsurface trenching for the Creek Bypass Channel is recommended by a professional archaeologist. The frequency and duration of the monitoring should be at the discretion of the archaeologist and dependent on his/her subsurface observations during trenching.

It is also recommended that if any unanticipated prehistoric or significant historic era cultural materials are exposed during construction, operations should stop within 20 feet of the find and a qualified professional archaeologist contacted for evaluation and further recommendations. Potential recommendations could include evaluation, collection, recordation, analysis, etc. of any

significant cultural materials followed by a professional report.[1]

If I can provide any additional information or be of further service please don't hesitate to contact me.

Sincerely yours,
BASIN RESEARCH ASSOCIATES, INC.

Colin I. Busby
Principal

CIB/dg

---

1. Significant prehistoric cultural resources are defined as human burials, features or other clusterings of finds made, modified or used by Native American peoples in the past. The prehistoric and protohistoric indicators of prior cultural occupation by Native Americans include artifacts and human bone, as well as soil discoloration, shell, animal bone, sandstone cobbles, ashy areas, and baked or vitrified clays. Prehistoric materials may include:

    a. Human bone - either isolated or intact burials.
    b. Habitation (occupation or ceremonial structures as interpreted from rock rings/features, distinct ground depressions, differences in compaction (e.g., house floors).
    c. Artifacts including chipped stone objects such as projectile points and bifaces; groundstone artifacts such as manos, metates, mortars, pestles, grinding stones, pitted hammerstones; and, shell and bone artifacts including ornaments and beads.
    d. Various features and samples including hearths (fire-cracked rock; baked and vitrified clay), artifact caches, faunal and shellfish remains (which permit dietary reconstruction), distinctive changes in soil stratigraphy indicative of prehistoric activities.
    e. Isolated artifacts

    Historic cultural materials may include finds from the late 19th through early 20th centuries. Objects and features associated with the Historic Period can include.

    a. Structural remains or portions of foundations (bricks, cobbles/boulders, stacked field stone, postholes, etc.).
    b. Trash pits, privies, wells and associated artifacts.
    c. Isolated artifacts or isolated clusters of manufactured artifacts (e.g., glass bottles, metal cans, manufactured wood items, etc.).
    d. Human remains.

    In addition, cultural materials including both artifacts and structures that can be attributed to Hispanic, Asian and other ethnic or racial groups are potentially significant. Such features or clusters of artifacts and samples include remains of structures, trash pits, and privies.

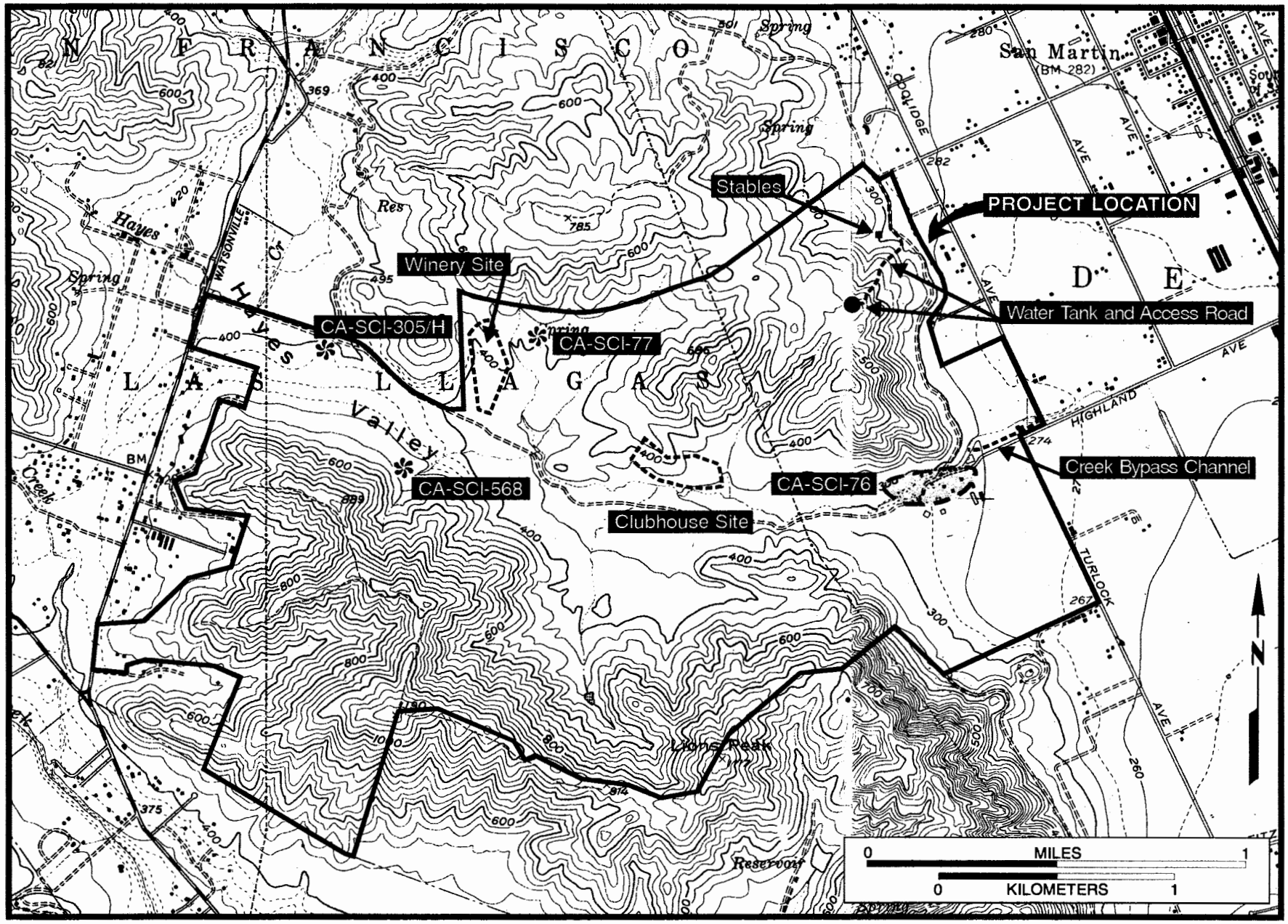


Figure 1: Project Location with Archaeological Sites and Planned Changes (USGS Mt. Madonna, Calif. 1980 and Gilroy, Calif. 1981)

APPENDIX H

Traffic Report

Prepared by

TJKM Transportation Consultants

May 1998

TJKM Transportation Consultants

May 27, 1998

Mr. Bert Verrips
Nolte Associates
1 North First Street, Ste 450
San Jose, CA 95113

Subject: Traffic Impact due to Incremental Square Footage in Restaurant Space at the Proposed Hayes Valley Country Club in the County of Santa Clara

Dear Mr. Verrips:

TJKM Transportation Consultants is pleased to present this traffic evaluation based on changes to the development proposal since our February 1996 traffic study report on the proposed Hayes Valley development. The new proposal calls for the restaurant space in the golf club house facility to be roughly 5,800 square feet as opposed to 4,000 square feet as was previously proposed. This letter report presents our evaluation of the impact of that incremental development. In summary, the impact of the additional space is negligible. No change in intersection delay or level of service occurs.

Note that this analysis uses the same trip generation and capacity analysis methodologies as the previous study. This is done to maintain consistency with this study despite minor recent changes in the ITE trip generation rates and the adoption by the county of new capacity analysis software.

Previous Impacts

In our earlier study, the proposed project was not found to have significant impacts at any of five study intersections:

1) Santa Teresa Boulevard/Sunnyside Avenue/Watsonville Road
2) Coolidge Avenue/San Martin Avenue
3) Monterey Road/San Martin Avenue
4) Santa Teresa Boulevard/Highland Avenue
5) Monterey Road/San Martin Avenue

In fact, even in the ultimate scenario which evaluated Existing plus Approved plus Proposed Project Traffic plus Expected Growth, only the p.m. peak conditions at the intersection of Monterey Road/San Martin Avenue fell below LOS B (at LOS C-).

Impact of Incremental Development

In order to determine whether the additional restaurant space, roughly 2,000 square feet, would produce an impact it is only necessary to add the incremental traffic generation and re-evaluate the project impact. Because the most project traffic is routed through the intersection of Monterey Road/San Martin Avenue, and this is the most congested intersection, a determination that there would be no p.m. peak impact at that intersection is a necessary and sufficient condition of determining that there would be no impact at any location.

Using the trip generation assumptions of our previous analysis, the incremental trip generation due to the additional restaurant space would consist of 2 additional trips in the a.m. peak (1 in, 1 out) and 15 additional trips in the p.m. peak (10 in, 5 out). The 15 p.m. trips are of importance here -- 12 p.m. peak trips would be assigned to Monterey Road/San Martin Avenue. Assigning this additional traffic to the intersection and replicating the capacity analysis from the previous study reveals that all measures of delay and level of service are unchanged from the previous study (24 seconds of delay, LOS C-). Detailed calculation sheets from the latest analysis and the previous study are presented in Attachment A.

Conclusion

As has been shown, the impacts of the previous study are not changed given the additional restaurant space, the conclusion of no impact and therefore no mitigation measures also holds.

I hope that this analysis has been helpful. If there are any questions or comments, please feel free to give me a call.

Sincerely,

Michael Carroll
Transportation Engineer

rhm
Attachments
146-026l.1mc

Attachment A

Detailed Calculation Sheets

C A P S S I
COMPREHENSIVE ANALYSIS PROGRAM
FOR A SINGLE SIGNALIZED INTERSECTION *

Santa Clara County
EX + AP + PR + EXPECTED GROWTH
SOLUTION USING REQUIRED CYCLE TIME

11-16-95
Previous Proposal

FLN:3eg_p
Scenario 1

3. Monterey/San Martin P.M Peak Hour

Movement	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Phase 1 - 43 secs	X	X	X	.	.	.	X	X	X	.	.	.
Phase 2 - 5 secs	.	.	.	.	X	.	.	.	.	.	X	.
Phase 3 - 13 secs	.	.	.	X	X	X	.	.	.	.	.	.
Phase 4 - 26 secs	.	.	.	X	.	X	.	.	.	X	.	X
Phase 5 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 6 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Critical Mvmt-**					****		****			****		
Peak 15 Vol -vph	86	17	16	519	222	41	82	175	253	426	12	188
Saturation -vph	1000	Shrd	1800	3600	1700	1800	1300	Shrd	Shrd	3600	1700	Shrd
Lost time -sec	4.00	-	2.00	6.00	4.00	2.00	4.00	-	-	6.00	4.00	-
Relative Sat 'X'	0.23	-	0.02	0.38	0.81	0.05	0.88	-	-	0.74	0.61	-
Effective Gr-sec	39	-	41	33	14	37	39	-	-	20	1	-
Move Time -sec	43	-	43	39	18	39	43	-	-	26	5	-
Min/Ped Time-sec	26	-	26	26	4	26	26	-	-	26	4	-
Prog Factor PAF	1.00	-	1.00	1.00	1.00	1.00	1.00	-	-	1.00	1.00	-
AvDelay/veh -sec	11	-	9	15	38	11	26	-	-	26	60	-
Level of Service	B-	-	B+	B-	D-	B-	D+	-	-	D+	F	-
Av.'Q'/ lane veh	1	-	0	4	5	1	7	-	-	6	0	-
Veh Stopping %	62	-	53	73	97	59	91	-	-	93	100	-
Do Veh Clear ?	YES	-	YES	YES	YES	YES	YES	-	-	YES	YES	-

Whole Intersection - Weighted Av Delay (sec) = 24 Level of Service = C-
Critical Movements - Weighted Av Delay (sec) = 28 Level of Service = D+
'' '' - Intersection Capacity Utilization (ICU) = 0.83

Required Cycle Length is 87 seconds (All Minimum times are satisfied)

* CAPSSI (Release 11) - Based on Delay Methodology Per 1985 Highway Capacity Manual

C A P S S I
COMPREHENSIVE ANALYSIS PROGRAM
FOR A SINGLE SIGNALIZED INTERSECTION *

05-26-98 Revised Proposal

SOLUTION USING PREDETERMINED CYCLE TIMES

monterey/san martin — A.M Peak Hour — FLN:rico Scenario 1

Movement	EBT	EBL	EBR	SBT	SBL	SBR	WBT	WBL	WBR	NBT	NBL	NBR
Phase 1 - 45 secs	X	X	X	.	.	.	X	X	X	.	.	.
Phase 2 - 5 secs	.	.	.	.	X	.	.	.	.	.	X	.
Phase 3 - 13 secs	.	.	.	X	X	X	.	.	.	.	.	.
Phase 4 - 24 secs	.	.	.	X	.	X	.	.	.	X	.	X
Phase 5 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Phase 6 - 0 secs	.	.	.	.	.	.	.	.	.	.	.	.
Critical Mvmt-**					****		****			****		
Peak 15 Vol -vph	87	17	16	520	222	41	83	180	253	427	12	191
Saturation -vph	1000	Shrd	1800	3600	1700	1800	1300	Shrd	Shrd	3600	1700	Shrd
Lost time -sec	4.00	-	2.00	6.00	4.00	3.00	4.00	-	-	6.00	4.00	-
Relative Sat 'X'	0.22	-	0.02	0.41	0.81	0.06	0.84	-	-	0.83	0.61	-
Effective Gr-sec	41	-	43	31	14	34	41	-	-	18	1	-
Move Time -sec	45	-	45	37	18	37	45	-	-	24	5	-
Min/Ped Time-sec	20	-	20	20	0	20	20	-	-	20	0	-
Prog Factor PAF	1.00	-	1.00	1.00	1.00	1.00	1.00	-	-	1.00	1.00	-
AvDelay/veh -sec	10	-	9	16	38	13	23	-	-	31	60	-
Level of Service	B-	-	B+	C+	D-	B-	C-	-	-	D	F	-
Av.'Q'/ lane veh	1	-	0	4	5	1	7	-	-	6	0	-
Veh Stopping %	59	-	51	75	97	62	88	-	-	96	100	-
Do Veh Clear ?	YES	-	YES	YES	YES	YES	YES	-	-	YES	YES	-

Whole Intersection - Weighted Av Delay (sec) = 24 Level of Service = C-
Critical Movements - Weighted Av Delay (sec) = 29 Level of Service = D+
" " - Intersection Capacity Utilization (ICU) = 0.83

Predetermined Cycle Length is 87 seconds (Min. times may not be satisfied)

* CAPSSI (Release 11) - Based on Delay Methodology Per 1985 Highway Capacity Manual

APPENDIX I

Noise Report

Prepared by

Illingworth & Rodkin

May 1998

ILLINGWORTH & RODKIN, INC.
Acoustics • Air Quality

May 29, 1998

Bert Verrips
Nolte & Associates
1 North First Street, Suite 450
San Jose CA 95113

Subject: Hayes Valley Ranch EIR

Dear Bert:

This letter is in response to the proposed change in the clubhouse location at Hayes Valley Ranch. The clubhouse under the current plan would be moved approximately 600 feet closer to the home located on the ridge to the east of the Hayes Valley. Noise generated at the clubhouse area would be perceived at a level about 2 decibels louder than the location farther from the home. The resulting level would not be noticeably different than generated at the previous location and the resulting noise levels would be within the range predicted at our previous study as noted in our letter dated February 5, 1996.

Sincerely,

Richard R. Illingworth, PE

RRI:lk
(95-012)

85 Bolinas Road, #11 • Fairfax, California 94930 • (415) 459-5507 • FAX (415) 459-6448

THIRD ADDENDUM TO

ENVIRONMENTAL IMPACT REPORT

LION'S GATE RESERVE

(CordeValle)

LEAD AGENCY: COUNTY OF SANTA CLARA

File #4039-67-28-93
SCH #94043016

October 1998

TABLE OF CONTENTS*

* The contents only include sections of the EIR that have been revised in this Addendum.

INTRODUCTION

Description of Project Modifications

This Third EIR Addendum has been prepared to address the changes to the Lion's Gate Reserve (CordeValle) project that have been proposed since the time that the EIR on the project was certified by the County Board of Supervisors in August 1996, and since the first EIR Addendum was prepared in January 1997 and the second EIR Addendum was prepared in June 1998.

The main changes to the project addressed in this EIR Addendum include the addition of two new project elements as follows: 1) construction of a winery/grape processing center on approximately 18 acres in the northwest portion of the site; 2) installation of a 400,000-gallon water storage tank (with maintenance access road and water pipeline) in the northeast portion of the site. These new project elements are described in detail below, followed by a summary evaluation of potential impacts resulting from these new facilities. The changes to the EIR resulting from these project elements are addressed in the body of this addendum.

New Winery Facility

The Lion's Gate project was approved by the County of Santa Clara subject to a condition that approximately 82.5 acres of the project's designated permanent open space area be planted in vineyards. In order to process the grapes from this on-site vineyard, the applicant proposes to construct a winery/grape processing center on approximately 18 acres in the northwest portion of the site, north of the golf course maintenance facility. Having the winery/processing center on-site would eliminate the need to truck grapes off-site for processing.

The land to be occupied by the winery has been removed from the permanent open space area of the Lion's Gate/CordeValle project and incorporated into the parcel containing the golf course and related facilities. (This aspect of the winery project was previously addressed in the Second Addendum to the EIR of June 1998).

The winery site is a located on gently sloping terrain covered in annual grasses and a few scattered oaks. The winery facilities would include a 25,000 square-foot production facility, which would be equipped for all phases of the wine-making process and would include administrative offices, meeting rooms, and a reception area. The winery's architectural image is planned to be of high quality and would complement the style of the larger project. Building materials would primarily consist of stucco walls and tile roofs, with some external elements clad in stone veneer. The facility would include a grape receiving area at the north end of the winery building and a truck dock at the south end for receiving barrels and shipping finished product. Twenty parking spaces would be provided for employees and visitors. A landscaped berm would be installed east of the winery building to screen the parking area from view of the nearby golf course.

The facility would include a 5,000 square-foot stand-alone structure for the storage and maintenance of mobile vineyard equipment. The equipment storage building would be located just north of the golf course maintenance facility and would not include fuel storage tanks. Fuel for the winery equipment would be obtained from the golf course maintenance facility.

Access to the winery would be exclusively from the controlled access maintenance road to Watsonville Road, and would include a 20-foot wide crushed gravel driveway extending north from the golf course maintenance facility.

The winery would be equipped for all phases of the wine-making process including crushing, fermentation, barrel aging, and bottling. The production capacity of the facility is estimated to be 45,000 cases per year, which is sufficient to process the grapes from approximately 100 acres of vineyards, and would be adequate to handle the annual grape harvest from the site. The winery would have approximately 8 full-time staff, with an additional 6 temporary workers employed each fall for the harvest and crush.

The winery would include a hospitality area that would be open to trade representatives and the public by invitation only. A small tasting room for the winery would also be included in the main golf course clubhouse complex and would be open to golf course guests only.

The traffic generated by the winery would include trips by employees and visitors, as well as about 40 truck trips to transport finished product (cases of wine) which would occur periodically throughout the year. In comparison, if all the grapes grown on-site had to be trucked to off-site processing centers, this would involve approximately 200 truck loads using 18-wheeled trucks.

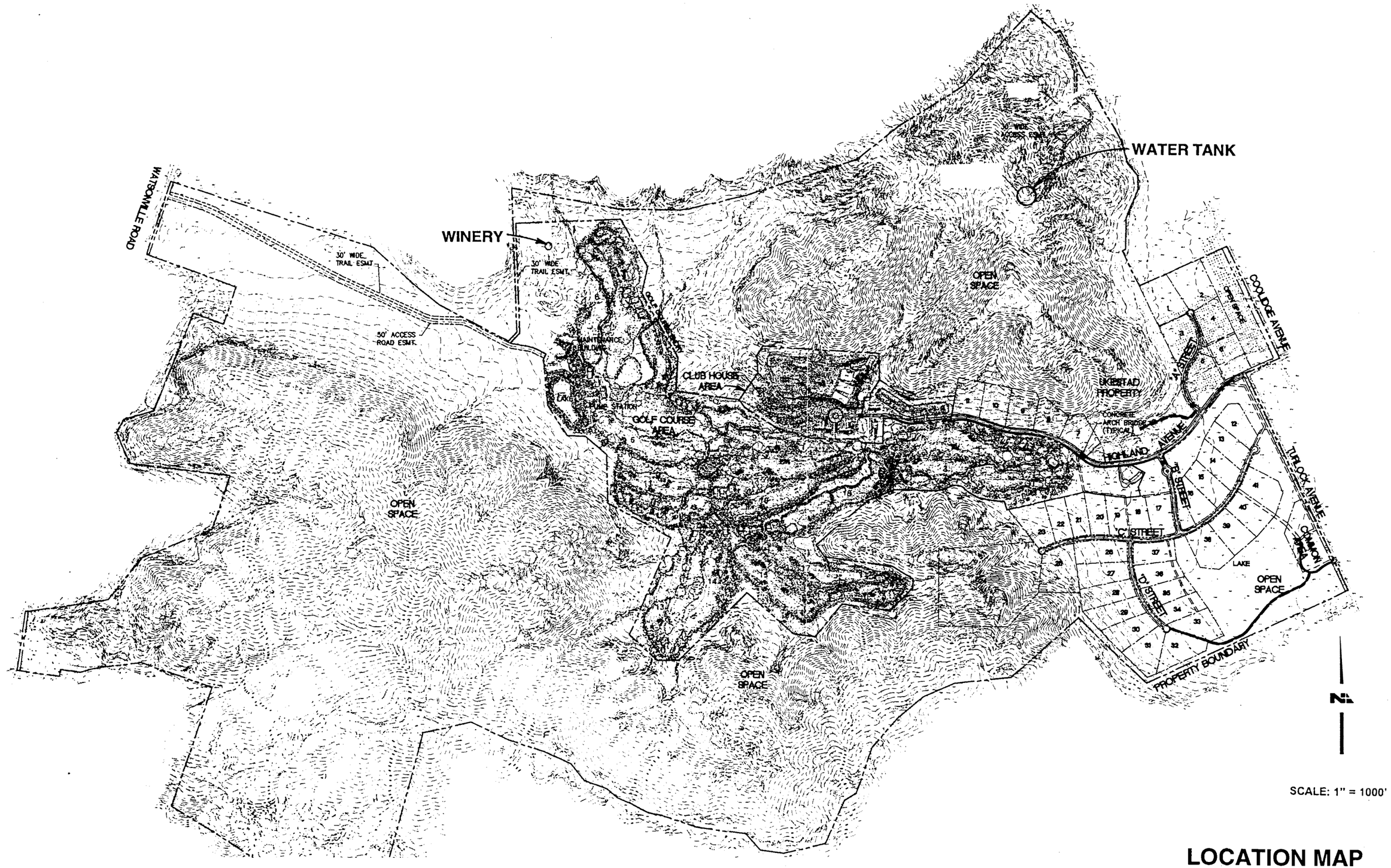
The winery would utilize approximately 700,000 gallons of non-potable water per year (which represents approximately 0.5 percent of total project water use). Most of this water would be used for irrigating the vineyard, although a small portion would be used for washing down the vats and equipment at the winery. This non-potable water would be obtained from the golf course irrigation reservoir located south of the golf course maintenance facility. Use of domestic water at the winery would relatively minor and the water would be obtained from the water line serving the golf course maintenance facility.

Current plans are to treat domestic wastewater generated by the winery at a new septic tank and leachfield system south of the winery building. Alternatively, wastewater from the winery would be piped to the septic system at the maintenance facility. The siting and design of the septic tank and leachfield system would be subject to the criteria and standards of the Santa Clara County Department of Environmental Health.

Washdown water from cleaning the vats and equipment would be screened for solids and then piped to two small treatment ponds occupying a 0.5-acre area south of the winery building. This washdown water would include some residue from cleaning detergents and minor amounts of chemicals used in the wine making process. The treatment ponds would include aerators to prevent stagnation and odor generation, which would also prevent mosquito breeding. Some of the treated washwater would evaporate at the ponds and the remainder would be used for irrigation or frost protection in the vineyards. The organic material screened from the washwater would be applied on the vineyards or would be used in making mulch for soil amendment. The treatment ponds would include landscaped berms to the east and west to screen them from view of the golf course and winery access road, respectively. The design and installation of the wastewater treatment ponds would be subject to the approval of the Central Coast Regional Water Quality Control Board.

Various chemicals are used in the wine making process and detergents are used for cleaning the vats and equipment. None of these substances would be used in significant quantities and therefore would not require a hazardous materials permit. The used chemicals and cleaning detergents would be piped with the washwater to the on-site treatment ponds.

Grading for the winery facilities and access road would include cuts and fills of up to about 8 feet, and would involve approximately 11,300 cubic yards of cut and 14,800 cubic yards of fill. The 3,500 cubic yards of fill to be brought to the site would be obtained from surplus earthwork from other areas of the CordeValle project. Retaining walls would be required at several locations primarily to prevent tree removal along the winery access road and around the winery building. The height of the retaining walls would vary with the



LOCATION MAP

Source: PACE Engineering

terrain and would be no higher than about 8 feet. No trees would be removed as a result of constructing the winery facility.

The access road and drainage facilities for the winery would be designed by a qualified civil engineer in accordance with County requirements and standards. Electric power and telephone service would be extended underground to the winery from the golf course maintenance facility. Fire hydrants would be provided in conformance with the requirements of the County Fire Marshal's Office.

Water Storage Tank

A new 400,000-gallon domestic water storage tank for the West San Martin Water Works is planned for the upper elevations in the northeast portion of the site. This tank is needed to provide adequate water pressure and fire flows to the Lion's Gate project, and would also improve fire flows for existing residences east of the project site.

The maintenance access road to the tank would commence from the western extension of San Martin Avenue and would follow an existing dirt track up the hillside to the tank site. The new water main from the tank would be installed in the tank access road to the toe of the eastern hillside where it would split into two mains heading north and south. The southern main would follow the base of the hill to the residential portion of the CordeValle project located north of Highland Avenue. The northern main would follow the maintenance access road to San Martin Avenue where it would tie into an existing water line.

The water tank site is located on an broad eastward sloping swale just below the ridgeline. The tank would be 70 feet in diameter and 34 feet high, with approximately one-half of the overall tank height located below adjacent native ground level. The tank walls would be reinforced concrete supported on a spread foundation, and the tank would have an aluminum domed roof which would be rigidly connected to the tank walls.

Cuts of up to 23 feet would be required to achieve a level pad for the tank. The tank foundation would bear entirely on cut. A french drain would be installed outside the perimeter of the tank to control subsurface drainage.

The tank site takes advantage of existing trees to provide visual screening from the valley floor to the east. Additional trees would be planted as needed to increase visual screening. No trees would be removed for the tank, access road, or water mains.

Summary Evaluation of Potential Impacts Resulting from Winery and Water Tank

The proposed winery and water tank would not result in any new significant environmental impacts compared with the project evaluated in the EIR. The environmental effects of the new project elements are briefly evaluated below.

Land Use: The winery and water tank represent a very minor addition in square footage of the project, and would not significantly increase the land use intensity of what is already a very low density development. The winery and water tank sites are not adjacent to existing off-site development, and as discussed under 'Aesthetics' below, would be visible only in the distance from a few existing residences. Since the winery and water tank would not result in significant land use impacts, no changes are required to EIR Section *III. A. Land Use.*

Agriculture: The winery would provide a facility for processing grapes from the vineyards that were stipulated as a mitigation for loss of prime farmland in the EIR. The EIR Section *III. B. Agriculture* has been amended to include mention of the winery's role in processing the grapes produced on-site.

Parks, Recreation and Open Space: As discussed in the second EIR Addendum of June 1998, the removal of the winery site from the project's permanent open space area would result in a very small reduction of the open space area. However, the total open space allocation of the project still exceeds the 1,226 acres required to fulfill the 90 percent open space requirement for the Hillside cluster subdivision. The winery site is located in close proximity to the on-site segment of the San Martin Cross-Valley Trail which will run along the northern project boundary. The winery site has been designed to leave a strip of permanent open space between the winery site and northern and western site boundary that is of ample width to accommodate the 30-foot wide cross-site trail easement. The water tank would have no impact on the cross-site trail or any other open space amenity. The water tank and related facilities are also located well away from the cross-site trail easement and would not have a significant impact on recreation and open space. No changes are required to EIR Section *III. C. Parks, Recreation and Open Space.*

Geology and Soils: The sites of the winery and water tank were evaluated for geologic constraints by Twining Laboratories in October 1998. The study found that there are no earthquake faults or bedrock fault contacts in the vicinity of either the winery or the water tank sites. Likewise, there are no landslides in the vicinity of the winery or water tank, and the native slopes in the vicinity of both facilities appear relatively stable. Neither site is susceptible to liquefaction or seismic settlement, and both sites are located well away from the mapped area of serpentine bedrock located elsewhere on the Lion's Gate site. The near-surface soils at both the winery and water tank sites have medium potential for soils expansion. This would not pose a problem at the water tank site since the tank site will be subexcavated well below the surface soil. At the winery site, mitigation for expansive soils would consist of overexcavation for footings and floor slabs. Shallow groundwater is present at the water tank site, which would be mitigated by the installation of proper surface and subsurface drainage facilities. The winery site does not appear to be subject to high groundwater. The EIR Section *III. D. Geology and Soils* has been amended to incorporate the pertinent findings of the Twining report, insofar as these issues have not already been covered in the EIR. The Twining report is included in Appendix C of this EIR Addendum.

Hydrology and Drainage: No part of either the winery or water tank sites are located within or across existing drainage courses. The winery site is located west of an intermittent drainage courses in the northwestern portion of the project. Proper drainage facilities for the winery site will be designed by a civil engineer in accordance with County requirements. The water tank is located at the head of a swale just below a broad ridgeline. The tank site has a tributary drainage area of only 3.0 acres, so minimal storm flow will pass through the tank vicinity. The tank site will be designed to convey surface and subsurface drainage around the tank to the swale below. Neither the winery nor water tank would result in significant increases in site runoff or alteration of site drainage patterns. No changes are required to the EIR Section *III. E. Hydrology and Drainage.*

Water Quality: The water tank and winery facilities would result in relatively small areas of additional paved surfaces where non-point pollutants could accumulate and wash off to the adjacent watershed. These effects are adequately covered in the existing EIR Section *III. E. Water Quality.* (See 'Wastewater Treatment and Disposal' below for discussion of treatment and disposal of domestic wastewater and washdown water.)

Biological Resources: The proposed winery and water tank elements (including the tank access road and pipeline alignments) have been evaluated by H.T. Harvey and Associates. The biologists surveyed the sites and

found no sensitive species or habitats that would be affected by these new project elements. No trees would be removed as a result of either of these new project elements. Therefore, the winery and water tank would result in no new potential impacts to biological resources. No changes are required to EIR Section *III. F. Biological Resources*. The letter report prepared by Harvey and Associates which addresses these new project elements is contained in Appendix F of this EIR Addendum.

Archaeology: The winery and water tank facilities (including the tank access road and pipeline alignment) are not within areas of archaeological sensitivity and there are no known archaeological resources in the vicinity of these sites. Therefore, the winery and water tank would result in no new potential impacts to archaeological resources. No changes are required to the EIR Section *III. E. Archaeology*. A letter report on these project elements prepared by Basin Research Associates is contained in Appendix G of this EIR Addendum.

Aesthetics: The winery site is located in the northwest corner of the project site where it is all but invisible from public vantage points. The winery would only be visible from a single residence on the off-site ridge to the north, at a distance of at least 2,000 feet. The winery would be designed to conform to the architectural style of the CordeValle clubhouse complex, and no trees would be removed for the winery. The water tank would be installed at a relative high elevation; however, the visibility of the tank would be minimized by its location in a broad swale just below the ridgeline. Approximately one-half of the tank would be buried so only the upper portion of the tank would extend above ground elevation. The tank site takes advantage of existing trees to provide visual screening from the valley floor. Additional trees would be planted as needed to increase visual screening. The tank may be partially visible in the distance from the valley floor to the east and also from some residences in the Hayes Valley Ranch to the north and west, which would be at least 2,000 feet away. Thus neither the winery nor the water tank would result in significant visual impacts. The EIR Section *III. J. Visual and Aesthetics* has been modified to include discussions of the winery and water tank.

Traffic: The traffic generated by the winery would include trips by employees and visitors, as well as about 40 truck trips to transport finished product (cases of wine), which would occur periodically throughout the year. There would also be occasional trips by delivery vehicles. This level of trip generation would not have a significant effect on traffic operations along Watsonville Road. The EIR Section *III. K. Traffic and Circulation* has been amended to include a discussion of traffic generated by the winery.

Noise: Neither the winery nor the water tank would result in significant new operational noise sources. The winery operation would be conducted entirely indoors, including the crushing of grapes during the harvest season. There would be occasional noise generated by trucks traveling to the winery, but this noise would not be audible from off-site locations. The operation of the water tank likewise would not generate noise audible from off-site locations, and truck traffic from maintenance vehicles visiting the tank would be infrequent. Therefore, no changes would be made to the EIR Section *III. L. Noise* with respect to operational noise.

The construction noise generated during installation of the winery and the water tank would be noticeable but not significant at the nearest residences which are located at least 1,000 feet away in both cases. Construction of the portion of the tank access road along the base of the hillside may temporarily elevate noise levels at the nearest residences to the east along the western extension of San Martin Avenue. These residences would also be subject to temporary noise from truck traffic generated during the construction of the water tank. This may result in a short-term noise impact at these residences, although the impact would be mitigated by measures contained in the EIR. The EIR Section *III. L. Noise* has been amended to include a discussion of this potential construction noise impact.

Air Quality: The slight increase in traffic resulting from the addition of the winery facility would cause a very small increase in the generation of vehicle emissions. However, according to air quality consultant M'OC Physics Applied, this increase would not be significant in terms of either local carbon monoxide concentrations or in term of pollutants of regional concern. No changes are required to EIR Section *III. M. Air Quality*. The winery operation would not result in the creation of noxious odors. The grape crushing would occur entirely within the winery building, and the fermentation process would occur in fully enclosed vats. At close range the winery would exude the pleasant smell of oak and fruit. However, at the nearest residence located at least 1,000 feet north no winery odors would be detectable.

Hazards: Various chemicals would be used in the wine making process and detergents would be used for cleaning of the vats and equipment. In addition, small amounts of oils and lubricants would be used by the vineyard tractors and equipment (fuel would be obtained from the nearby golf course maintenance facility). These chemicals or hydrocarbons would not be used in significant quantities and therefore would not require a hazardous materials permit. No changes to the EIR Section *III. N. Hazardous Materials, Public Health and Safety* are required.

Water Supply: The winery would use approximately 210 gallons of domestic water daily for the maximum of 14 staff who would be on-site during the harvest and crush. In addition, a daily average of approximately 2,000 gallons of non-potable water would be used for washing down the vats and equipment. This additional water consumption represents less than 0.5 percent of the total water consumption estimate for the CordeValle project and would be readily accommodated by the surplus water supply available to the project as calculated in the EIR. The EIR Section *III. P. Water Supply* has been amended to include the additional water demand for the winery.

Wastewater Treatment and Disposal: Current plans are to treat domestic wastewater generated at the winery at a new septic tank and leachfield system to be located south of the winery building. However, wet weather percolation tests have not yet been conducted to determine whether on-site soils are suitable for leachfields. Alternatively, wastewater from the winery would be piped to the septic system at the nearby golf course maintenance facility. The siting and design of the septic tank and leachfield system would be subject to the criteria and standards of the Santa Clara County Department of Environmental Health.

Washdown water from cleaning the vats and equipment would be screened for solids and then piped to two small treatment ponds occupying a 0.5-acre area south of the winery building. The treatment ponds would include aerators to prevent stagnation and odor generation, which would also prevent mosquito breeding. Some of the treated washwater would evaporate at the ponds, and the remainder would be used for irrigation or frost protection in the vineyards. The organic material screened from the washwater would be applied to the vineyards or used in making mulch for soil amendment. The design and installation of the wastewater treatment ponds would be subject to the approval of the Central Coast Regional Water Quality Control Board. The EIR Section *III. Q. Wastewater Treatment and Disposal* has been amended to include a discussion of wastewater treatment and disposal for the winery.

Rationale for Preparation of an EIR Addendum

This document has been prepared in accordance with the requirements of the California Environmental Quality Act (CEQA) which sets forth specific requirements for the documentation of potential environmental impacts which may result from modifications made to a proposed project after an EIR on the project has been certified. Under these circumstances, Sections 15162 through 15164 of the CEQA Guidelines provide for the preparation of one of three types of documents depending on the situation. The criteria to be met for each type of document

are as follows: 1) a 'Subsequent EIR' shall be prepared if the changes to the project are substantial, and will result in major revisions to the EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; 2) a 'Supplement to an EIR' shall be prepared if the conditions described in #1 above apply but only minor changes or revisions to the EIR are necessary; and 3) an 'Addendum to an EIR' shall be prepared if some minor changes and additions are necessary, but the conditions which would necessitate the preparation of a Supplement to an EIR are not present. In the present case, the proposed modifications may or may not be considered substantial, but in no instance would new significant environmental effects be involved or the severity of a significant effect be increased substantially, as discussed above and in the body of this document. In addition, the changes to the EIR required to address the proposed project modifications are minor in nature. Thus two of the required criteria for preparing a Subsequent EIR and one of the required criteria for preparing a Supplement to an EIR would not apply. Therefore, according to CEQA criteria noted above, the type of environmental document that should be prepared in this instance is an 'Addendum to an EIR'.

Organization of This Document

Since this is the Third Addendum to the EIR, this document identifies revisions to the certified EIR, as modified by the First and Second Addendums, which reflect the changes in project description and environmental analysis resulting from the proposed modifications to the project. In order to facilitate the reader's comprehension without having to refer back to the certified EIR and the previous Addendums, this document contains the affected portion of the EIR to provide a context for the text changes. Revisions to the text are indicated by ~~strikethrough~~ for deletions and underline for additions.

I. PROJECT DESCRIPTION

*

*

B. DESCRIPTION OF THE PROPOSED PROJECT

Overview

1. ~~A~~ Use Permit applications for a public access championship golf course, including a clubhouse with restaurant, 45 units of overnight accommodations, a practice range, a maintenance facility, ~~and~~ a swim and tennis center, a winery/grape processing center, and a water storage tank.

*

*

Winery/Grape Processing Center

In order to process the grapes from the on-site vineyards, the applicant proposes to construct a winery/grape processing center in the northwest portion of the site, north of the golf course maintenance facility. Having the winery/processing center on-site would eliminate the need to truck grapes off-site for processing.

The winery site comprises approximately 18 acres of gently sloping terrain covered in annual grasses and a few scattered oaks (see Figures 9a, 10e and 10f). The winery facilities would include a 25,000 square-foot production facility, which would be equipped for all phases of wine making and would include administrative offices, meeting rooms, and a reception area. The winery's architectural image is planned to be of high quality and would complement the style of the larger project. Building materials would primarily consist of stucco walls and tile roofs, with some external elements clad in stone veneer. The facility would include a grape receiving area at the north end of the winery building and a truck dock at the south end for receiving barrels and shipping finished product. Twenty parking spaces would be provided for employees and visitors. A landscaped berm would be installed east of the winery building to screen the parking area from view of the nearby golf course.

The facility would include a 5,000 square-foot stand-alone structure for the storage and maintenance of mobile vineyard equipment. The equipment storage building would be located just north of the golf course maintenance facility and would not include fuel storage tanks. Fuel for the equipment would be obtained from the golf course maintenance facility.

Access to the winery would be exclusively from the controlled access maintenance road to Watsonville Road, and would include a 20-foot wide crushed gravel driveway extending north from the golf course maintenance facility.

The winery would be equipped for all phases of the wine-making process including crushing, fermentation, barrel aging, and bottling. The production capacity of the facility is estimated to be 45,000 cases per year, which is sufficient to process the grapes from approximately 100 acres of vineyards, and would be adequate to handle the annual grape harvest from the site. The winery would have approximately 8 full-time staff, with an additional 6 temporary workers employed each fall for the harvest and crush.

The winery would include a hospitality area that would be open to trade representatives and the public by invitation only. A small tasting room for the winery would also be included in the main golf course clubhouse complex and would be open to golf course guests only.

The traffic generated by the winery would include trips by employees and visitors, as well as about 40 truck trips to transport finished product (cases of wine) which would occur periodically throughout the year. In comparison, if all the grapes grown on-site had to be trucked to off-site processing centers, this would involve approximately 200 truck loads using 18-wheeled trucks.

The winery would utilize approximately 700,000 gallons of non-potable water per year (which represents approximately 0.5 percent of total project water use). Most of this water would be used for irrigating the vineyard, although a small portion would be used for washing down the vats and equipment at the winery. This non-potable water would be obtained from the golf course irrigation reservoir located south of the golf course maintenance facility. Use of domestic water at the winery would relatively minor and the water would be obtained from the water line serving the golf course maintenance facility.

Current plans are to treat domestic wastewater generated by the winery at a new septic tank and leachfield system south of the winery building. Alternatively, wastewater from the winery would be piped to the septic system at the maintenance facility. The siting and design of the septic tank and leachfield system would be subject to the criteria and standards of the Santa Clara County Department of Environmental Health.

Washdown water from cleaning the vats and equipment would be screened for solids and then piped to two small treatment ponds occupying a 0.5-acre area south of the winery building. This washdown water would include some residue from cleaning detergents and minor amounts of chemicals used in the wine making process. The treatment ponds would include aerators to prevent stagnation and odor generation, which would also prevent mosquito breeding. Some of the treated washwater would evaporate at the ponds and the remainder would be used for irrigation or frost protection in the vineyards. The organic material screened from the washwater would be applied on the vineyards or would be used in making mulch for soil amendment. The treatment ponds would include landscaped berms to the east and west to screen them from view of the golf course and winery access road, respectively. The design and installation of the wastewater treatment ponds would be subject to the approval of the Central Coast Regional Water Quality Control Board.

Various chemicals are used in the wine making process and detergents are used for cleaning the vats and equipment. None of these substances would be used in significant quantities and therefore would not require a hazardous materials permit. The used chemicals and cleaning detergents would be piped with the washwater to the on-site treatment ponds.

Grading for the winery facilities and access road would include cuts and fills of up to about 8 feet, and would involve approximately 11,300 cubic yards of cut and 14,800 cubic yards of fill. The 3,500 cubic yards of fill to be brought to the site would be obtained from surplus earthwork from other areas of the CordeValle project. Retaining walls would be required at several locations primarily to prevent tree removal along the winery access road and around the winery building. The height of the retaining walls would vary with the terrain and would be no higher than about 8 feet. No trees would be removed as a result of constructing the winery facility.

The access road and drainage facilities for the winery would be designed by a qualified civil engineer in accordance with County requirements and standards. Electric power and telephone service would be extended underground to the winery from the golf course maintenance facility. Fire hydrants would be provided in conformance with the requirements of the County Fire Marshal's Office.

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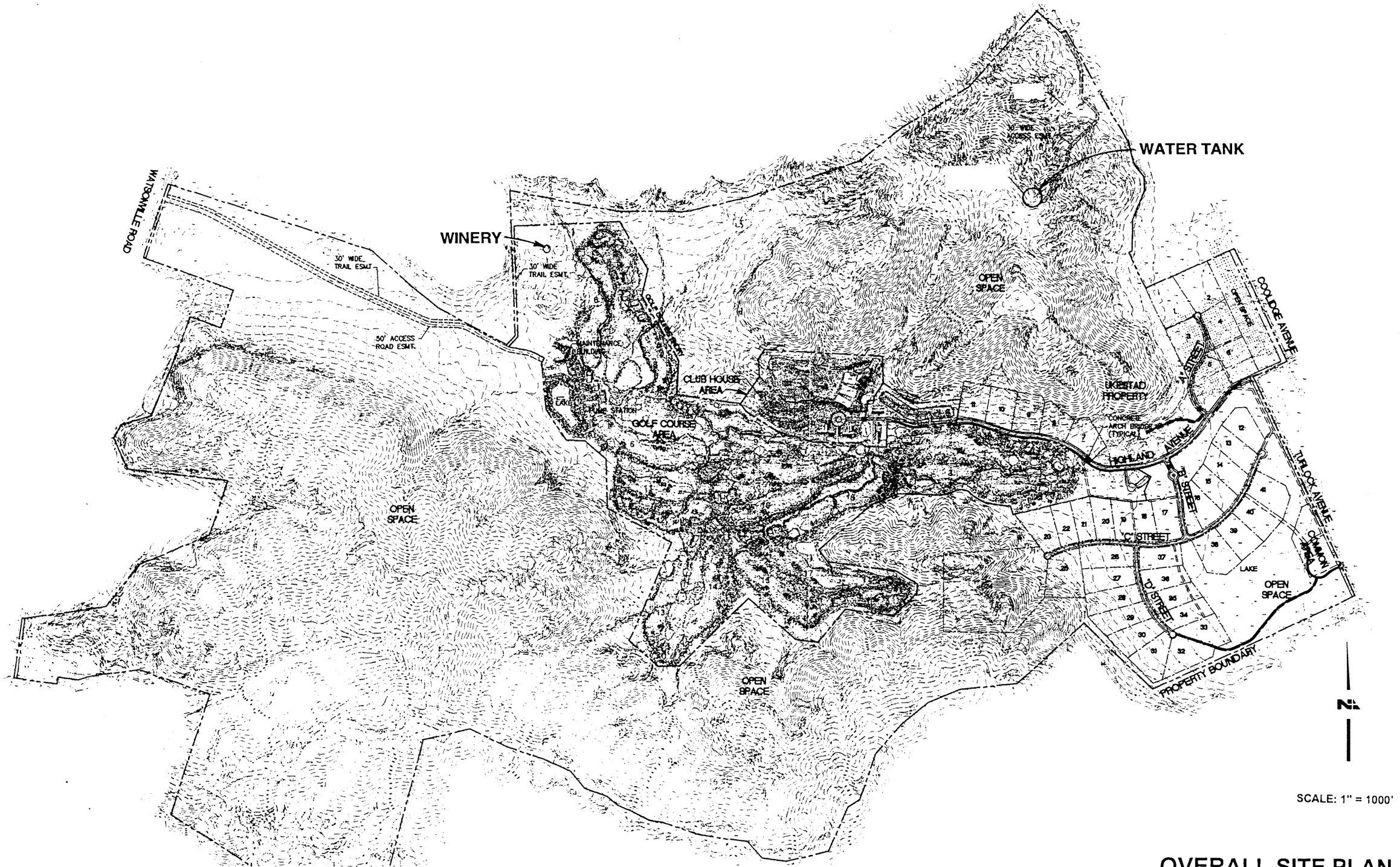
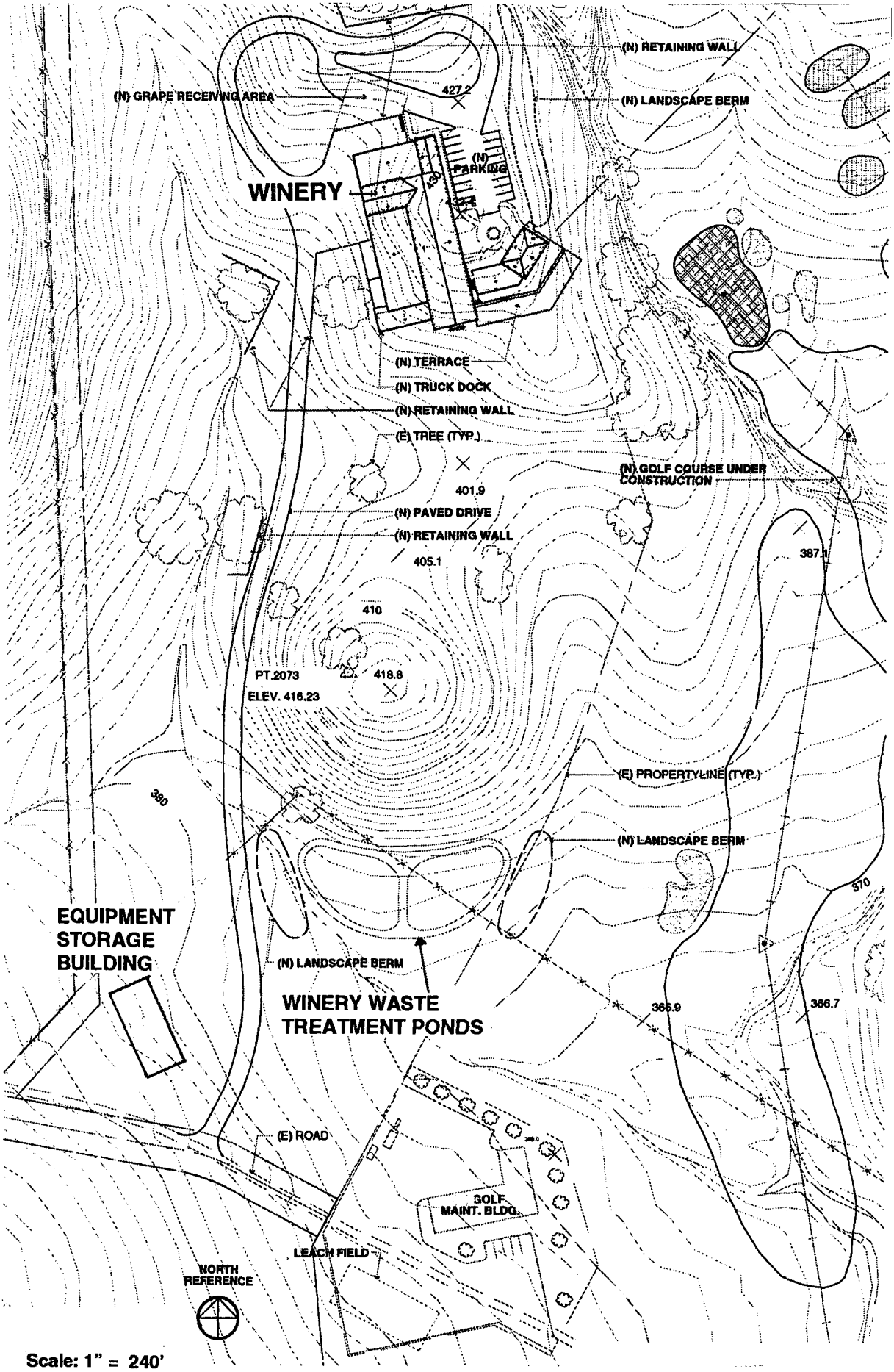


OVERALL SITE PLAN

Source: PACE Engineering

FIGURE 9a

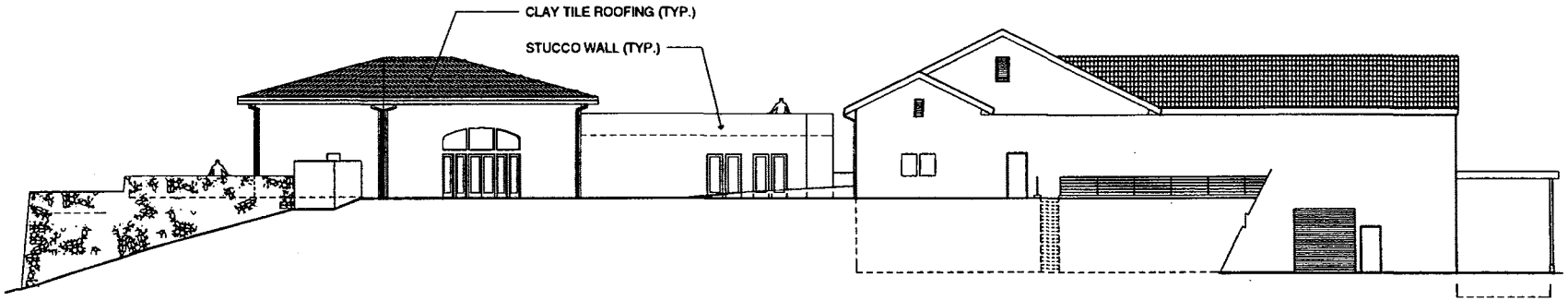


Scale: 1" = 240'

WINERY SITE PLAN

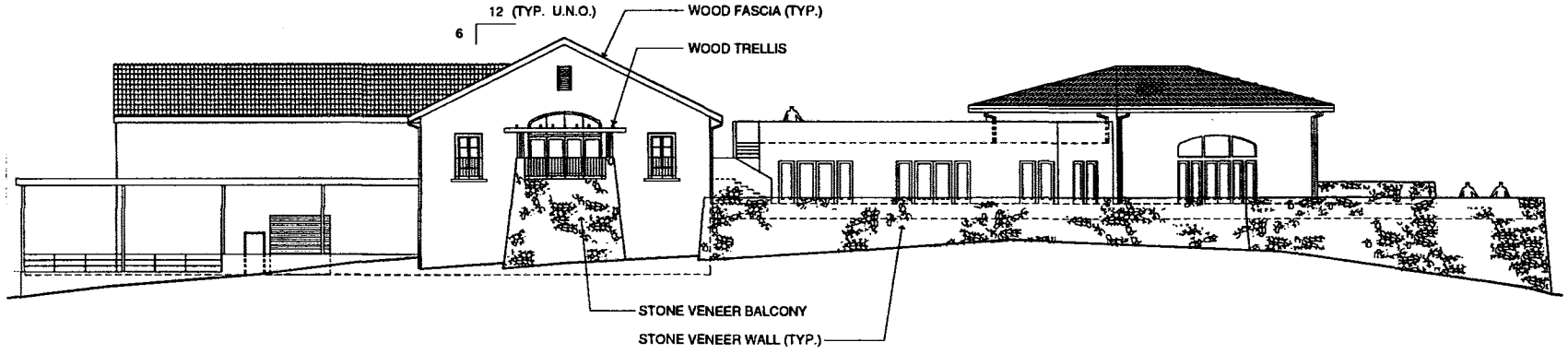
Source: Hall & Bartley Architects

FIGURE 10e



NORTH ELEVATION

1" = 30'-0"



SOUTH ELEVATION

1" = 30'-0"

WINERY ELEVATIONS

Source: Hall & Bartley Architects

FIGURE 10f

Associated Improvements and Programs

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Water Storage Tank

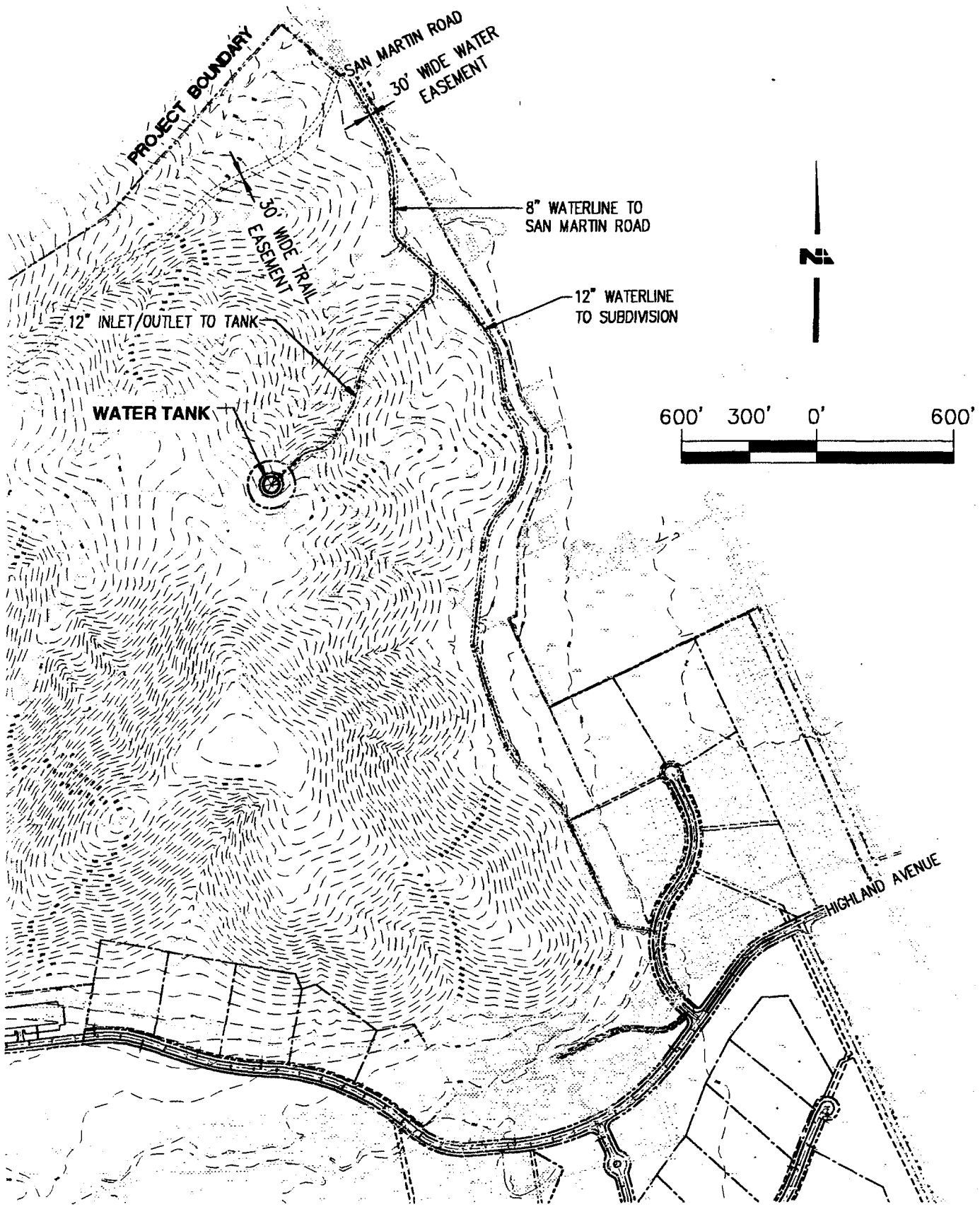
A new 400,000-gallon domestic water tank for the West San Martin Water Works is planned for the upper elevations in the northeast portion of the site (see Figures 9a, 10g and 10h). This tank is needed to provide adequate water pressure and fire flows to the Lion's Gate project, and would also improve fire flows for existing residences east of the project site.

The maintenance access road to the tank would commence from the western extension of San Martin Avenue and would follow an existing dirt track up the hillside to the tank site. The new water main from the tank would be installed in the tank access road to the toe of the eastern hillside where it would split into two mains heading north and south. The southern main would follow the base of the hill to the residential portion of the CordeValle project located north of Highland Avenue. The northern main would follow the maintenance access road to San Martin Avenue where it would tie into an existing water line.

The water tank site is located on an broad eastward sloping swale just below the ridgeline. The tank would be 70 feet in diameter and 34 feet high, with approximately one-half of the overall tank height located below adjacent native ground level. The tank walls would be reinforced concrete supported on a spread foundation, and the tank would have an aluminum domed roof which would be rigidly connected to the tank walls.

Cuts of up to 23 feet would be required to achieve a level pad for the tank. The tank foundation would bear entirely on cut. A french drain would be installed outside the perimeter of the tank to control subsurface drainage.

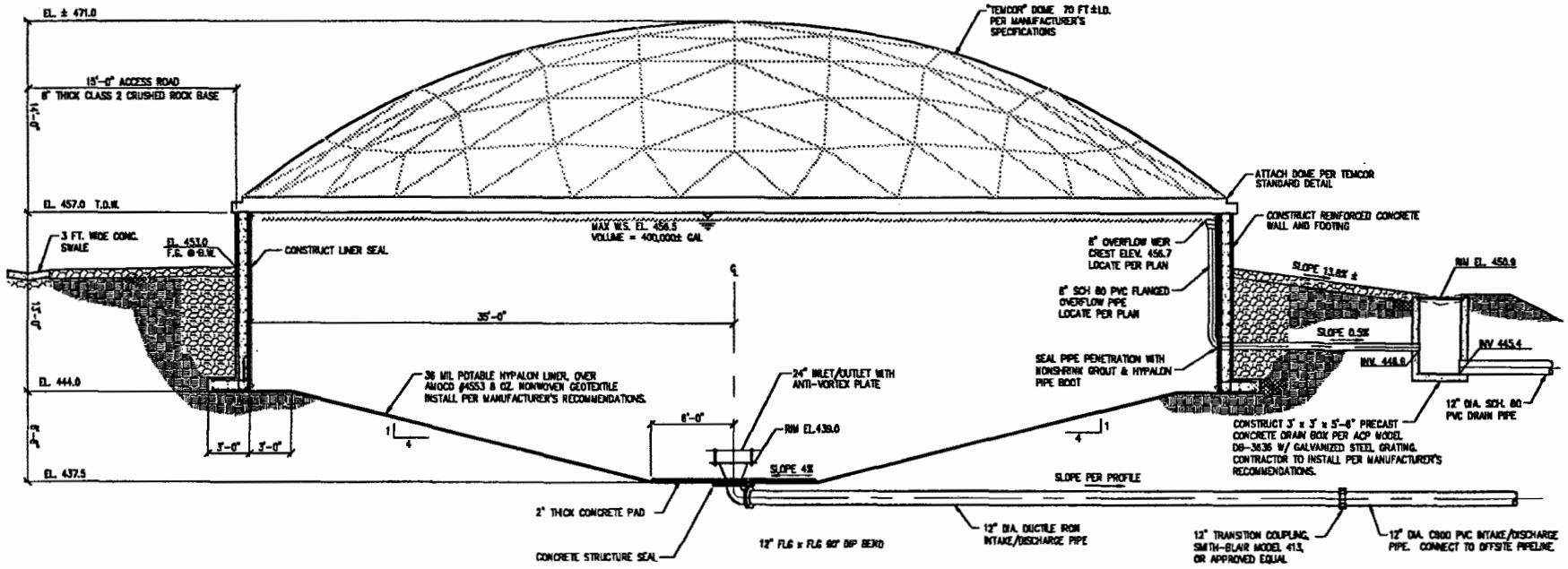
The tank site takes advantage of existing trees to provide visual screening from the valley floor to the east. Additional trees would be planted as needed to increase visual screening. No trees would be removed for the tank, access road, or water main.



WATER TANK AND PIPELINE

Source: PACE Engineering

FIGURE 10g



WATER TANK CROSS SECTION

Source: PACE Engineering

FIGURE 10h

III. ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

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B. AGRICULTURE

Impacts and Mitigation

Mitigation 1. **The loss of approximately 110 acres of prime farmland would be offset by the planting of vineyards in areas not proposed for development.**

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The grapes produced in the on-site vineyards would be processed at the winery planned for the northwest portion of the site. The capability to process the grapes on-site would eliminate the estimated 200 truckloads (by 18-wheel trucks) that would otherwise need to be transported to off-site processing facilities.

D. GEOLOGY AND SOILS

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Impacts and Mitigation

Impact 7. **Expansive soils present on the site may cause movement or heaving, potentially resulting in damage to foundations, concrete pads and pavements. (Potential Significant Impact)**

The majority of the near-surface soil on the site consists of silty or sandy clay, which is moderately to highly expansive. The higher clay content gives the soil the capacity to absorb and release large amounts of moisture with associated volume changes. During the rainy season these soils swell as water is absorbed, and during the dry season they shrink as water is removed by evapotranspiration. Highly expansive soils are evident during the dry season by the formation of open shrinkage cracks on the ground surface.

The expansion (or swell) of soils could exert pressures against foundation elements, and on slopes that could result in creep of the soils. The shrinking of soils could result in consolidation beneath the foundation elements. Structures built on foundations that are not designed for such soil movements can be deformed and damaged.

The north-central area of the site contains colluvial materials which are potentially highly expansive. Any development proposed for this area, such as the maintenance facility, the water storage tank, and the winery/grape processing center, would require special attention during design and construction of building foundations and pavements, but would probably not require site plan modifications.

Mitigation 7. **The potential damage to foundations and pavements would be avoided by following the requirements of the Uniform Building Code, and may necessitate removal of the expansive soils from areas where buildings, slabs-on-grade or pavements are planned to be constructed.**

Site-specific geotechnical studies would be conducted prior to permit approvals to determine if expansive soils are present within the proposed development areas. To mitigate potential foundation problems associated with expansivity of soils, the project geotechnical engineer may recommend that all foundations bear on low expansivity subsoils or bedrock, necessitating the removal of any expansive soils from those areas.. This would result in reduced foundation requirements and lower foundation costs. If removal of expansive soils is not possible, the foundations should be designed to accommodate movements caused by the expansive soils.

At the water tank site, the tank pad would be cut to a depth of about 23 feet, which would remove the majority of the expansive surface soils. Any remaining expansive soils would be removed and replaced with engineered fill as appropriate.

Any locations where ~~the~~ internal access roads traverses expansive soils would require stripping of the expansive soil in the foundation subgrade.

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Impact 10. **Shallow groundwater conditions in areas of the site may adversely affect below-ground structures and utilities. (Potential Significant Impact)**

The relatively shallow groundwater conditions are expected to affect below-ground structures including basements and utilities located at depths of greater than 10 feet below original ground surface in spring areas and in the valley floor. Excavation for stormwater retention basins or ponds, requiring cuts greater than a depth of 10 feet, may encounter groundwater.

Since the water storage tank site is near the top of a broad swale, it is expected that some shallow groundwater may occur near the tank pad elevation. However, the amount of groundwater is anticipated to be relatively small and the potential pore pressure would not be great.

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Mitigation 10. **Groundwater problems would be minimized by avoiding subsurface construction during or just after the rainy season, and through implementation of grading and drainage measures to improve surface and subsurface drainage.**

The grading and drainage plan would include provisions for improving surface and subsurface drainage to alleviate the seasonal groundwater problem.

At the water storage tank site, shallow groundwater conditions would be adequately addressed by installing a french drain on the outside of the tank wall foundation.

J. VISUAL AND AESTHETICS

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Impacts and Mitigation

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Impact 1. **The project would result in visual changes to some areas of the site open to public view. (Potential Significant Impact)**

As discussed under 'Environmental Setting' above, the most visually accessible areas of the site are located along Coolidge Avenue (Santa Teresa Boulevard) and Turlock Avenue at the eastern end of the site, and along Watsonville Road to the west. The interior valley area of the site is not visible from off-site vantage points except for the single home that overlooks the site from the northern ridge. The hillside areas nearest to the flanking roadways are also visible.

The residential subdivisions proposed for the eastern end of the site would be partially visible from adjacent land uses and roadways. In the Rural Residential subdivision proposed adjacent to Coolidge Avenue, north of Highland, the 6 proposed lots would be set back from the roadway at least 300 feet toward the adjacent hillside to the west. The setback area would remain as permanent open space, with a landscaped berm providing visual screening for these lots. A stormwater detention basin would occupy the open space area between the roadside berm and the residential lots; however, the basin would be entirely screened from the roadway by the intervening landscaped berm.

The residential cluster subdivision proposed for the field west of Turlock Avenue would also be partially visible to passing motorists. However, this subdivision would be set back 200 feet to 1,400 feet from the roadway, and would be screened by the landscaped berms planted with black walnut trees. Nevertheless, the roof lines of the nearest dwellings would be visible from Turlock Avenue and Santa Teresa Boulevard, at least until the black walnuts have matured enough to provide more complete screening (see Figure 16). Since two of the proposed lots (Lots 24 and 25) extend into the adjacent hillside area, it is possible that future custom homes to be built on these lots may be visible from Turlock Avenue and Santa Teresa Boulevard.

The water storage tank planned for the northeastern hillside area of the site may be partially visible in the distance from the valley floor to the east and from two or three residences in the Hayes Valley Ranch project to the north and west. The visibility of the tank would be minimized by its location in a broad swale just below the ridgeline. Approximately one-half of the tank would be buried so only the upper portion would extend above ground elevation. The tank site also takes advantage of existing trees downslope to the east for visual screening, and additional trees would be planted as needed to increase visual screening.

The small horse stable planned for the northwest corner of the site would be sited in a small side valley along the toe of the eastern hillsides. The nearest existing land uses include a nursery business located approximately 500 feet east and two single-family dwellings located approximately 800 feet to the northeast and the southeast. The existing nursery

with its dense boundary landscaping almost completely screens the stable from view of Coolidge Avenue and the residences in the vicinity.

The package wastewater treatment plant and residential lake occupy the area between the roadside berm and the residential subdivision. However, these project components would be low in profile and almost completely shielded from view by the landscaped berm along Turlock Avenue.

The only other visual changes that would occur at the eastern end of the site would be the roadway improvements and entry features along the Highland Avenue entry way. However, any improvements would be subject to Architecture and Site Approval to ensure that signs, fences, lighting and other features would be compatible with their surroundings. Also, the existing mature landscaping trees around the ranch complex would be retained and incorporated into the project.

From Watsonville Road to the west, very little of the project, if anything, would be visible. All of the area with ¾ mile of the roadway is proposed to be maintained as permanent open space. The golf course would be located to the east of the low saddle that crosses the western portion of the valley, and thus would not be visible from Watsonville Road. It is possible that the maintenance facility proposed for the western end of the golf course may be partially visible from Watsonville Road, ¾ mile to the west. The only evidence of the project alongside Watsonville Road would be the new maintenance access road to be constructed from Watsonville Road to the golf course maintenance facility. There would be no structural entry features such as signage here since no public access to the golf course would be permitted from this direction.

In the interior area of the valley, the golf course, clubhouse and overnight units would not be visible from off-site vantage points, even from the single dwelling that overlooks the valley from the adjacent ridge to the north. From the vantage point of this residence, the clubhouse/overnight complex would be completely blocked by the intervening low hills and ridges just north of the complex. <u>However, the winery complex would be visible from the residence, although it would be at least 2,000 feet away.</u>

Mitigation 1. **The project would be designed and landscaped in a manner to help it blend in with the natural and rural surroundings, and to reduce its visibility from off-site locations.**

The site planning measures proposed as part of the project, including buffer zones from all adjacent roadways, as well as the proposed landscaping and berming, would minimize the potential visual effects of the project. The design of the residential areas reflects many of the guidelines of the San Martin Integrated Design Plan (see Section *II. Consistency with Plans, Policies and Regulations.)*

All structural elements such as signs, fences, lighting or other entry features would be subject to Architectural and Site Approval to ensure their compatibility with the surroundings. In addition, any structures proposed within 100 feet of adjacent scenic roads would be subject to the County's Design Guidelines.

K. TRAFFIC AND CIRCULATION

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Impacts and Mitigation

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Impact 1. **The project would result in increased traffic generation at the project site. (Potential Significant Impact)**

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The winery would generate a small volume of traffic which would primarily consist of daily trips by 8 permanent employees and 6 additional temporary employees during the harvest and crush season. There would also be a small number of trips (an average of 5 per week) generated by guests, who would visit the winery by appointment only. Truck trips generated would include approximately 40 truck loads of finished product, which would occur periodically throughout the year, and occasional trips by delivery and service vehicles. Since all vehicles would access the winery site from Watsonville Road, they would not contribute to traffic on roadways east of the CordeValle site. The small increment of traffic from the winery would not significantly affect traffic operations on Watsonville Road.

L. NOISE

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Impacts and Mitigation

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Impact 5. **Noise levels would be temporarily elevated during grading and construction. (Potential Significant Impact)**

Most of the existing noise receptors in the area are far from the main grading and construction area of the golf course. The major exception is the existing ranch house at the east end of the site. During construction, maximum noise levels generated by grading, paving, and other activities would be 5 to 10 decibels lower. If average levels do not exceed 55 dBA, there would be no interference with outdoor activity or indoor activity, although the construction may be occasionally audible. Noise levels at the existing ranch could reach as high as 80 dBA with average levels of up to 75 dBA. During most of construction, however, noise levels would be significantly below 55 dBA.

The existing residence on the ridge to the north of the project site would be approximately 1,200 feet from the nearest grading activity for the golf course. At this distance, the sound of equipment would be noticeable but would not exceed 55 dBA.

At the northeastern corner of the site, existing dwellings along and near the western extension of San Martin Avenue (west of Coolidge Avenue) would be subject to short-term noise from the grading and construction of the water tank access road commencing southwestward from the end of San Martin Avenue. These residences would also be subject to temporary noise from truck traffic generated during the construction of the water tank.

At the eastern end of the project site, existing dwellings in the vicinity would be subject to short-term grading and construction noise impacts from construction of the perimeter berms, the detention basin along Coolidge Avenue, the package wastewater treatment plant and lake/detention basin along Turlock Avenue, and to a lesser extent the proposed residential subdivisions which would be set back from the site boundary.

At the western end of the site, the construction of the maintenance access road to Watsonville Road would generate noise from grading and paving. The nearest existing dwelling would be 700 feet from this maintenance road at its nearest point, and would not be subject to construction noise impacts, although the noise would be audible.

Mitigation 5. **Short-term construction noise impacts would be reduced through compliance with the County's Noise Ordinance with respect to hours of operation and maximum noise levels at adjacent property lines. At the eastern edge of the project, the berms proposed along the project boundary would be constructed during the early phases of grading to provide a noise barrier for existing residences nearby.**

The Noise Ordinance stipulates that construction noise generated between 7 am and 7 pm on weekdays and Saturdays should reach noise levels no greater than 75 dBA at an adjoining property line of a single-family or two-family dwelling.

These hours would be enforced by the grading inspector, and also the County Department of Environmental Health in the event of a violation of the County Noise Ordinance.

To minimize noise generation, construction equipment should be maintained in good operating condition and properly muffled.

To further reduce construction noise impacts, the berms proposed for the eastern project boundaries would be constructed during the early phases of grading in order to provide shielding from construction and grading in the interior of the project. This would be particularly effective in attenuating noise from grading and excavation for the detention basin along Coolidge Avenue, and the package wastewater treatment plant and lake/detention basin along Turlock Avenue.

P. WATER SUPPLY

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Impacts and Mitigations

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Impact 1. **The proposed project would increase the demand for water at the site. (Potential Significant Impact)**

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Maintenance Facility: It is estimated that the maintenance facility would use 225 gpd for domestic use, based on 15 employees at 15 gpd per employee. The washdown estimates are provided below.

Winery/Grape Processing Center: Maximum domestic water used at the winery would be based on the maximum number of employees (14) at 15 gpd per employee, for a daily consumption of 210 gpd. In addition, an average of approximately 2,000 gpd of non-potable water would be used for washing down the vats and equipment.

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Mitigation 1a. **Increased water supplies to meet project demand for domestic water would be provided by the West San Martin Water Works, without adversely affecting existing or future users.**

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The project includes a 400,000-gallon water tank to be constructed in the northeast portion of the project approximately 4,000 feet northwest of the Coolidge Avenue/Highland Avenue intersection. ~~In the near future, the water company plans to construct a new 300,000 gallon water tank at an existing tank site on Hayes Lane, approximately ¾ mile north of the proposed clubhouse.~~ This tank is being constructed to improve existing low pressure problems in the system, to enhance fire protection capability, and to provide for projected future growth in the San Martin area. With the completion of this tank, the water company would have sufficient capacity to meet the estimated water demands and fire flow requirements for the Lion's Gate project.

Q. WASTEWATER TREATMENT AND DISPOSAL

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Impacts and Mitigations

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Mitigation 1. **Increased wastewater from the project would be treated and disposed of with new facilities to be constructed in conjunction with the project.**

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Maintenance Facility

The maintenance facility would not be connected to the centralized wastewater system, but would have its own septic tank and leachfield system. Based on a generation rate of 15 gpd for 15 employees, maximum flows would be 225 gpd. Preliminary soils and groundwater studies indicate that there is adequate depth to groundwater, and that the soils in the vicinity have acceptable percolation rates for the planned leachfield.

Winery/Grape Processing Center

The winery is also planned to have its own septic tank and leachfield system. Based on a generation rate of 15 gpd for a maximum of 14 employees during the harvest and crush, maximum flows would be 210 gpd. Wet weather percolation tests have not yet been conducted to determine the suitability of the soils at the winery site for leachfields (these tests are planned to be conducted in the winter of 1999). In the event the soils are found unsuitable, the alternative plan is to pipe the domestic effluent to the nearby golf course maintenance facility septic system for treatment and disposal. The siting and design of the septic tank and leachfield system for the winery would be subject to the criteria and standards of the Santa Clara County Department of Environmental Health.

Washdown water from cleaning the vats and equipment would be piped to two small treatment ponds occupying a 0.5-acre area south of the winery building. This washdown water would be screened for organic material before being piped to the ponds. The washwater would include some residue from cleaning detergents and minor amounts of chemicals used in the wine making process. The treatment ponds would include aerators to prevent stagnation and odor generation, which would also prevent mosquito breeding. Some of the treated washwater would evaporate from the pond, and the remainder would be used for irrigation or frost protection in the vineyards. The organic material screened from the washwater would be applied to the vineyards or used in making mulch for soil amendment. The design and installation of the wastewater treatment ponds would be subject to the approval of the Central Coast Regional Water Quality Control Board.

APPENDICES

APPENDIX C

Geotechnical Reports

Prepared by

Twining Laboratories

August and October 1998

THE TWINING LABORATORIES, INC.
EST 1898
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October 7, 1998

Lion's Gate Limited Partnership
395 Oyster Point Boulevard, Suite 309
South San Francisco, California 94080

Attention: Mr. Ron Davis

Subject: Preliminary Evaluations for
Geotechnical and Geological Feasibility:
Proposed Potable Water Storage Tank
and Proposed Winery Buildings
Cordevalle Estates
San Martin, California

Dear Mr. Ron Davis:

This letter report addresses the geotechnical feasibility of the proposed water storage tank and the winery buildings to be located at the Cordevalle Estates. The proposed water tank is to be located on an eastward sloping swale, about 4,000 feet northwest of the intersection of Highland and Turlock Avenues, and about one-half mile north of the golf course. The winery is to be located northwest of the northwest portion of the golf course on gently rolling terrain.

The Twining Laboratories (Twining) prepared a Geotechnical Engineering Investigation report for the proposed water storage tank, which included test trenching, soil sampling, and laboratory testing of soils. Two test borings have been completed at the site of the proposed winery buildings, however, a complete geotechnical engineering investigation has not been performed. We understand that additional test borings, soil sampling and associated laboratory testing are proposed for the winery to support a design level geotechnical engineering report for that site.

PURPOSE AND SCOPE

This letter report is provided to facilitate evaluation by Santa Clara County with respect to the geotechnical and geological feasibility of the two sites. The report provides our preliminary evaluation of the geotechnical and geological feasibility of the sites.

The following tasks were performed in support of our evaluation:

I. The following previous geologic investigation reports, prepared by others, were reviewed:

Supplemental Geological Reconnaissance Investigation for Proposed Hayes Valley Dams, Santa Clara County, California, prepared by Kaldveer Associates Geoscience Consultants, August 4, 1989.

Geologic Input to Draft Environmental Impacted Report, Lions Gate Development, project HRC-101B, prepared by Wahler Associates for HR Development Partners, April 17, 1990.

Geologic Input to EIR, prepared by ENGEO Incorporated, April 13, 1993.

Geologic Feasibility Investigation, Golf Course Maintenance Building, The Lion's Gate Reserve, San Martin , California, Project 1385/6G, prepared for Hayes Valley Development Partners, by Pacific Geotechnical Engineering, December 1995.

Geologic Feasibility Investigation, Clubhouse and Overnight Lodges, The Lion's Gate Reserve, San Martin, California, Project 1385/5G, prepared for Hayes Valley Development Partners, by Pacific Geotechnical Engineering, December 1995.

Administrative Draft Environmental Impact Report, Volume IIa Technical Appendices, Lion's Gate Reserve, December 1995.

Draft Environmental Impact Report, Volume II Technical Appendices B through E, Lion's Gate Reserve, March 1996.

II. The following geologic and geotechnical reports prepared by The Twining Laboratories were reviewed:

Report entitled Preliminary Geotechnical Engineering Investigation, Golf Coarse, dated March 18, 1997, and Addendums No. 1 and No. 2.

Letter report entitled "Review of Site Geologic Conditions and Grading Plans, Golf Course Phase", dated May 6, 1997.

Report entitled Preliminary Geotechnical Engineering Investigation, Clubhouse and Overnight Lodges, dated October 30, 1997.

Preliminary Evaluation of Geotechnical and Geological Feasibility: Clubhouse and Overnight Lodges Area, dated April 16, 1998.

Geotechnical Engineering Investigation, Maintenance Building, Cordevalle Golf Club and Hotel, San Martin, California, dated July 8, 1998.

Geotechnical Engineering Investigation, Proposed Potable Water Tank, dated August 11, 1998.

Geotechnical Engineering Investigation, Proposed Cart Path, Pedestrian, and Utility Bridges, Cordevalle Estates, San Martin, California, dated September 25, 1998.

This report is provided specifically for the water storage tank and winery buildings at the proposed Cordevalle Estates, referenced in the Proposed Construction section of this report.

This investigation did not include design level geotechnical engineering investigation, floodplain investigation, agricultural compatibility assessment, compaction tests, environmental investigation, or environmental audit. This investigation was intended only to evaluate the static physical characteristics of the soils and rock at the project sites.

BACKGROUND

Site Descriptions

Water Storage Tank Site: The potable water tank site is located on an eastward sloping swale, about 4,000 feet northwest of the intersection of Highland and Turlock Avenues, and about one-half mile north of the golf course. The swale slopes at about 4 horizontal (H) to 1 vertical (V). The west edge of the proposed tank is approximately 125 feet downslope from the top of a broad ridgeline. Oak trees are present on the hillside near the near the proposed tank site. Dry brown grasses of up to 3 feet high covered the surface soils at the time of our field investigation.

According to a geologic map of the site region prepared by Kaldveer Associates (scale: 1 inch = 500 feet, 1989) for the proposed Hayes Valley Dam, the tank is located on Franciscan Complex greenstone. A serpentinite belt is located approximately 500 feet west of the proposed tank site. The nearest mapped active or potentially active fault is the Sargent-Berrocal Fault, located about 2.5 miles east of the site.

Winery Buildings Site: The winery site is located west of the northwestern most portion of the golf course, approximately 300 feet west of the number 6 green. The winery buildings are to be located near the axis of a gently sloping, north-south trending, ridge line. Slope gradients at this location range from nearly flat at the top of the ridge to a maximum slope of about 5 horizontal to 1 vertical. Dry native grasses and scattered oak trees were observed during our site reconnaissance. A pre-engineered building to be used for vineyard agricultural purposes will be located about 400 feet southwest of the winery buildings.

Anticipated Construction

Water Storage Tank: We understand the proposed potable water tank will include a 70-foot diameter reinforced concrete walled tank with an approximate capacity of 420,000 gallons. Approximately two-thirds of the tank height will be below the adjacent native grade level. The tank is proposed to have an aluminum "TEMCOR" domed roof and a 36 mil Hypalon liner covering the sides and bottom of the tank. An 8 ounce nonwoven geotextile is proposed to be placed below the bottom portion of the tank liner. The bottom surface of the tank will be sloped toward the center at a 4H to 1V gradient. The reinforced concrete walls will be supported on a 3-foot wide perimeter spread foundation. A french drain will be installed outside the entire perimeter of the reinforced concrete tank wall. A perimeter access road with a Class II aggregate base surface will be constructed around the tank.

Cuts of up to about 23 feet are proposed to achieve a level pad for the tank. The tank foundation is proposed to bear entirely on cut. Fills of about 2 to 5 feet are proposed along the downslope perimeter on the pad, beneath the perimeter access road.

Winery Buildings: We understand that the winery will comprise an approximate 20,000 square foot, wood-frame, main winery building, and a pre-engineered building to be used for vineyard agricultural purposes. Anticipated grading would include cuts and fills of up to about 5 to 8 feet.

General Geologic Conditions

The earth materials underlying the proposed water storage tank and winery sites are composed of rocks belonging to the Franciscan Complex of Jurassic to Cretaceous age. Bedrock types found within the Hayes Valley area include sandstone, shale, chert, limestone, greenstone, and low grade metamorphic rocks. Many areas of bedrock terrain include a mixture of different rock types in a sheared matrix. This formational mixture is termed a melange and was formed as a result of intense shearing and faulting. Serpentine is also found within this assemblage of rocks.

The regional trend of geologic structures in the Hayes Valley area is roughly east-west, acute to the overall geologic structure of North 40 degrees East for the Santa Cruz Mountains as a whole. Physiographic features, bedrock contacts, and faults are generally parallel to this structural trend.

The proposed water storage tank and winery buildings are located approximately 7 to 8 miles northeast of the San Andreas Fault and 6 miles southwest of the Calaveras Fault. Other active faults in the site region include the Hayward and Sargent-Berrocal faults. Regional geologic maps prepared by U.S. Geological Survey and the California Division of Mines and Geology show a bedrock fault and bedrock contacts within the melange terrain on the north side of Hayes Valley. The faults and contacts are also shown on the Geologic Index Map (Figure 1), of the Geologic Feasibility Investigation for the Clubhouse and Overnight Lodges, prepared by Pacific Geotechnical Engineering, dated December 1995.

Soil Conditions in the Site Areas

Soil conditions in the areas of the proposed water tank and winery building were revealed in test borings conducted by Twining during July and August, 1998, respectively.

Water Storage Tank Site: Near surface soils comprise silty sands at the water storage tank site. The sands extend from the ground surface to depths of approximately 1 to 2 feet below site grade (BSG). The root systems of grasses and weeds extended to depths of about 18 to 24 inches. Sandy and gravelly lean clays were present beneath the silty sands. Weathered greenstone bedrock was encountered in test pits and a test boring at depths of 5 to 7 feet BSG, extending to the maximum depths explored (41.5 feet BSG).

Winery Buildings Site: Silty sands with gravel are present at the proposed winery buildings site to depths of about 0.5 to 2.5 feet BSG. Highly weathered greenstone bedrock was encountered below the silty sand in both soil borings drilled, to the maximum depths of exploration of 6.5 and 10.5 feet BSG.

Review of Previous Geologic Investigation Reports

We have reviewed the geologic reports listed under "Purpose and Scope". Most of the cited reports present descriptions of regional geologic and tectonic conditions, and general site geologic conditions. Our summary of these regional conditions are presented above under the "Background" section of this report. Geologic conditions applicable to the subject sites, which are described in these reports, and conditions noted during our geologic field reconnaissance of the site areas are summarized in the "Evaluation" section of this report.

Geologic Field Reconnaissance

A geologic field reconnaissance of the proposed water storage tank and winery buildings areas was performed in conjunction with our review of the proposed golf course and surrounding areas performed on April 28, 1997. The reconnaissance, which included confirming previously mapped geologic features and noting potential geologic hazards, was performed by Kenneth J. Clark, Certified Engineering Geologist. The results of the geologic field reconnaissance suggest that the geologic map prepared by ENGEO is generally suitable for planning purposes for the proposed water storage tank and winery buildings project. This map is included as Figure No. 2 of the report entitled "Geologic Input for EIR For Lion's Gate Property", dated April 13, 1993 (contained in the Draft Environmental Report [DEIR]). However, we do not warrant the accuracy of the aforementioned map. Additional reconnaissance of the water storage tank and winery buildings sites was performed by Mr. Kenneth Clark on July 7, 1998, and May 5, 1998, respectively.

EVALUATION

This section presents our evaluation of potential geotechnical and geologic concerns pertinent to the water storage tank and winery buildings area, and a discussion of potential measures to mitigate the adverse conditions.

Soil and Rock Conditions

Water Storage Tank Site: The predominant soil types at the water storage tank site are silty sands and sandy and gravelly lean clays. The soils overlie weathered greenstone bedrock at depths of 5 to 7 feet BSG. The sandy soils, to depths of 1 to 2 feet BSG were generally loose. The clayey soils are anticipated to have a medium expansion potential, moderate compressibility, and the potential for moderate to high swell. However, we anticipate that the pad will be cut to a maximum depth of about 23 feet to achieve the designed tank bottom surface. This excavation would remove the majority of the loose near-surface silty sands and clayey soils. Along the perimeter of the pad (where fill is to be placed) care should be taken to remove the loose silty sand soils to a minimum depth of 1 foot BSG prior to placement of the fill. Field and laboratory data suggest that weathered greenstone rock will provide an adequate foundation material to support the water storage tank.

Based on our observations of the weathered rock in test pits, temporary cut slopes into the rock material will likely be stable up to gradients of about 3/4H to 1V. Temporary cut slopes in lean clay or silty sand soils will likely be stable to about 1H to 1V. If sloughing of the cut slope occurs, the temporary excavations should be shored or slopes flattened.

Winery Buildings Site: Soil borings indicate the winery buildings site includes silty sand with gravel underlain by highly weathered greenstone bedrock at a depth of about 0.5 to 2.5 feet BSG. The silty sands are generally loose. The loose silty sand soils will not adequately support fills, foundations, or floor slabs. These soils should be removed prior to placement of engineered fill, floor slabs, or shallow footings. Slabs and foundations should bear either entirely on engineered fill or entirely on firm native weathered bedrock.

Although not noted in the soil borings, lean clay soils (prevalent at the Cordevalle Estates project site) may be encountered during further investigation and/or grading for the winery buildings. Over time near surface clays will experience cyclic drying and wetting as the dry and wet seasons pass. Clays soils are anticipated to experience volumetric changes (shrink/swell) as the moisture content of the clay soils fluctuate. These shrink/swell cycles can impact foundations and lightly loaded slabs-on-grade even though the expansion potential is classified as medium. Expansive soils cause more damage to structures, particularly light buildings and pavements, than any other natural hazard, including earthquakes and floods (Jones and Holtz, 1973). Expansion potential may not manifest itself until months or years after construction. At most sites there exists a depth to which the moisture content of the subgrade remains essentially constant throughout the year; thus, the clays would not undergo a significant volume change below this depth. Therefore, the depth, referred to as the "critical depth", to which significant moisture fluctuation occurs influences the selection of suitable foundation and floor slab alternatives for this site. Climatic conditions, groundwater conditions, landscape irrigation, and the soil conditions effect the critical depth. Our review of moisture data and observations of near surface clay soils did not clearly demonstrate a critical zone depth. Based on experience, it is expected that the critical zone would be approximately 24 inches BSG in the site region, and that seasonal moisture fluctuation would effect soils to a depth of 2 feet BSG. The above estimate of the critical depth should be reevaluated based on soil sample test data to be generated for the proposed geotechnical and geological investigation.

Potentially expansive clayey soils may be present near the proposed locations of floor slabs or lightly loaded foundations at the winery buildings site. If clay soils are present, footings should be extended to bear at the bottom of the critical zone, at least 24 inches BSG. Over-excavation and backfilling with non-expansive engineered fill soils my be required below floor slabs. Based on soils data generated for other sites within the Cordevalle project, we anticipate that 12 to 24 inches of nonexpansive granular soil would be required between floor slabs and clayey soils. Recommendations for footings and over-excavation and placement of non-expansive engineered fill should be provided with the report of Geotechnical Engineering Investigation of the winery buildings site

Faulting

The water storage tank and winery buildings sites are located in a seismically active region with numerous active and potentially active faults. The nearest mapped active or potentially active fault is the Sargent-Berrocal Fault, located 2 to 3 miles east of the site. Several bedrock faults associated with melange terrace have been mapped by others on the Cordevalle development site. Our field reconnaissance and review of the aforementioned geologic reports, prepared by others, do not indicate the presence of faults in the immediate areas of the proposed water storage tank and winery buildings. Additionally, our review of data presented in geologic reports previously generated for the development project indicates that the bedrock faults in the site area are inactive.

The subject sites are not located in an area containing any of the State of California Earthquake Fault Zones (formerly Alquist-Priolo Special Studies Zones), established to delineate earthquake fault zones.

Considering the presence of mapped bedrock faults (inactive) in the vicinity of subject sites, it is possible that site grading for the projects may reveal shear zones or faults in the bedrock. It is generally not recommended to build a structure across a fault, active or inactive. Although the mapped faults are judged to be inactive, geologic evaluation should be conducted during grading operations. Exposed bedrock should be observed by an engineering geologist to assess the presence or absence of faults. Structures built across faults may be supported on soil or rock materials with highly variable foundation properties, and excessive differential settlement can result. Potential differential settlement may be reduced by over-excavation and placement of engineered fill over the fault, or modifying the location of the structure away from the fault.

Seismic Ground Motion

Seismic ground motion may occur at the site as a result of earthquakes on nearby active faults. The intensity of ground shaking depends on factors such as earthquake magnitude, distance to causative fault, depth to bedrock, physical characteristics of underlying soil and bedrock, and local topography. Terratech (1988) indicated that ground motions were likely to exceed 0.5 g.

Our deterministic evaluation of the potential magnitude of seismic ground motion indicates that the upper bounds earthquake event would likely produce a peak horizontal ground acceleration at the site in the range of 0.4g to 0.5g.

Native Slope Stability

Landslides on the proposed development site were mapped by others (Kaldveer Associates, 1989, and Wahler Associates, 1990). The locations of these landslides are shown on Figure No. 2 of the report entitled "Geologic Input for the Lion's Gate Property" (DEIR Volume II) which is a compilation of site data generated prior to April 1993. Previously mapped landslides were observed during our geologic field reconnaissance near the two subject sites. These slides appeared to comprise relatively shallow rotational block slides and slumps.

The aforementioned mapping studies do not indicate landslides have occurred in the immediate vicinity of the water storage tank or winery buildings sites. Field reconnaissance performed by Twining did not indicate the occurrence of notable landslides near the subject sites. Native slopes in the areas proposed for the water storage tank and winery buildings appear relatively stable.

Shallow Groundwater

Considering the proposed water storage tank location near the top of a broad swale, we anticipate that some shallow groundwater may occur near the tank pad elevation. However, the amount of groundwater is anticipated to be relatively small and it appears that potential pore pressure and nuisance conditions could be adequately addressed by installing a french drain proposed on the outside of the tank wall foundation. A french drain outside the tank wall foundation is included on the civil engineering plans for the project.

Groundwater was not encountered in exploratory borings drilled (August, 1998) at the winery buildings site. Considering the elevated topographic location of the proposed building sites, we anticipate that shallow groundwater will not have an adverse impact on the winery buildings project.

Subsequent to rough grading of the water tank and winery buildings sites, slope, soil, and rock conditions should be reviewed by Twining's civil engineer or engineering geologist for evidence of subsurface groundwater flow. Conditions favoring seeps include relatively shallow bedrock (or other impermeable layer) with an overlying permeable soil. Soil textures exhibiting a selective removal of fine particles from currently dry soils may indicate subsurface groundwater flow during wetter periods. Erosion may be accelerated and slope stability compromised where groundwater daylights (seeps) on cut slopes.

The following mitigation methods may be employed where shallow groundwater impinges on:

- Road subgrades: Trenched cut-off walls and subdrains
- Native slopes: Upslope trench cut-off wall or horizontal wick drains
- Cut slopes: Retaining wall with filter drain and weep holes

Mitigative measures should be designed by Twining's civil engineer or engineering geologist for specific areas, when adverse shallow groundwater conditions are identified.

Liquefaction and Seismic Settlement

Liquefaction describes a phenomenon in which a saturated, cohesionless soil loses strength during an earthquake as a result of induced shearing strains. Lateral and vertical movement of the soil mass, combined with loss of bearing usually results. Liquefaction can cause damage to structures during earthquake events. Foundations can literally loose support due to bearing capacity failure. The resulting displacements can induce excessive differential settlements in floor slabs and foundations. Research has shown that liquefaction potential of soil deposits induced by earthquake activity depends on soil types, void ratio, groundwater conditions, duration of shaking, and confining pressure over the potentially liquefiable soil mass. Fine, well sorted, loose sand, high groundwater conditions, higher intensity earthquakes, and particularly long duration of groundshaking are the requisite conditions for liquefaction.

Based on the anticipated shallow bedrock and paucity of well sorted loose sandy soils, as suggested by Twining's previous investigations, the water storage tank and winery buildings sites do not appear to be susceptible to liquefaction.

Seismic settlement occurs when loose, poorly graded, granular soils consolidate as a result of cyclic ground shaking associated with an earthquake. Based on the anticipated shallow bedrock and lack of well sorted loose sandy soils, the water storage tank and winery buildings sites do not appear to be susceptible to seismic settlement.

Serpentine Rock

The proposed water storage tank and winery buildings sites are not located near mapped exposures of serpentinite. Accordingly, we do not anticipate that grading operations would reveal asbestos bearing serpentinite materials. However, naturally occurring asbestos materials may be associated with serpentine rock which has been documented by previous investigators at other locations on the development property. Serpentine rock is typically a green or yellow,

highly sheared and altered rock, with a fibrous appearance. In the event site grading exposes asbestos bearing materials, the location of the locations of these materials should be documented and the asbestos content should assessed by Twining.

If asbestos bearing materials are exposed during grading of the sites, or where asbestos-containing fill material is used, the potential for human exposure to asbestos should be mitigated. Exposed cuts with asbestos-containing serpentine should be gunited or covered with 12 inches of asbestos free fill. Asbestos materials used as fill should be covered with 12 inches of serpentine free fill.

CONCLUSIONS

Based on our reconnaissance and geotechnical evaluation of the water storage tank area, our reconnaissance and limited field exploration at the winery buildings site, and our understanding of the anticipated construction at the two sites, we present the following general conclusions.

- The water storage tank and winery buildings sites appear suitable for the proposed construction provided the recommendations contained in this report and design level geotechnical engineering reports are followed. It should be noted that the recommended design consultation and construction monitoring by Twining are integral to this conclusion.

- The predominant soil types at the water storage tank site are silty sands, and sandy and gravelly lean clays overlying weathered greenstone bedrock at depths of 5 to 7 feet BSG.

- Silty sands with gravel are present at the proposed winery building locations to depths of about 0.5 to 2.5 feet BSG. The silty sands are underlain by highly weathered greenstone bedrock to the maximum depths of exploration of 6.5 and 10.5 feet BSG.

- Some shallow groundwater may impact the proposed water storage tank site. Based on our estimate of the quantity and location of this shallow groundwater, the french drain proposed for behind the tank wall foundation would provide adequate subsurface drainage for the tank structure. Shallow groundwater is not anticipated to impact winery buildings. However, subsequent to rough grading of the water tank and winery buildings sites, slope, soil, and rock conditions should be reviewed by Twining's civil engineer or engineering geologist for evidence of subsurface groundwater flow. Adverse shallow groundwater can be controlled using the methods listed in the "Evaluation" section.

- Potentially expansive clayey soils may be present near the proposed locations of floor slabs or lightly loaded foundations at the winery buildings site. If clays are encountered at these locations foundations will need to be extended to the base of the critical zone (approximately 24 inches). Over-excavation and backfilling with non-expansive engineered fill soils my be required. Based on soils data generated for other sites within the Cordevalle project, we anticipate that 12 to 24 inches of nonexpansive granular soil would be required between floor slabs and clayey soils. A recommendation for over-excavation and placement of non-expansive engineered fill should be provided with the report of Geotechnical Engineering Investigation of the winery buildings site.

- Data presented in the cited reports of previous investigations do not indicate the presence of bedrock faults in the vicinity of the subject sites. The reports indicate that evidence suggests these bedrock faults are not active.

- The subject sites do not lie within published special study zones for ground surface rupture. Our literature investigation suggests that the potential for ground rupture at the subject sites associated with a known fault is low.

- A preliminary deterministic seismic evaluation indicates that the "upper bounds" earthquake event would produce peak horizontal ground acceleration at the subject sites in the range of 0.4g to 0.5g.

- Soil and rock conditions revealed at the site are not conducive to liquefaction or seismic settlement, and suggest a low potential for liquefaction and significant seismic settlement.

- We do not anticipate that grading operations would reveal asbestos bearing serpentinite materials. However, if asbestos bearing material is revealed during grading, the potential for human exposure to asbestos can be mitigated. In areas where final grading exposes asbestos-containing serpentine, or where asbestos-containing fill material is used, the potential for human exposure can be mitigated by covering with 12 inches of asbestos free engineered fill.

RECOMMENDATIONS

Based on our investigation of the water storage tank and winery buildings sites, the following recommendations are presented for use in project design. Recommendations for the proposed winery buildings are subject to change based on the results of the proposed geotechnical engineering investigation.

When applying the preliminary recommendations for design, the background information, procedures used, findings, evaluation, and conclusions should be considered. The recommended design consultation and construction monitoring by Twining are integral to the proper application

of recommendations made for the subject site.

Additional Investigations

A geotechnical field investigation, laboratory investigation of soils, and evaluations should be conducted, and recommendations for site preparation, foundations, slabs-on-grade, and pavements should be prepared prior to construction of the proposed winery buildings. A geotechnical engineering investigation report has been prepared for the water storage tank site (Twining, August 11, 1998).

Even after submittal of the geotechnical and geological engineering investigation report, conditions may be encountered during grading, or the scope of the project may change such that additional or altered recommendations may be warranted as an addendum to the geotechnical engineering investigation report. Twining should observe the project sites after rough grading to assess the potential presence of faults, asbestos containing soils, shallow groundwater, loose soils, or expansive clayey soils.

Potential mitigative measures for adverse conditions are described in the "Evaluation" section of this report. Mitigative measures should be designed by Twining's civil engineer or engineering geologist for specific areas, if necessary.

When grading plans have been generated, Twining should be provided the opportunity to review the plans. Conclusions and recommendations presented in this report, as well as the geotechnical engineering investigation reports, should be incorporated into the final design of the water storage tank and winery buildings.

Twining should be contacted to provide an inspection of final grading.

CONSTRUCTION MONITORING

It is recommended that Twining be retained to observe the excavation and earthwork phases of the subject project to determine that the subsurface conditions are compatible with those referenced in this report and identified in the proposed geotechnical and geological engineering investigation report. These services should include site review by an engineering geologist at least monthly.

Twining should conduct the necessary observation, field testing services and provide results so that action necessary to remedy potential deficiencies can be taken in accordance with the plans and specifications. Upon completion of the work, a written summary of observations should be prepared including field testing and conclusions regarding the conformance of the completed work to the intent of the plans and geologic and geotechnical specifications.

Upon the completion of work, a final engineering geology report should be prepared by Twining. This report is essential to ensure that recommendations are incorporated into the project construction, and to note any deviations from the project plans and specifications. The client should notify Twining upon the completion of work to provide this report.

DESIGN CONSULTATION

Twining should be provided the opportunity to review those portions of the contract drawings and specifications that pertain to earthwork and foundations prior to finalization to determine whether they are consistent with our recommendations.

If Twining is not afforded the opportunity for review, we assume no liability for the misinterpretation of our conclusions and recommendations. This review is documented by a formal plan/specification review report provided by Twining.

NOTIFICATION AND LIMITATIONS

The conclusions and recommendations presented in this report are based on the information provided regarding the proposed construction, and the results of the research of background information, combined with interpolation of the subsurface conditions from investigations conducted at nearby sites. A design level geotechnical investigation is necessary for prior to construction of the winery buildings.

The focus of our investigation was the proposed water storage tank and winery buildings sites and pertains only to geologic and geotechnical concerns of this site. Potential geotechnical and geologic hazards to structures on or outside of the subject site were not evaluated in this report.

If variations or undesirable conditions are encountered during construction, Twining should be notified promptly so that these conditions can be reviewed and our recommendations reconsidered where necessary. It should be noted that unexpected conditions frequently require additional expenditures for proper construction of the project.

If the proposed construction is relocated or redesigned, or if there is a substantial lapse of time between the submission of our report and the start of work (over 12 months) at the site, or if conditions have changed due to natural cause or construction operations at or adjacent to the site, the conclusions and preliminary recommendations contained in this report should be considered invalid unless the changes are reviewed and our conclusions and recommendations modified or approved in writing.

Changed site conditions, or relocation of proposed structures, may require additional investigations to determine if our conclusions and recommendations are applicable considering the changed conditions or time lapse.

The conclusions and recommendations contained in this report are valid only for the project discussed in the "Anticipated Construction" section of this report. The entity or entities that use or cause to use this report or any portion thereof for a structure or site other than those indicated in the "Background" section of this report shall hold Twining, its officers and employees harmless from any and all claims and provide Twining's defense in the event of a claim.

This report is issued with the understanding that it is the responsibility of the client to transmit the information and preliminary recommendations of this report to developers, owners, buyers, architects, engineers, designers, contractors, subcontractors, and other parties having interest in the project so that the steps necessary to carry out these preliminary recommendations in the design, construction and maintenance of the project are taken by the appropriate party.

This report presents the results of a preliminary investigation of geotechnical and geological feasibility, and should not be construed as a geotechnical report, or an environmental audit or study.

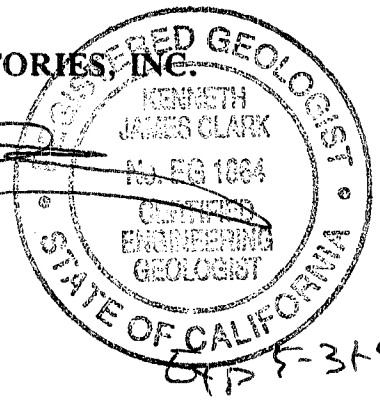
Our professional services were performed, our findings obtained, and our recommendations prepared in accordance with generally-accepted engineering principles and practices in Santa Clara County, California at the time of the investigation. This warranty is in lieu of all other warranties either expressed or implied.

Reliance on this report by a third party (i.e., that is not a party to our written agreement) is at the party's sole risk. If the project and/or site is purchased by another party, the purchaser must obtain written authorization and sign an agreement with Twining in order to rely upon the information provided in this report for design or construction of the project.

CLOSING

We appreciate the opportunity to be of service to Lion's Gate Estate Partners. If you have any questions regarding this report, or if we can be of further assistance, please contact us at your convenience.

Sincerely,
THE TWINING LABORATORIES, INC.



Kenneth J. Clark, CEG
Project Geologist

cc: Mr. Burt Verrips

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KC/pc

REFERENCES

Kaldveer, 1990, Supplemental Geological Reconnaissance Investigation for Proposed Hayes Valley Dams, Santa Clara County, California, prepared by Kaldveer Associates Geoscience Consultants, August 4, 1989.

Terratech, 1988, Prepurchase Site Assessment of Geologic Hazards, Ground Water Supply and Environmental/Toxic Contamination, Hayes Valley Property, Santa Clara , California, Project 4297, prepared for LAND USE, by TERRATECH, INC., January 20 1988.

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Wahler, 1990, Geologic Input to Draft Environmental Impacted Report, Lions Gate Development, project HRC-101B, prepared by Wahler Associates for HR Development Partners, April 17, 1990.

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GEOTECHNICAL ENGINEERING INVESTIGATION
PROPOSED POTABLE WATER TANK
CORDEVALLE GOLF CLUB AND HOTEL
SAN MARTIN, CALIFORNIA

Project Number: D34301.02

Prepared for:

Lions Gate Estate Partners, LLC
405 El Camino Real, Suite 127
Menlo Park, California 94025

August 11, 1998

CORPORATE OFFICE
2527 Fresno Street
Fresno, CA 93721
(209) 268-7021 • Fax 268-7126

MODESTO
4230 Kiernan Ave., #105
Modesto, CA 95256
(209) 545-1050 • Fax 545-1147

VISALIA
130 North Kelsey St., #H6
Visalia, CA 93291
(209) 651-8280 • Fax 651-8288

BAKERSFIELD
3701 Pegasus Drive, #124
Bakersfield, CA 93308
(805) 393-5088 • Fax 393-4643

SALINAS
520 #A Crazy Horse Canyon Rd.
Salinas, CA 93907
(408) 449-5284 • Fax 449-5092

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August 11, 1998 D34301.02-06

Lion's Gate Estate Partners, LLC
405 El Camino Real, Suite 127
Menlo Park, California 94025

Attention: Mr. Tom Hix

Subject: Geotechnical Engineering Investigation
Proposed Potable Water Tank
Cordevalle Golf Club and Hotel
San Martin, California

Dear Mr. Hix:

We are pleased to submit this geotechnical engineering investigation report prepared for the proposed potable water tank at the Cordevalle Golf Club and Hotel located west of the City of San Martin, in Santa Clara County, California. The contents of this report include the purpose of the investigation, scope of services, background information, investigative procedures, our findings, evaluation, conclusions, and recommendations.

We recommend that those portions of the plans and specifications that pertain to earthwork, and foundations be reviewed by The Twining Laboratories, Inc. (Twining) to determine if they are consistent with our recommendations. This service is part of this current contractual agreement and the client should provide these documents for our review prior to their issuance for construction bidding purposes.

In addition, it is recommended that Twining be retained to provide inspection and testing services for the excavation, earthwork, and foundation phases of construction. These services are necessary to determine if the subsurface conditions are consistent with those used in the analysis and formulation of recommendations for this investigation, and if the construction complies with our recommendations. This service is not, however, part of this current contractual agreement.

We would appreciate the opportunity to provide a proposal for this additional service after construction documents are completed. Mr. Harry Moore with our firm (800-268-7021) will contact you in the near future regarding these services.

We appreciate the opportunity to be of service to Lion's Gate Estate Partners, LLC. If you have any questions regarding this report, or if we can be of further assistance, please contact us at your convenience.

Sincerely,
THE TWINING LABORATORIES, INC.

Kenneth J. Clark, CEG
Engineering Geologist

EXECUTIVE SUMMARY

The proposed Cordevalle Golf Club and Hotel will include a 70-foot diameter reinforced concrete potable water tank with an approximate capacity of 420,000 gallons. The tank will have an aluminum "TEMCOR" domed roof and a 36 mil Hypalon liner covering the sides and bottom of the tank. The tank is to be located in a gentle swale with approximately two-thirds of the tank height below the adjacent native grade level. The reinforced concrete walls will be supported on a 3-foot wide perimeter spread foundation. A french drain will be installed outside the entire perimeter of the reinforced concrete tank wall. The tank will have a perimeter access road surfaced with Type II aggregate base.

The Twining Laboratories, Inc. (Twining) was authorized on December 12, 1997, by Mr. Thomas Hix with Lion's Gate Estate Partners, LLC, to conduct this geotechnical engineering investigation.

The purpose of this investigation was to provide geotechnical engineering parameters for earthwork, site preparation, and preliminary information for preparation of related construction documents. The investigation included a field exploration and laboratory testing program, evaluation of the data collected during the field and laboratory portions of the investigation, and preparation of this report.

Reconnaissance of the site consisted of walking the site and noting visible surface and slope features. The reconnaissance was conducted by Mr. Kenneth Clark on July 7, 1998. Maximum native slopes within the swale at the proposed tank location range from about 4 horizontal (H) to 1 vertical (V) to 5H to 1V. Our reconnaissance did not reveal evidence of existing slope failure near the proposed tank location. Native slopes in the area of the proposed tank appear relatively stable.

On July 7, 1998 one (1) test boring was drilled near the proposed tank location to a depth of 41.5 feet below site grade (BSG). In addition, two (2) test pits were excavated below the proposed tank location to depths of 11 and 12 feet BSG. Soil samples were collected from the boring and pits for testing.

Soil conditions encountered during the field investigation were relatively consistent across the project site. The near surface soils were silty sands to depths of about 1 to 2 feet BSG. Gravelly and sandy lean clays were encountered below the silty sands to depths of 5 to 7 feet BSG. The lean clay soils exhibit low to moderate shear strength and moderate compressibility characteristics.

Weathered greenstone bedrock was encountered below the lean clays to the maximum depths of exploration in the boring and test pits.

Based on the Potable Tank Section diagram provided by PACE it appears the grading for the tank pad will extend to a maximum of about 24 feet below the existing site grade. Soil and rock conditions revealed in the test boring and test pits suggest variable degrees of weathering and generally rippable conditions for the greenstone bedrock to the anticipated elevations

required for pad preparation. However, during test pit exploration, the backhoe was unable to excavate the pits to an even depth across the bottom of the test pits and encountered refusal at 8 to 12 feet BSG on relatively fresh greenstone rock in some portions of pits.

Field data suggests that some shallow groundwater may occur near the tank pad elevation. However, the amount of groundwater is anticipated to be relatively small and it appears that potential pore pressure and nuisance conditions would be adequately addressed by the french drain proposed outside of the wall foundation.

From a geotechnical standpoint, the site is suitable for the proposed tank provided the recommendations contained in this report are followed.

We anticipate that the pad will be cut to a maximum depth of about 23 feet BSG to achieve the designed tank bottom surface (at the center of the tank). The tank wall footings will be at depths ranging from about 10 to 23 feet below existing site grades. Field data indicates the base of the footings will be on variably weathered greenstone bedrock. Conditions at the proposed footing depths are anticipated to be predominantly competent greenstone. However, due to the irregular weathering profile, some lean clay soils are anticipated. Where lean clay soils are exposed at the bottom of foundation excavations, these soils should be excavated down to firm rock material and the excavations should be backfilled with a lean (2-sack) cement slurry to establish a level foundation bottom.

To address potential differential settlement of the tank bottom liner the tank pad should be prepared by ripping and moisture conditioning to a depth of 8 inches below pad grade and compacting soils as engineered fill. The intent of pad preparation is also to provide a uniform base free of sharp rocks which could puncture the bottom liner.

After excavation of the tank pad, and prior to placement of footings and the bottom liner, the subgrade should be reviewed by our firm to confirm the removal of soft or pliant areas.

A 25-foot high cut slope with a gradient of 2 horizontal (H) to 1 vertical (V) is proposed upslope of the tank. The majority of this cut is anticipated to be into weathered greenstone rock. Our observations of the greenstone rock materials exposed in test pits suggest that the proposed cut slope would be stable.

For stability, permanent fill and cut slopes should be constructed at 2H to 1V, horizontal to vertical, or flatter. Where fill is placed on native slopes steeper than 5H:1V a minimum 6 foot wide keyway should be constructed at the toe of fill slopes.

Analytical results of a near surface soil sample indicate the soils are "mildly corrosive". Buried metal objects should be protected in accordance with the manufacturer's recommendations based on a "mildly corrosive" corrosion potential of the soil. The evaluation was limited to the effects of soils to metal objects; corrosion due to other potential sources, such as stray currents and groundwater, was not evaluated.

Corrosion of concrete due to sulfate attack is not anticipated based on concentration of sulfates indicating a "negligible" exposure, as determined for the near-surface soils. Type I or II cement may be used as specified in Table No. 19-A-3 of the 1994 Uniform Building Code.

TABLE OF CONTENTS

TABLE OF CONTENTS

GEOTECHNICAL ENGINEERING INVESTIGATION

PROPOSED POTABLE WATER TANK

CORDEVALLE GOLF CLUB AND HOTEL

SAN MARTIN, CALIFORNIA

Project Number: D34301.02

1.0 INTRODUCTION

This report presents the results of a geotechnical engineering investigation for the proposed proposed potable water tank to be located at the Cordevalle Golf Club and Hotel, Subdivision and Country Club, San Martin, California.

The Twining Laboratories, Inc. (Twining) was authorized by written agreement on December 12, 1997 by Mr. Thomas Hix, with Lion's Gate Estate Partners, LLC, to conduct this geotechnical engineering investigation.

The contents of this report include the purpose of the investigation and the scope of services provided. The site history, previous studies, existing site features, and anticipated construction are discussed. In addition, a description of the investigative procedures used and the subsequent findings obtained are presented. Finally, the report provides an evaluation of the findings, general conclusions, and related recommendations. The three report appendices contain the drawings (Appendix A), the logs of test pits and borings (Appendix B), and the results of laboratory tests (Appendix C).

The Geotechnical Engineering Division of Twining, headquartered in Fresno, California, performed the investigation.

2.0 PURPOSE AND SCOPE OF INVESTIGATION

The purpose of the investigation was to conduct a field exploration and laboratory testing program, evaluate the data collected during the field and laboratory portions of the investigation, and provide the following:

a) General subsurface soil and groundwater conditions;

b) Recommendations for site preparation including preparation of subgrade soils as well as placement, moisture conditioning, and compaction of engineered fill soils;

c) Recommendations for cut and fill slopes;

d) Recommendations for temporary excavations and trench backfill;

e) Geotechnical parameters for use in design of foundations; and

f) Evaluation of soil corrosivity.

This report is provided specifically for the proposed potable water tank of the proposed Cordevalle Golf Club and Hotel, referenced in the Proposed Construction section of this report.

This investigation did not include a geologic/seismic hazards evaluation, floodplain investigation, compaction tests, environmental investigation, environmental audit, or investigation of soil conditions for a tank access road. The Cordevalle Golf Club and Hotel will consist of the development of a 41-lot residential development, 18 hole golf course and associated maintenance facilities, club house, tennis courts, overnight lodges, equestrian center, and winery.

Our proposal, dated December 12, 1997, outlined the scope of our services. The actions undertaken during the investigation are summarized as follows.

I. The following documents prepared by others were reviewed:

- Prepurchase Site Assessment of Geologic Hazards, Ground Water Supply and Environmental/Toxic Contamination, Hayes Valley Property, Santa Clara, California, Project 4297, prepared for LAND USE, by TERRATECH, INC., dated January 20, 1988;

- Supplemental Geological Reconnaissance Investigation for Proposed Hayes Valley Dams, Santa Clara County, California, prepared by Kaldveer Associates Geoscience Consultants, dated August 4, 1989;

- Geologic Input to Draft Environmental Impacted Report, Lion's Gate Development, project HRC-101B, prepared by Wahler Associates for HR Development Partners, dated April 17, 1990;

- Geologic Input to EIR, prepared by ENGEO Incorporated, date April 13, 1993;

- Geologic Feasibility Investigation, Golf Course Maintenance Building, The Lion's Gate Reserve, San Martin , California, Project 1385/6G, prepared for Hayes Valley Development Partners, by Pacific Geotechnical Engineering, dated December 1995;

- Preliminary Geologic Feasibility Evaluation, Homesites on Parcels #24, #25, and #26, The Lion's Gate Reserve, San Martin, California, Project 1385/7G, prepared for Hayes Valley Development Partners, by Pacific Geotechnical Engineering, dated December 1995;

- Geologic Feasibility Investigation, Clubhouse and Overnight Lodges, The Lion's Gate Reserve, San Martin, California, Project 1385/5G, prepared for Hayes Valley Development Partners, by Pacific Geotechnical Engineering, dated December 1995;

- Administrative Draft Environmental Impact Report, Volume IIa Technical Appendices, Lion's Gate Reserve, dated December 1995;

- Draft Environmental Impact Report, Volume II Technical Appendices B through E, Lion's Gate Reserve, dated March 1996; and

- Final Grading Plan, prepared by Pacific Advanced Civil Engineering, dated May 5, 1998.

II. The following geologic and geotechnical reports prepared by Twining were reviewed:

- Report entitled Preliminary Geotechnical Engineering Investigation, Golf Course, dated March 18, 1997, and Addendums No. 1 and No. 2;

- Letter report entitled "Review of Site Geologic Conditions and Grading Plans, Golf Course Phase", dated May 6, 1997;

- Report entitled "Preliminary Geotechnical Engineering Investigation, Clubhouse and Overnight Lodges" (former proposed site), dated October 30, 1997;

- Letter report entitled "Preliminary Evaluation of Geotechnical and Geological Feasibility, Clubhouse and Overnight Lodge Area" (proposed new site), dated April 16, 1998; and,

- Geologic and Geotechnical Site Review: New Clubhouse and Overnight Lodge Area, Cordevalle Golf Club and Hotel, dated May 29, 1998;

III. A site reconnaissance and subsurface exploration were conducted.

IV. Laboratory tests were conducted to determine selected physical and engineering properties of the subsurface soils.

V. Mr. Ron Davis (Lion's Gate Estate Partners, LLC), and Mr. Joseph Gutierrez (PACE) were consulted during the investigation.

VI. The data obtained from the investigation were evaluated to develop an understanding of the subsurface conditions and engineering properties of the subsurface soils.

VII. This report was prepared to present the purpose and scope, background information, field exploration procedures, findings, evaluation, conclusions, and recommendations.

3.0 BACKGROUND INFORMATION

The site history, previous studies, existing site features, and the anticipated construction are summarized in the following subsections.

3.1 Site History: The site appears to have been used for cattle grazing. No evidence of other site uses were noted during our field investigation.

3.2 Previous Studies: It is our understanding that no other studies have been conducted specifically for the proposed potable water tank site. Numerous engineering, geological, and environmental studies have been conducted for other portions of the Cordevalle development.

3.3 Site Description: The Cordevalle Golf Club and Hotel includes a 1,676 acre site of which 400 acres are to be developed, and the remainder is to remain undeveloped. The project site is located approximately west of the intersection of Highland and Turlock Avenues west of the City of San Martin in Santa Clara County, California. A site location map is presented on Drawing No. 1 in Appendix A.

The potable water tank site is located on an eastward sloping swale, about 4,000 feet northwest of the intersection of Highland and Turlock Avenues, and about one-half mile north of the golf course. The swale slopes at about 4H to 1V. The west edge of the proposed tank is approximately 125 feet downslope from the top of a broad ridgeline.

Oak trees are present on the hillside near the near the proposed tank site. Dry brown grasses of up to 3 feet high covered the surface soils at the time of our field investigation.

According to a geologic map of the site region prepared by Kaldveer Associates (scale: 1 inch = 500 feet, 1989) for the proposed Hayes Valley Dam, the tank is located on Franciscan Complex greenstone. A serpentinite belt is located approximately 500 feet west of the proposed tank site. The nearest mapped active or potentially active fault is the Sergant Fault, located 2.5 miles east of the site.

3.4 Proposed Construction: We understand the proposed potable water tank will include a 70-foot diameter reinforced concrete walled tank with an approximate capacity of 420,000 gallons. Approximately two-thirds of the tank height is below the adjacent native grade level. The tank will have an aluminum "TEMCOR" domed roof and a 36 mil Hypalon liner covering the sides and bottom of the tank. An 8 ounce nonwoven geotextile will be placed below the bottom portion of the tank liner. The bottom surface of the tank will be sloped toward the center at a 4H to 1V gradient. The reinforced concrete walls will be supported on a 3-foot wide perimeter spread foundation. A french drain will be installed outside the entire perimeter of the reinforced concrete tank wall.

A perimeter access road with a Class II aggregate base surface will be constructed around the tank.

Drawing 3 in Appendix A presents a cross section of the tank.

3.5 Proposed Construction Grading: Cuts of up to about 23 feet are proposed to achieve a level pad for the tank. The tank foundation is proposed to bear entirely on cut. Fills of about 2 to 5 feet are proposed along the downslope perimeter on the pad, beneath the perimeter access road.

4.0 INVESTIGATIVE PROCEDURES

The field exploration and laboratory testing program conducted for this investigation are summarized in the following subsections.

4.1 Field Exploration: The field exploration consisted of a site reconnaissance, drilling of a test boring, excavation of test pits, and soil sampling. The test boring and test pit locations are shown on Drawing No. 2 in Appendix A. Due to the relatively steep gradient of ground surface at the proposed tank site, the drill rig could not access test boring locations within the tank footprint. However, one test boring was drilled approximately 120 west of the proposed west edge of the tank, near a level natural ridge.

Test boring and pit locations were determined by pacing with reference to survey stakes placed at the center and on the perimeter of the proposed tank. The locations, as described, should be considered accurate to within 15 feet.

4.1.1 Site Reconnaissance: The site reconnaissance consisted of walking the site and noting visible surface features. The reconnaissance was conducted by Mr. Kenneth Clark on July 7 1998. The features noted are described in the background information (Section 3.0).

4.1.2 **Drilling Test Borings:** On July 7, 1998 one (1) test boring was drilled west of the proposed tank site, approximately 120 feet from the edge of the proposed tank. The boring was advanced to a depth of 41.5 feet BSG.

Under the direction of Twining's engineering geologist, the test boring was drilled using a CME-75 drill rig equipped with 6 5/8 inch hollow-stem augers. The soils encountered in the test boring were logged by Twining's field engineer. The field soil classification was in accordance with the Unified Soil Classification System and consisted of particle size, color, and other distinguishing features of the soil.

The presence and elevation of free water, if any, in the borings were noted and recorded during drilling and immediately following completion of borings.

Elevations of the test borings were not measured as a part of the investigation. The test borings were loosely backfilled with material excavated during the drilling operations; thus, some settlement should be anticipated.

4.1.3 **Excavation of Test Pits:** On July 7, 1998, two (2) test pits were excavated below the plan area of the proposed tank. These pits were excavated to depths of 7 and 10 feet BSG. Under the direction of a Twining engineering geologist, the test pits were excavated using a backhoe equipped with a 24 inch wide bucket.

The test pits were loosely backfilled with excavation material; thus, some settlement should be anticipated. Portions of the pits located outside the cut areas should be re-excavated and replaced as engineered fill during earthwork operations.

4.1.4 **Soil Sampling:** Standard penetration tests were conducted, and both disturbed and undisturbed soil samples were obtained.

The standard penetration resistance, N-value, is defined as the number of blows required to drive a standard split barrel sampler into the soil. The standard split barrel sampler has a 2 inch O.D. and a 1-3/8 inch inside diameter (I.D.). The sampler is driven by a 140 pound weight free falling 30 inches. The sampler is lowered to the bottom of the bore hole and set by driving it an initial 6 inches. It is then driven an additional 12 inches and the number of blows required to advance the sampler the additional 12 inches is recorded as the N-value.

Relatively undisturbed soil samples for laboratory tests were obtained by pushing or driving a California modified split barrel ring sampler into the soil. The soil was retained in brass rings, 2.5 inches O.D. and 1 inch in height. The lower 6 inch portion of the samples were placed in close-fitting, plastic, air-tight containers which, in turn, were placed in cushioned boxes for transport to the laboratory.

Soil samples obtained were taken to Twining's laboratory for classification and testing.

4.2 Laboratory Testing: The laboratory testing was programmed to determine selected physical and engineering properties of the soils underlying the site. The tests were conducted on disturbed and undisturbed samples representative of the subsurface material.

The results of laboratory tests are summarized on Figure Nos. 1 through 4 in Appendix C. These data, along with the field observations, were used to prepare the final test boring and test pit logs in Appendix B.

5.0 FINDINGS

The findings of the field exploration and laboratory testing are summarized in the following subsections.

5.1 Soil Profile: Silty sands were encountered from the ground surface to depths of approximately 1 to 2 feet BSG. The root systems of grasses and weeds along with desiccation cracking extended to depths of about 18 to 24 inches. Beneath the silty sands, the soils encountered were sandy and gravelly lean clays. Weathered greenstone bedrock was encountered at depths of 5 to 7 feet BSG, extending to the maximum depths explored in the test boring (41.5 feet BSG) and test pits (7 and 10 feet BSG).

The foregoing is a general summary of the soil conditions encountered in the test pits drilled for this investigation. Detailed descriptions of the soils encountered at the test boring and test pits are presented on the logs of test borings in Appendix B. The stratification lines shown on the logs represent the approximate boundary between soil types; the actual in-situ transition may be gradual.

5.2 Soil Engineering Properties: The natural moisture content measured in a sample of the silty sand was 5 percent.

The natural moisture content measured in samples of the lean clay ranged from 2 to 13 percent. A maximum density/optimum moisture determination performed on one near-surface soil sample indicated a maximum dry density of 114.8 pounds per cubic foot at an optimum moisture content of 18.8 percent.

The natural moisture content measured in samples of the weathered greenstone rock ranged from 2 to 5 percent and one in-place density test revealed a dry density of 125 pounds per cubic foot. A direct shear test performed on a lean clay sample indicated and angle of internal friction of 28 degrees, with a cohesion value of 369 pounds per square foot. The weathered greenstone soils exhibited moderate compressibility characteristics with the addition of moisture as indicated

by one consolidation test (about 8.2 percent consolidation under a load of 4 kips per square foot). Upon inundation, the soils exhibited low collapse potential (about 1.6 percent collapse under a load of 0.5 kips per square foot).

5.3 Groundwater Conditions: Groundwater was not encountered in the test pits excavated below the proposed tank location to a maximum depth of 10 feet BSG. Wet soil and rock material was encountered at a depth of 35 feet (estimated to be 15 to 20 feet below existing site grade at the proposed center of the tank. However, free groundwater was not encountered in the test boring to the maximum depth of exploration of 41.5 feet BSG.

It should be recognized that water table elevations and potentiometric conditions fluctuate with time, since they are dependent upon seasonal precipitation, irrigation, land use, and climatic conditions as well as other factors. Therefore, water level observations at the time of the field investigation may vary from those encountered both during the construction phase and the design life of the project. The evaluation of such factors was beyond the scope of this investigation and report.

6.0 EVALUATION

The data and methodology used to develop conclusions and recommendations for project design and preparation of construction specifications are summarized in the following subsections. The evaluation was based upon the subsurface conditions determined from the investigation and our understanding of the proposed construction.

6.1 Soil, Rock, and Groundwater Conditions: The soil conditions encountered in the test boring and test pits were relatively consistent across the project site as indicated on the test boring and test pit logs (Appendix B). The near surface soils were silty sands to depths of about 1 to 2 feet BSG. Hard gravelly and sandy lean clays were encountered below the silty sands to depths of 5 to 7 feet BSG. Weathered greenstone bedrock was encountered below the lean clays to the maximum depths of exploration in the boring and test pits. The lean clay soils exhibit low to moderate shear strength and moderate compressibility characteristics.

Bedrock was encountered during the field investigation at depths of 5 to 7 feet BSG. Based on the Potable Tank Section diagram provided by PACE it appears the grading for the tank pad will extend to a maximum of about 24 feet below the existing site grade. Soil and rock conditions revealed in the test boring and test pits suggest variable degrees of weathering and generally rippable conditions for the greenstone bedrock to the anticipated elevations required for pad preparation. However, during test pit exploration, the backhoe was unable to excavate the pits to a consistent depth, suggesting variable weathering conditions across the test pits.

Based on field data (subsection 5.3), and considering the proposed tank location near the top of a broad ridgeline, we anticipate that some shallow groundwater may occur near the tank pad elevation. However, the amount of groundwater is anticipated to be relatively small and it appears that potential pore pressure and nuisance conditions would be adequately addressed by the french drain proposed on the outside of the wall foundation.

6.2 Stability of Native and Proposed Cut Slopes: Maximum native slopes within the swale at the proposed tank location range from about 4H to 1V to 5H to 1V. Our investigation did not reveal evidence of existing slope failure near the proposed tank location. Native slopes in the area of the proposed tank appear relatively stable.

A 25-foot cut slope with a gradient of 2H to 1V is proposed upslope of the tank. The majority of this cut is anticipated to be into weathered greenstone rock. Our observations of the greenstone rock materials exposed in test pits suggest that the proposed cut slope would be stable.

6.3 Faults: The project site is located in a seismically active region with numerous active and potentially active faults. The nearest mapped active or potentially active fault is the Sergant Fault, located 2.5 miles east of the site. Several bedrock faults associated with melange terrace have been mapped by others on the Cordevalle development site. Our review of data presented in geologic reports previously generated for the development project indicates that the bedrock faults in the site area are inactive.

6.4 Liquefaction and Seismic Settlement: Seismic shaking may induce settlement of loose, unconsolidated sediments. This can occur in unsaturated and saturated granular soils. Considering the shallow bedrock below the tank site (absence of loose or granular soils), the potential for significant seismic induced settlement or liquefaction is considered very low.

6.5 Site Preparation: Proposed grading indicated on the tank section plan (prepared by PACE, dated July 13, 1998) indicates that cuts of up to 23 feet will be required to construct the tank pad. Fills of up to about 5 feet are anticipated along the perimeter of the downslope portion of the access road. All fills should be placed as compacted engineered fill. Areas to receive fill soils should be prepared to receive these fills by stripping surface organics and loose soils, scarifying to a minimum depth of 8 inches and compacting as engineered fill. Due to organic material noted in the near surface soils, stripped soils are not considered suitable for use as fills in structural areas.

Stripped topsoil may be stockpiled and reused in landscape areas or as erosion resistant materials at the discretion of the owner or residential development architect. It should be anticipated that topsoil will settle about 1 inch per foot of thickness of stripped soils as a result of decay of organic material. Therefore, it is also preferred that stripped soils not be placed in areas which will experience frequent foot traffic. These stripped soils should be placed in out-of-way areas

where the anticipated long term settlement will not pose a safety concern or require constant regrading.

Often when fill soils are placed on sloping terrain, the fill soils will migrate downhill due to gravity, with slippage occurring on the plane between the fill soils and the native subgrade. To reduce the potential for this movement, the fill soils placed on slopes steeper than 5H:1V should be prepared to receive engineered by benching and keying into the stiff and competent native soils or bedrock to reduce the potential for a failure plane between the fill soils and the native materials. Based on the native slope grades at the site and the thickness of fill soils proposed, construction of one keyway will be required prior to placement of engineered fill. Keyway or benches should be a minimum of 6 feet wide.

6.6 **Cut and Fill Slopes:** For slope stability, permanent slopes should be constructed such that both cut and fill slopes are 2H to 1V or flatter. If slopes are to be graded steeper than 2H to 1V, these slopes should be evaluated by the geotechnical engineer on a case by case basis. It is anticipated that relatively steep temporary cut slopes of about 10 feet in height will be required for construction of the concrete wall footing and french drains. Observations of test pits and soil and rock conditions suggest that near vertical cuts may be stable on a temporary bases. However, considering the weathered nature of the greenstone bedrock, temporary excavations in weathered rock should not be graded steeper than 3/4H to 1V unless evaluated by a geotechnical engineer. Temporary excavations in soils should not be graded steeper than 1H to 1V unless evaluated by a geotechnical engineer.

Run-on of surface water onto the proposed 2H to 1V cut slope could cause erosion, and increased moisture content and soil unit weight. These factors would tend to decrease the long term stability of the proposed cut slope. Accordingly, a brow ditch, should be provided to direct surface water away from the cut slope. In addition, the cut slope should be maintained and protected with proper cover, such as shallow rooted vegetation, to reduce erosion and aid in stability. If the slope is landscaped, irrigation should be drip type or one with equivalent lack of runoff.

6.7 **Tank Foundation and Bottom:** Tank wall footings are proposed at depths ranging from about 10 to 23 feet below existing site grades. Test boring and test pit data indicate that the base of the footings will be on variably weathered greenstone bedrock. Conditions at the proposed footing depths are anticipated to be predominantly competent greenstone. However, due to the irregular weathering profile, some lean clay soils are anticipated. Where lean clay soils are exposed at the bottom of foundation excavations, these soils should be excavated down to firm rock material. The excavations should be backfilled with a low-compressible engineered fill material or lean (2-sack) cement slurry to establish a level foundation bottom.

The tank walls and bottom are to be lined with a 36 mil potable Hypalon material. Considering that variable weathered soil and rock conditions are anticipated at the bottom of the tank, some differential settlement of the bottom liner may occur. Although it is anticipated that the proposed bottom liner can accommodate some differential settlement, soil materials exposed on the tank pad should be prepared to so that a relatively smooth (regular) tank bottom surface is maintained during filling and operation of the tank. Preparation should include ripping and moisture conditioning to a depth of 8 inches below pad grade and compacting soils as engineered fill. This would also provide a provide a uniform base relatively free of sharp rocks which could puncture the bottom liner. The liner manufacturer should be consulted to assess whether the site preparation recommendations are consistent with the tear resistance of the liner material.

After excavation of the tank pad, and prior to placement of footings or liner, the subgrade should be reviewed by our firm to confirm the removal of soft or pliant areas.

6.8 **Corrosion Protection:** The risk of corrosion of construction materials relates to the potential for soil-induced chemical reaction. The rate of deterioration depends on soil resistivity, texture, acidity, and chemical concentration. The evaluation of potential corrosion for the tank was based on the results of an analyses of a composite sample collected from the location of proposed lot 8 of the Cordevalle residential development, about 2,000 feet south of tank site. Review of soil chemical test data for similar soils in the Cordevalle project area suggest that these results represent soil chemical conditions at the subject site.

Results of the analysis indicate a resistivity value of 21,600 ohms/cm and a pH value of 6.0. These values indicate the soils are "mildly corrosive". In addition, the results of the two soil sample analyses indicated a "none-detected" concentration of sulfate (less than the detection limits of 0.01 weight percent), and a chloride concentration of 0.0013 weight percent. We recommend that these soil corrosion data be provided to the manufacturer's or supplier's of materials that will be in contact with soils (pipes or ferrous metal objects, etc.) to provide assistance in selecting the protection and materials for the proposed products or materials. If the manufacturer's or supplier's cannot determine if materials are compatible with the soil corrosion conditions, a professional consultant, i.e. a corrosion engineer, with experience in corrosion protection should be consulted to provide design parameters.

7.0 CONCLUSIONS

Based on the data collected during the field and laboratory investigations, our geotechnical experience in the vicinity of the project site, and our understanding of the anticipated construction, we present the following general conclusions.

7.1 The site is suitable for the proposed construction with regard to support of the proposed tank, foundations, and concrete slabs-on-grade, provided the recommendations contained in this report are followed. It should be noted that the recommended design consultation and construction monitoring by Twining are integral to this conclusion.

7.2 The soil/rock conditions encountered comprised silty sands to depths of about 1 to 2 feet BSG, underlain by lean clay to a depth of 5 to 7 feet BSG. Weathered greenstone bedrock was encountered below the lean clay to the maximum depth of exploration of 41.5 feet BSG.

7.3 Field data suggests that some shallow groundwater may occur near the tank pad elevation. The proposed french drain appears adequate to provide subsurface drainage away the wall foundation (retaining wall).

7.4 After excavation of the tank pad, and prior to placement of footings or liner, the subgrade should be reviewed by our firm to confirm the removal of soft or pliant areas.

7.5 The bottom of the tank may be supported on hard greenstone, on low compressive engineered fill, or on a 2-sack sand cement slurry extending to hard greenstone rock (slurry required to fill areas of overexcavated highly weathered greenstone).

7.6 The tank pad should be prepared by moisture conditioning and compacting exposed native soils as engineered fill to a depth of 8 inches.

7.7 Total and differential settlements for the proposed tank are estimated to be 1 inch or less.

7.8 The potential for liquefaction and seismic settlement are very low based on the absence of granular soils at the site.

7.9 Proposed permanent slopes of 2H to 1V or flatter are anticipated to remain stable during the design life of the structure. If permanent slopes are to be graded steeper than 2H to 1V, these should be evaluated by the geotechnical engineer on a case by case basis. Temporary excavations in lean clay or silty sand soils should not be graded steeper than 1H to 1V. Temporary excavations in weathered rock should not be graded steeper than 3/4H to 1V, unless evaluated by a geotechnical engineer.

7.10 The analytical result of a soil sample analysis indicates that the near-surface soils exhibit a "mildly corrosive" corrosion potential to buried metal objects.

7.11 The analytical result of a soil sample analyses indicate sulfate concentrations of "none detected" and a chloride concentration of 0.0013 percent by dry weight. Therefore, a low potential for sulfate attack on reinforced concrete placed in the near-surface soils is anticipated.

8.0 RECOMMENDATIONS

Based on the evaluation of the field and laboratory data and our geotechnical experience in the vicinity of the project, we present the following recommendations for use in the project design and construction. However, this report should be considered in its entirety. When applying the recommendations for design, the background information, procedures used, findings, evaluation, and conclusions should be considered. The recommended design consultation and construction monitoring by Twining are integral to the proper application of the recommendations.

8.1 Site Grading and Drainage

8.1.1 Develop and maintain site grades which will drain surface runoff away from the tank walls - both during and after construction. Adjacent exterior finished grades should be sloped a minimum of two percent for a distance of at least five feet away from the tank to preclude ponding of water adjacent to the tank.

8.1.2 Landscaping after construction should direct rainfall and irrigation runoff away from the structure and not promote ponding of water adjacent to the structures. Care should be taken to maintain a leak-free sprinkler system.

8.2 Site Preparation

8.2.1 All topsoil, vegetation, organics, and debris should be removed from the proposed tank and roadway areas. The general depth of stripping should be sufficiently deep to remove the root systems and organic topsoils. For estimate purposes, a minimum stripping depth of 6 inches should be used. The actual depth of stripping should be reviewed by our firm at the time of construction. Deeper stripping may be required in localized areas. Stripping should extend laterally a minimum of 5 feet outside the tank and roadway perimeters. These materials will not be suitable for use as engineered fill; however, stripped topsoil may be stockpiled and reused in landscape areas at the discretion of the owner. It should be anticipated

that topsoil will settle about 1 inch per foot of thickness as a result of decay of organic material.

8.2.2 We anticipate that the pad will be cut to a maximum depth of about 23 feet to achieve the designed tank bottom surface. This excavation would remove the loose near surface silty sand soils. Along the perimeter of the pad (where fill is to be placed) care should be taken to remove the loose silty sand soils to a minimum depth of 1 foot BSG prior to placement of the fill.

8.2.3 If fill soils are to be placed on slopes steeper than 5H:1V the slopes should be prepared to receive engineered keying into the stiff and competent native soils or bedrock at the to of the fill slope.

8.2.4 After stripping, excavation of the tank pad, and prior to placement of engineered fill, the subgrade should be reviewed by Twining to confirm the removal of topsoil, organics, and soft or pliant areas.

8.2.5 The bottoms of keyways and footings should be reviewed by Twining prior to placement of overlying materials.

8.2.6 The exposed ground surface in areas to receive engineered fill material should be scarified to a depth of 8 inches, moisture conditioned in accordance with subsection 8.3.1, and compacted as engineered fill. The zone of scarification and compaction should extend laterally a minimum of 5 feet outside the perimeters of the fill area. The scarification and compaction should be conducted following stripping operations, removal of subsurface structures, over-excavation, and removal of all soft or pliant areas.

8.2.7 All fill required to bring the site to final grade should be placed as engineered fill. In addition, all native soils over-excavated should be compacted on-site as engineered fill.

8.3 Engineered Fill

8.3.1 All fills should be placed as compacted engineered fill. The on-site soils and rock encountered are predominantly silty sands, lean clays, and weathered greenstone. The silty sand and lean clay soils will be suitable for use as fill material to support the structural loads, provided they are free of organics and debris and the moisture content of the soil is two to five percent over optimum moisture content at the time of placement for

the lean clays, or within 2 percent of optimum for the sandy soils. If soils other than those considered in this report are encountered, Twining should be notified to provide alternate recommendations. If the near surface silty sand soils are used, these soils should be moisture conditioned to within two percent of optimum moisture and compacted as engineered fill.

8.3.2 The compactability of the native soils is dependent upon the moisture contents, subgrade conditions, degree of mixing, type of equipment, as well as other factors. The evaluation of such factors was beyond the scope of this report; therefore, we recommend that they be evaluated by the contractor during preparation of bids and construction of the project.

8.3.3 Engineered fill soil should be placed in loose lifts approximately 8 inches thick, moisture-conditioned to 2 to 5 percent above optimum, and compacted to a dry density of at least 90 percent of the maximum dry density as determined by ASTM Test Method D1557-78. Additional lifts should not be placed if the previous lift did not meet the required dry density or if soil conditions are not stable.

8.3.4 Backfill material behind the tank wall should be non-expansive sandy soils or crushed rock material. These non-expansive materials will have good draining characteristics. If an open graded material is used in the french drain, a filter fabric such as Mirifi 140NS should separate the drain material from the finer grained fill material to minimize mixing and volume losses.

8.4 Tank Foundation and Bottom

8.4.1 Structural loads from the tank may be supported on either a ring foundation, strip footings, or on gravel or sand over the native subgrade. Ring or strip foundations should be supported on a minimum of 12 inches of engineered fill. Spread and continuous footings, a minimum of 1 foot deep and 1 foot wide, may be designed for a maximum gross allowable soil bearing pressure of 3,000 pounds per square foot for dead-plus-live loads. Gross allowable soil bearing pressure is the maximum contact pressure at the base of the foundations. These values may be increased by one-third for short duration wind or seismic loads.

8.4.2 A structural engineer experienced in perimeter foundation design for tanks should recommend the reinforcement, thickness, design details and concrete specifications for the tank foundation.

8.4.3 A total settlement of 1 inch should be anticipated for design. A differential settlement of 1 inch from the center to edge of the tank should also be anticipated for design.

8.4.4 The tank bottom subgrade should be prepared by moisture conditioning and compacting soils as engineered fill to a depth of 8 inches.

8.4.5 The tank connections to exterior structures and pipelines should be designed with flexible connections such that a minimum of 2 inches of settlement can occur without causing damage (more than the predicted settlements to allow for variances in the actual settlement).

8.5 Frictional Coefficient and Earth Pressures

8.5.1 The bottom surface area of concrete footings or concrete slabs in direct contact with engineered fill can be used to resist lateral loads (areas of slabs underlain by a synthetic moisture barrier cannot be considered). An ultimate coefficient of friction of 0.36, reduced by an appropriate factor of safety, can be used for design.

8.5.2 The ultimate passive resistance of the native soils and engineered fill may be assumed to be equal to the pressure developed by a fluid with a density of 300 pounds per cubic foot. An appropriate factor of safety should be applied.

8.5.3 The passive pressure was calculated based on a minimum soil unit weight of 100 pounds per cubic foot. The soils within the passive zone at the foot of retaining walls (one footing width in front of the wall to a depth equal to the footing depth) should be tested to verify that the soils have the minimum unit weight of 100 pounds per cubic foot (with moisture). If the soils have a unit weight of less than 100 pounds per cubic foot, the soils within this zone should be over-excavated and replaced as engineered fill. These soils should be tested prior to backfilling behind the wall.

8.5.4 A minimum factor of safety of 1.5 should be used for the lateral resistance, or as required by the governing building codes. The frictional and passive resistance of the soil may be combined in determining the total lateral resistance. The upper 12 inches of subgrade should be neglected in determining the total passive resistance.

8.5.5 The active and at-rest pressures of the native soils and engineered fill may be assumed to be equal to the pressures developed by a fluid with a density of 43 and 65 pounds per cubic foot, respectively. These pressures assume level ground surface and do not include the surcharge effects of construction equipment, loads imposed by nearby foundations and roadways and hydrostatic water pressure.

8.5.6 The active and at-rest pressures were calculated based on a maximum soil unit weight of 130 pounds per cubic foot. The compacted soils behind the retaining walls should not have a compacted unit weight above 130 pounds per cubic foot (with moisture). If the soils have a unit weight of greater than 130 pounds per cubic foot, the soils should be over-excavated and replaced at a lower degree of compaction. If the backfill soils must be placed at a unit weight of over 130 pounds per cubic foot to achieve minimum compaction requirements the material should not be used as backfill behind retaining walls.

8.5.7 The at-rest pressure should be used in determining lateral earth pressures against walls which are not free to deflect. For walls which are free to deflect at least one percent of the wall height at the top, the active earth pressure may be used.

8.6 Temporary Excavations

8.6.1 It is the responsibility of the contractor to provide safe working conditions with respect to excavation slope stability.

8.6.2 Temporary excavations should be constructed in accordance with CALOSHA requirements. Temporary cut slopes in weathered rock should not be steeper than 3/4H to 1V, and flatter if possible. Temporary cut slopes in lean clay or silty sand soils should not be steeper than 1H to 1V. If excavations can not meet this criteria, the temporary excavations should be shored.

8.6.3 Shoring systems, if used, should be designed by an engineer with experience in designing shoring systems and registered in the State of California.

8.7 Utility Trenches

8.7.1 The type of pipe bedding, the initial backfill and compaction requirements of bedding and initial backfill material should be specified by the project Civil Engineer based on either the manufacturers requirements, or ASTM D-2321 for flexible polyvinylchloride (PVC) pipe, whichever is more stringent.

8.7.2 Utility trench backfill placed in or adjacent to building areas, exterior slabs or pavements should be moisture conditioned to within two percent of the optimum moisture content and compacted to at least 92 percent of the maximum dry density as determined by ASTM Test Method D1557-78. The contractor should use appropriate equipment and methods to avoid damage to utilities and/or structures during placement and compaction of the backfill materials.

8.7.3 When utility trench backfills are determined by Twining to be nonstructural backfills, they should be compacted to a minimum of 90 percent of the maximum dry density as determined by ASTM Test Method D1557-78.

8.7.4 Trench backfill should be placed in 8 inch lifts, moisture conditioned to within 2 percent of optimum and compacted to achieve the minimum relative compaction. Lift thickness can be increased if contractor can demonstrate the minimum compaction requirements can be achieved.

8.7.5 On-site soils and approved imported engineered fill may be used as final backfill in trenches.

8.7.6 Jetting of trench backfill is not recommended to compact the backfill soils.

8.8 Cut and Fill Slopes

8.8.1 For stability, permanent fill and cut slopes should be constructed at 2H to 1V, or flatter.

8.8.2 Where fill is placed on native slopes steeper than 5H to 1V, a minimum 6 foot wide keyway should be constructed at the toe of fill slopes.

8.8.3 Based on the nature of the slopes in the vicinity of the tank pad a minimum setback of 20 feet should be sufficient. This setback could be adjusted based on our review of the final grading plans. The setback should be measured between the bottom of the tank foundation, horizontally to the slope face.

8.8.4 Develop and maintain site grades which will drain surface and roof runoff away from the slopes both during and after construction.

8.8.5 The slopes should be graded to promote sheet type flow. Brow ditches should be constructed at the top of the cut slope to intercept potential runon water and channel it away from the slope faces.

8.8.6 A shallow rooted ground cover type of vegetation should be planted on the slopes to prevent erosion and aid in stability. Areas particularly susceptible to erosion and not amenable to successful vegetation should be protected with other techniques such as the use of jute netting or geotextile erosion control mats. Irrigation should be of a drip type or micro sprinkler system which does not generate surface runoff.

8.8.7 During earthwork operations, keyways should be observed by our firm to determine if the subsurface conditions are compatible with those used in our evaluation and design.

8.9 Corrosion Protection

8.9.1 Based on the ASTM Special Technical Publication 741 and the analytical results of a near surface soil sample, the soils range are "mildly corrosive". Buried metal objects should be protected in accordance with the manufacturer's recommendations based on a "corrosive" corrosion potential of the soil. The evaluation was limited to the effects of soils to metal objects; corrosion due to other potential sources, such as stray currents and groundwater, was not evaluated.

8.9.2 Corrosion of concrete due to sulfate attack is not anticipated based on concentration of sulfates indicating negligible exposure, as determined for the near-surface soils. Type I or II cement may be used as specified in Table No. 19-A-3 of the 1994 Uniform Building Code.

8.9.3 We recommend that these soil corrosion data be provided to the manufacturer's or supplier's of materials that will be in contact with soils (pipes or ferrous metal objects, etc.) to provide assistance in selecting the protection and materials for the proposed products or materials. If the manufacturer's or supplier's cannot determine if materials are compatible with the soil corrosion conditions, a professional consultant, i.e. a corrosion engineer, with experience in corrosion protection should be consulted to design parameters.

9.0 DESIGN CONSULTATION

9.1 Twining should be provided the opportunity to review those portions of the contract drawings and specifications that pertain to earthwork and foundations prior to finalization to determine whether they are consistent with our recommendations. This service is part of this current contractual agreement.

9.2 It is the client's responsibility to provide plans and specification documents for our review prior to their issuance for construction bidding purposes.

9.3 If Twining is not afforded the opportunity for review, we assume no liability for the misinterpretation of our conclusions and recommendations. This review is documented by a formal plan/specification review report provided by Twining.

10.0 CONSTRUCTION MONITORING

10.1 It is recommended that Twining be retained to observe the excavation, earthwork, and foundation phases of work to determine that the subsurface conditions are compatible with those used in the analysis and design.

10.2 Twining can conduct the necessary observation, field testing services and provide results so that action necessary to remedy indicated deficiencies can be taken in accordance with the plans and specifications. Upon completion of the work, we will provide a written summary of our observations, field testing and conclusions regarding the conformance of the completed work to the intent of the plans and specifications. This service is not, however, part of this current contractual agreement.

10.3 The construction monitoring is an integral part of this investigation. This phase of the work provides Twining the opportunity to verify the subsurface conditions interpolated from the soil test pits and make alternative recommendations if the conditions differ from those anticipated.

10.4 If Twining is not afforded the opportunity to provide engineering observation and field testing services during construction activities related to earthwork, foundations, pavements and trenches; then, Twining will not be responsible for compliance of any aspect of the construction with our recommendations or performance of the structures or improvements if the recommendations of this report are not followed. We recommend that if a firm other than Twining is selected to conduct these services that they provide evidence of professional liability insurance of at least $1,000,000 and review this report. After their review, the firm should, in writing, state that they understand and agree with the conclusions and recommendations of this report and agree to conduct sufficient observations and testing to ensure the construction complies with this report's recommendations. Twining should be notified, in writing, if another firm is selected to conduct observations and field testing services prior to construction.

10.5 Upon the completion of work, a final report should be prepared by Twining per the requirements of the Uniform Building Code, Chapter 33A, "Excavation and Grading," Section 3318.1, "Final Reports". This report is essential to ensure that the recommendations presented are incorporated into the project construction, and to note any deviations from the project plans and specifications. The client should notify Twining upon the completion of work to provide this report. This service is not, however, part of this current contractual agreement.

11.0 NOTIFICATION AND LIMITATIONS

11.1 The conclusions and recommendations presented in this report are based on the information provided regarding the proposed construction, and the results of the field and laboratory investigation, combined with interpolation of the subsurface conditions between test pit locations.

11.2 The nature and extent of subsurface variations between test pits may not become evident until construction.

11.3 If variations or undesirable conditions are encountered during construction, Twining should be notified promptly so that these conditions can be reviewed and our recommendations reconsidered where necessary. It should be noted that

unexpected conditions frequently require additional expenditures for proper construction of the project.

11.4 If the proposed construction is relocated or redesigned, or if there is a substantial lapse of time between the submission of our report and the start of work (over 12 months) at the site, or if conditions have changed due to natural cause or construction operations at or adjacent to the site, the conclusions and recommendations contained in this report should be considered invalid unless the changes are reviewed and our conclusions and recommendations modified or approved in writing.

11.5 Changed site conditions, or relocation of proposed structures, may require additional field and laboratory investigations to determine if our conclusions and recommendations are applicable considering the changed conditions or time lapse.

11.6 The conclusions and recommendations contained in this report are valid only for the project discussed in Section 3.4, Proposed Construction. The use of the information and recommendations contained in this report for structures on this site not discussed herein or for structures on other sites not discussed in Section 3.3, Site Description is not recommended. The entity or entities that use or cause to use this report or any portion thereof for another structure or site not covered by this report shall hold Twining, its officers and employees harmless from any and all claims and provide Twining's defense in the event of a claim.

11.7 This report is issued with the understanding that it is the responsibility of the client to transmit the information and recommendations of this report to developers, owners, buyers, architects, engineers, designers, contractors, subcontractors, and other parties having interest in the project so that the steps necessary to carry out these recommendations in the design, construction and maintenance of the project are taken by the appropriate party.

11.8 This report presents the results of a geotechnical engineering investigation only and should not be construed as an environmental audit or study.

11.9 Our professional services were performed, our findings obtained, and our recommendations prepared in accordance with generally-accepted engineering principles and practices in Santa Clara County as of June 1998. This warranty is in lieu of all other warranties either expressed or implied.

11.10 Reliance on this report by a third party (i.e., that is not a party to our written agreement) is at the party's sole risk. If the project and/or site is purchased by another party, the purchaser must obtain written authorization and sign an agreement with Twining in order to rely upon the information provided in this report for design or construction of the project.

We appreciate the opportunity to be of service to Lion's Gate Estate Partners, LLC. If you have any questions regarding this report, or if we can be of further assistance, please contact us at your convenience.

Sincerely,
THE TWINING LABORATORIES, INC.

REGISTERED GEOLOGIST
KENNETH JAMES CLARK
No. EG 1864
CERTIFIED ENGINEERING GEOLOGIST
STATE OF CALIFORNIA

5-31-98

Kenneth J. Clark, CEG
Engineering Geologist
Geotechnical Engineering Division

REGISTERED PROFESSIONAL ENGINEER
SCOTT KRAUTER
No. GE2358
Exp. 12/31/00
GEOTECHNICAL
STATE OF CALIFORNIA

Scott W. Krauter, RCE, RGE
Manager
Geotechnical Engineering Division

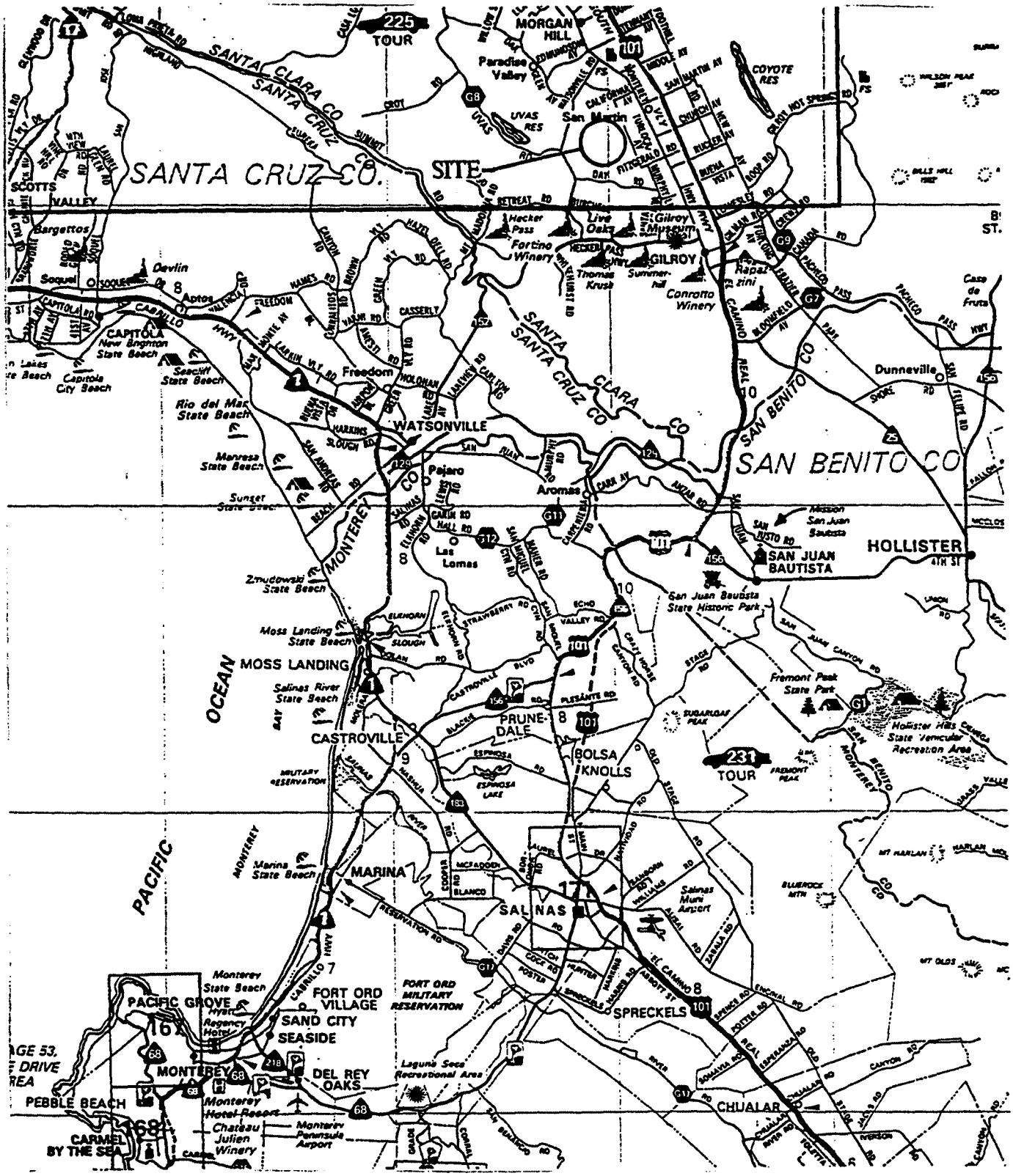
APPENDIX A

DRAWINGS

Drawing No. 1 - Site Location Map

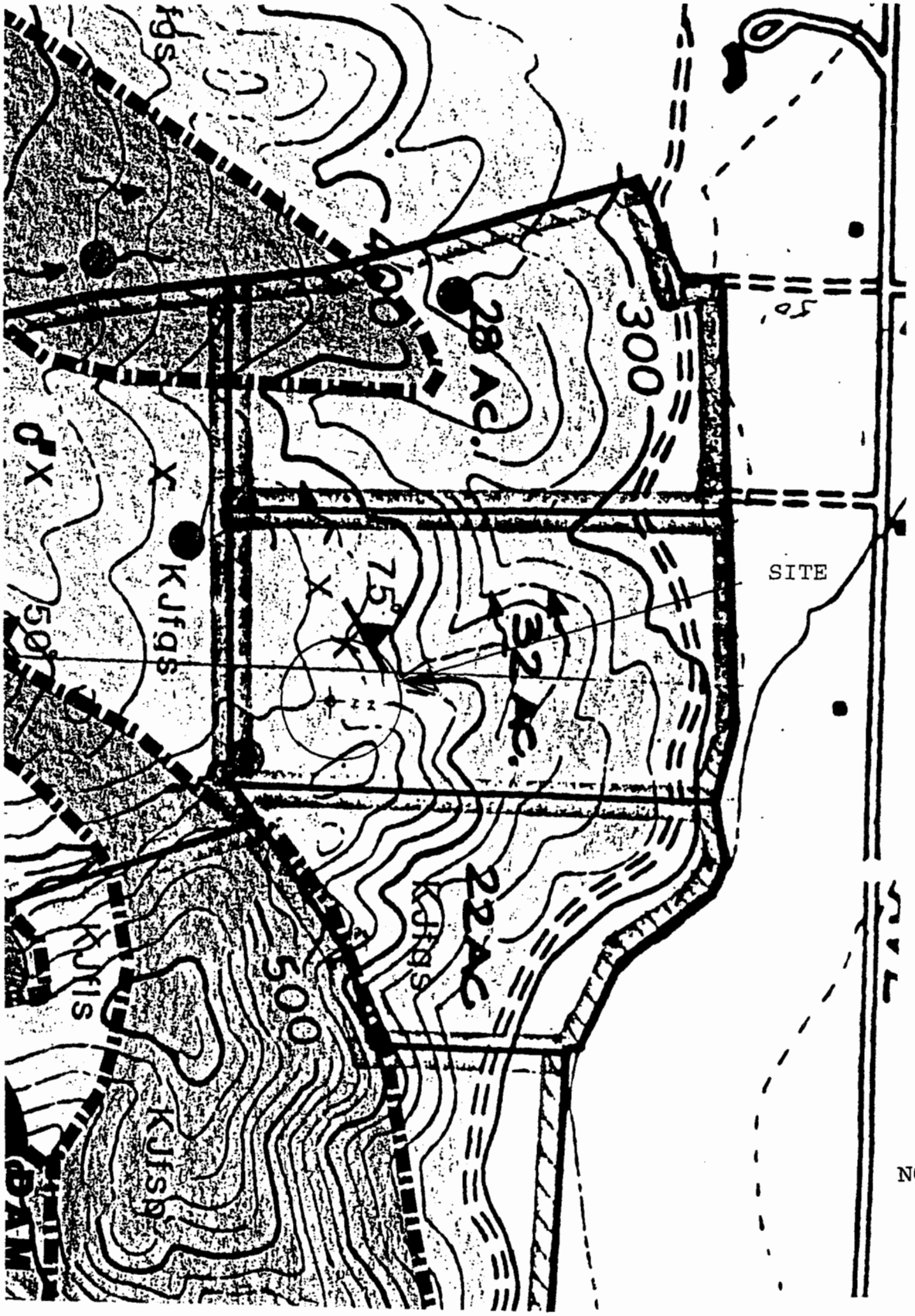
Drawing No. 2 - Site Plan with Test Boring and Test Pit Locations

Drawing No. 3 - Tank Cross-Section



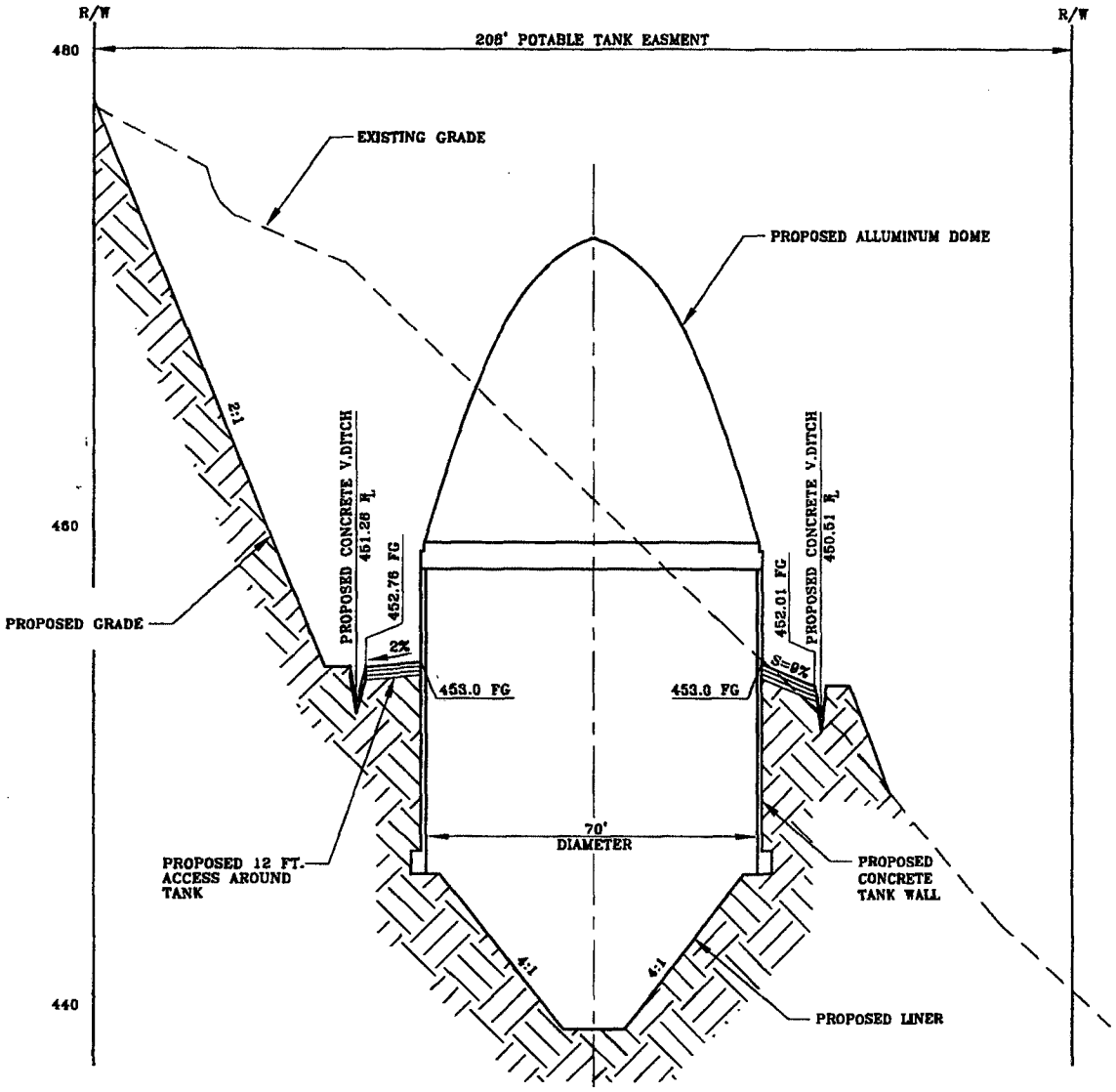
SITE LOCATION MAP CORDEVALLE GOLF CLUB & HOTEL SAN MARTIN, CALIFORNIA	FILE NO.: 34301-02*	DATE: 8-11-98
	DRAWN BY: PNG	APPROVED BY: RC
	PROJECT NO. D34301.02	DRAWING NO. 1

THE TWINING LABORATORIES, INC.
EST. 1898
FRESNO/MODESTO/VISALIA/BAKERSFIELD/SALINAS



TEST BORING TEST PIT SCALE: 1" = 500'

SITE PLAN WITH TEST BORING & TEST PIT LOCATIONS CORDEVALLE GOLF CLUB & HOTEL SAN MARTIN, CALIFORNIA	FILE NO.: 34301-02*	DATE: 8-11-98	THE TWINING LABORATORIES, INC. EST. 1898 FRESNO/MODESTO/VISALIA/BAKERSFIELD/SALINAS
	DRAWN BY: PNG	APPROVED BY:
	PROJECT NO. D34301.02	DRAWING NO. 2



TANK CROSS SECTION

8
20
0
APPROXIMATE SCALE IN FEET

TANK CROSS SECTION CORDEVALLE GOLF CLUB & HOTEL SAN MARTIN, CALIFORNIA	FILE NO.: 34301-02* DRAWN BY: PNG PROJECT NO. D34301.02	DATE: 8-10-98 APPROVED BY: RC DRAWING NO. 3

THE TWINING LABORATORIES, INC. EST.1898
FRESNO/MODESTO/VISALIA/BAKERSFIELD/SALINAS

APPENDIX B

LOG OF TEST BORINGS AND PITS

This appendix contains the final logs of borings. These logs represent our interpretation of the contents of the field logs and the results of the field and laboratory tests.

The boring logs and related information depict subsurface conditions only at these locations and at the particular time designated on the logs. Soil conditions at other locations may differ from conditions occurring at these test boring locations. Also, the passage of time may result in changes in the soil conditions at these test boring locations.

In addition, an explanation of the abbreviations used in the preparation of the logs and a description of the Unified Soil Classification System are provided at the end of Appendix B.

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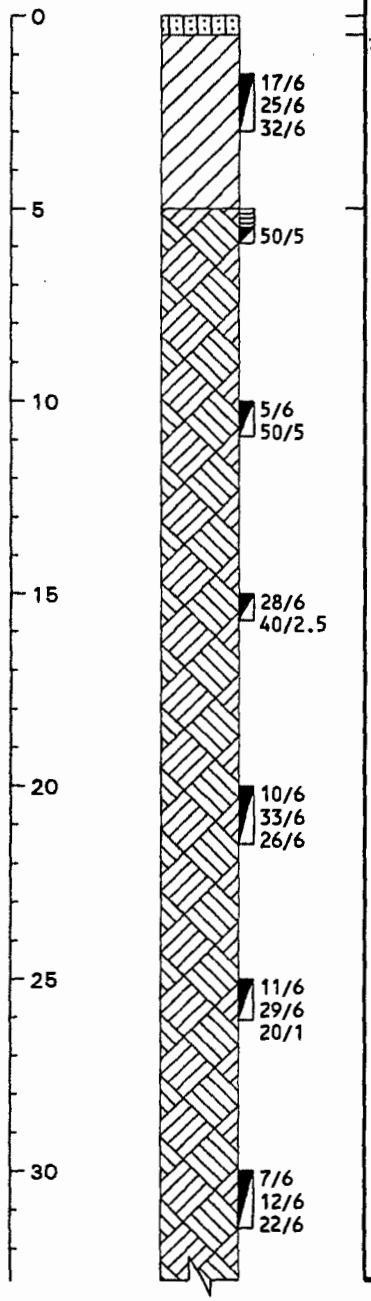
SOIL TEST BORING SYMBOLIC LOG

BORING B-1

Project: Cordevalle Potable Water Tank
Project Number: TL D34301.02A
Location: San Martin, CA
Date: 07/07/98
Logged By: M. Sekhon
Elevation: n/a
Drilled By: T. Conley
Depth to Groundwater: NE
Drill Type: CME 75
Cased to Depth: n/a
Auger Type: 6-5/8" OD HSA
Hammer Type: CME Trip



ELEVATION/ DEPTH (feet)	USCS	Soil Description	Remarks	N-value	Moisture Content %
	SM	SAND, Silty with gravels; very dense, slightly moist, fine-grained, light brown		57	2
	CL	LEAN CLAY with gravels; hard, slightly moist, low plasticity, brown			
5		gravel fraction increase		--	
			DD = 125.7 pcf ϕ = 28° c = 369 psf	>100	2
		weathered greenstone, very dense, damp, pale olive			
10				>100	4
15				>100	3
		stiffness decrease, moisture increase, gravel fraction decrease			
20				59	5
25				>100	2
30				34	

Notes: *Approximately 120 feet west of edge of tank.*

Figure Number B-1

THE TWINING LABORATORIES, INC. EST. 1898

SOIL TEST BORING SYMBOLIC LOG

BORING B-1

Project: Cordevalle Potable Water Tank
Project Number: TL D34301.02A
Location: San Martin, CA
Date: 07/07/98
Logged By: M. Sekhon
Elevation: n/a
Drilled By: T. Conley
Depth to Groundwater: NE
Drill Type: CME 75
Cased to Depth: n/a
Auger Type: 6-5/8" OD HSA
Hammer Type: CME Trip

ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-value	Moisture Content %
35	50/5		water content increase, wet soil		>100	
40	24/6 30/6 46/6				76	
			Bottom of Boring			
45						
50						
55						
60						
65						

Notes: *Approximately 120 feet west of edge of tank.*

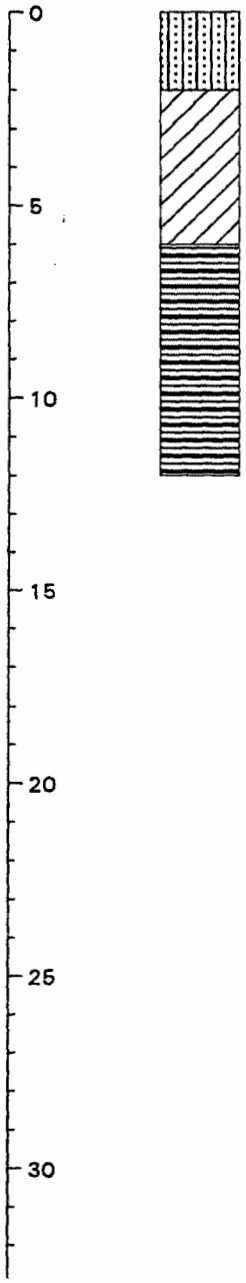
Figure Number B-1

THE TWINING LABORATORIES, INC. EST. 1898

SOIL TEST BORING SYMBOLIC LOG

BORING TP-1

Project: Cordevalle Potable Water Tank
Project Number: TL D34301.02A
Location: San Martin, CA
Date: 07/07/98
Logged By: K. Clark
Elevation: n/a
Drilled By: n/a
Depth to Groundwater: NE
Drill Type: Backhoe
Cased to Depth: n/a
Auger Type: n/a
Hammer Type: n/a



ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-value	Moisture Content %
		SM	SAND, Silty; damp, brown to yellow brown, rootlets and desication cracks			5
		CL	LEAN CLAY, Sandy; moist, coarse sand with scattered gravel, moderate plasticity, reddish brown			13
			Weathered rock, greenstone, highly weathered zones are silty clay, low plasticity, pale olive, very hard digging for backhoe at 9.5 feet below site grade			4
			Bottom of Test Pit			

Notes: *Center of proposed tank.*

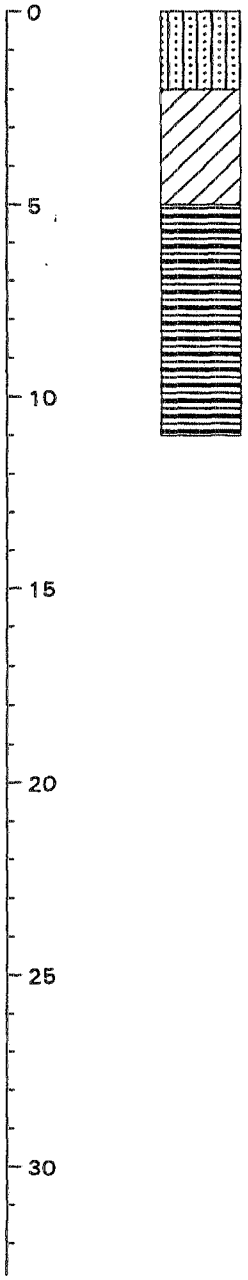
Figure Number B-2

THE TWINING LABORATORIES, INC. EST. 1898

SOIL TEST BORING SYMBOLIC LOG

BORING TP-2

Project: Cordevalle Potable Water Tank
Project Number: TL D34301.02A
Location: San Martin, CA
Date: 07/07/98
Logged By: K. Clark
Elevation: n/a
Drilled By: n/a
Depth to Groundwater: NE
Drill Type: Backhoe
Cased to Depth: n/a
Auger Type: n/a
Hammer Type: n/a

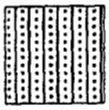


ELEVATION/ DEPTH (feet)	SOIL SYMBOLS SAMPLER SYMBOLS AND FIELD TEST DATA	USCS	Soil Description	Remarks	N-value	Moisture Content %
		SM	SAND, Silty; damp, yellow brown, fine sand with some gravel, roots and desication cracks			
		CL	LEAN CLAY, gravelly; moist, reddish brown			
			Weathered rock, greenstone, highly weathered zones are silty clay, low plasticity, pale olive, hard digging with backhoe at 6' below site grade			
			Bottom of Test Pit			

Notes: *75 feet east of center of proposed tank location.*

Figure Number B-3

KEY TO SYMBOLS

Symbol	Description	Symbol	Description
Strata symbols			
	SAND, Silty (SM)		California Modified split barrel ring sampler
	LEAN CLAY (CL)		
	Basalt (or generic rock)		
	Weathered Rock		
Misc. Symbols			
	Boring continues		
Soil Samplers			
	Standard penetration test		

Notes:

1. Test borings were drilled on 07/07/98 using a Backhoe equipped with n/a.
2. Groundwater was not encountered during drilling operations.
3. Boring locations were located by measuring wheel with reference to .
4. These logs are subject to the limitations, conclusions, and recommendations in this report.
5. Results of tests conducted on samples recovered are reported on the logs. Abbreviations used are:

DD	= Natural dry density	LL	= Liquid limit (%)
UC	= Unconfined compression (psf)	PI	= Plasticity index (%)
-4	= Percent passing #4 sieve (%)	pH	= Soil pH
-200	= Percent passing #200 sieve (%)	SS	= Soluble sulfates (%)
SR	= Soil resistivity (ohm-cm)	Cl	= Soluble chlorides (%)
c	= Cohesion (psf)	ϕ	= Angle of internal friction (degrees)
TS	= Field Torvane Shear Strength test (tsf)	NE	= None Encountered
ND	= None Detected		

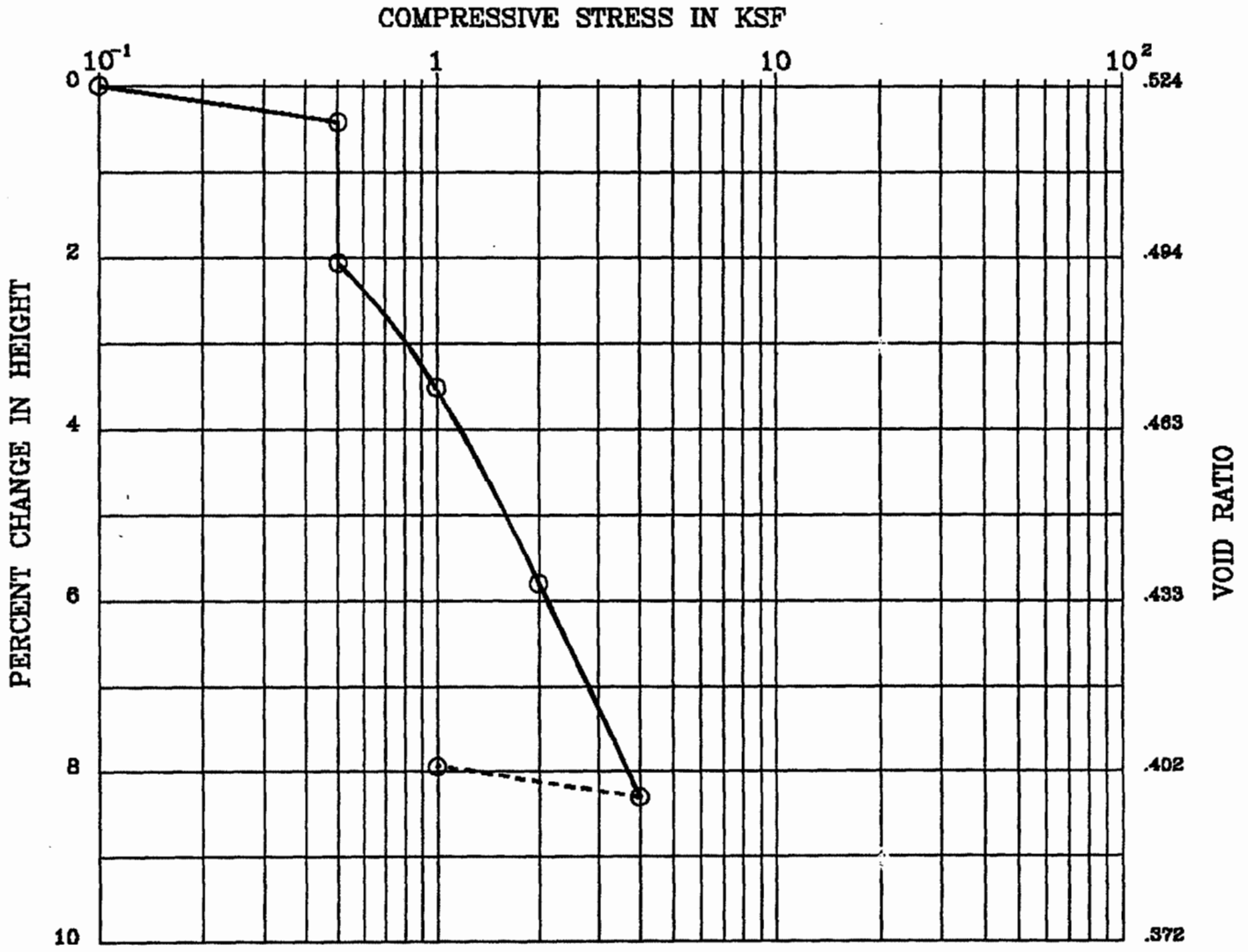
APPENDIX C

RESULTS OF LABORATORY TESTS

This appendix contains the individual results of the following tests. The results of the moisture content and dry density tests are included on the test boring logs in Appendix B. These data, along with the field observations, were used to prepare the final test boring logs in Appendix B.

These Included:	Number of Tests:	To Determine:
Natural Moisture (ASTM D2216)	9	Moisture contents representative of field conditions at the time the sample was taken.
Natural Density (ASTM D2216)	1	Dry unit weight of sample representative of in-situ or in-place undisturbed condition.
Direct Shear (ASTM D3080)	1	Soil shearing strength under varying loads and/or moisture conditions.
Consolidation (ASTM D2435)	1	The amount and rate at which a soil sample compresses when loaded, and the influence of saturation on its behavior.
Moisture-Density Relationship (ASTM D1557)	1	The optimum (best) moisture content for compacting soil and the maximum dry unit weight (density) for a given compactive effort.

These Included:	Number of Tests:	To Determine:
Sulfate Content (ASTM D4327)	1	Percentage of water-soluble sulfate as (SO_4) in soil samples. Used as an indication of the relative degree of sulfate attack on concrete and for selecting the cement type.
Chloride Content (ASTM D4327)	1	Percentage of soluble chloride in soil. Used to evaluate the potential attack on encased reinforcing steel.
Resistivity (ASTM D1125)	1	The potential of the soil to corrode metal.
pH (ASTM D4972)	1	The acidity or alkalinity of subgrade material.



BORING	: B-1	DESCRIPTION	:
DEPTH (ft)	: 5.0-5.5	LIQUID LIMIT	:
SPEC. GRAVITY	: 2.73	PLASTIC LIMIT	:

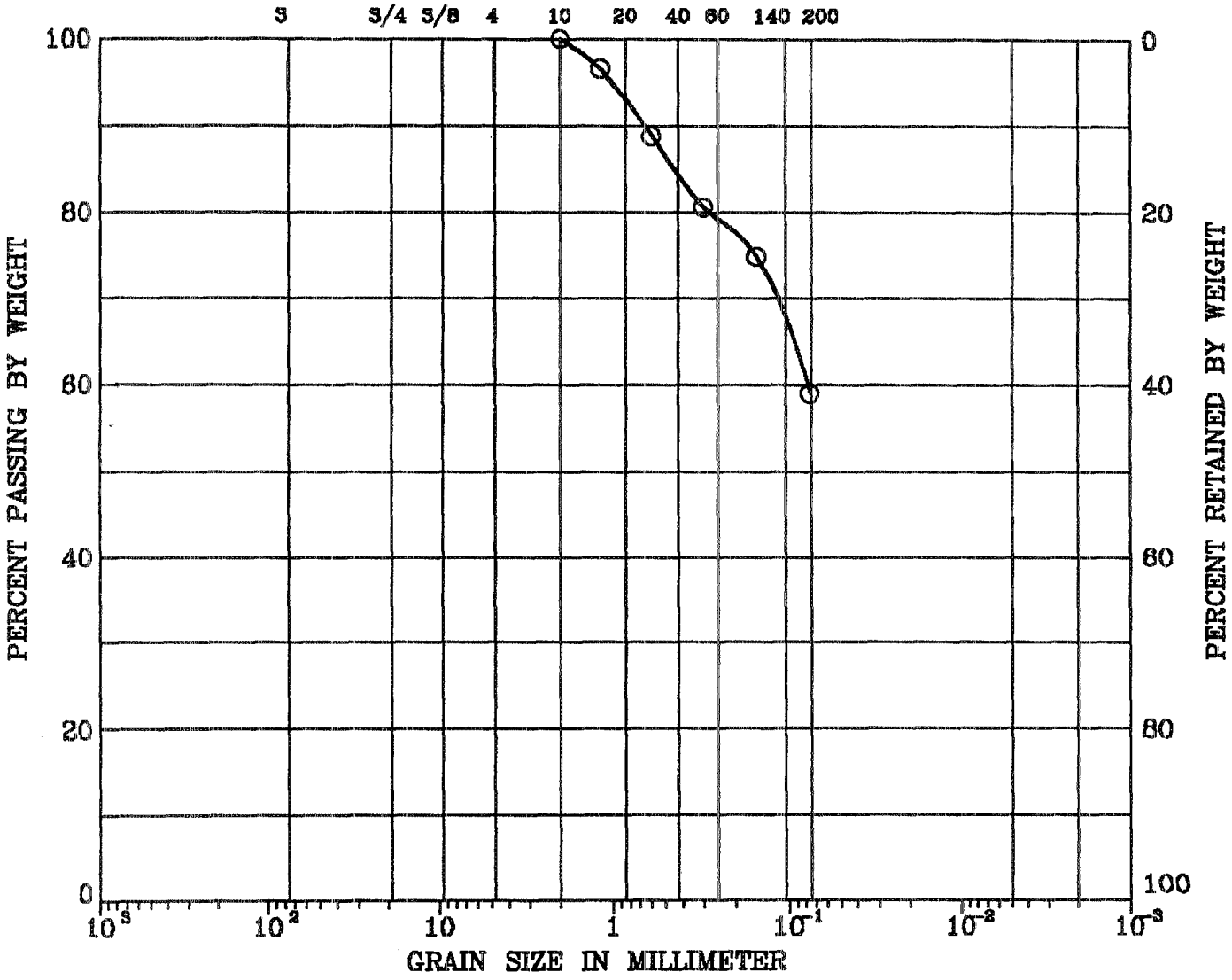
	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	PERCENT SATURATION	VOID RATIO
INITIAL	12.7	110.7	64	.524
FINAL	15.3	120.2	100	.404

Remark : TEST METHOD: ASTM D2435 MOISTURE INCREASE AT 0.5 KSF

D34301.02	PROPOSED WATERTANK
The Twining Labs Inc. Fresno, CA	CONSOLIDATION TEST Figure No. 1

UNIFIED SOIL CLASSIFICATION

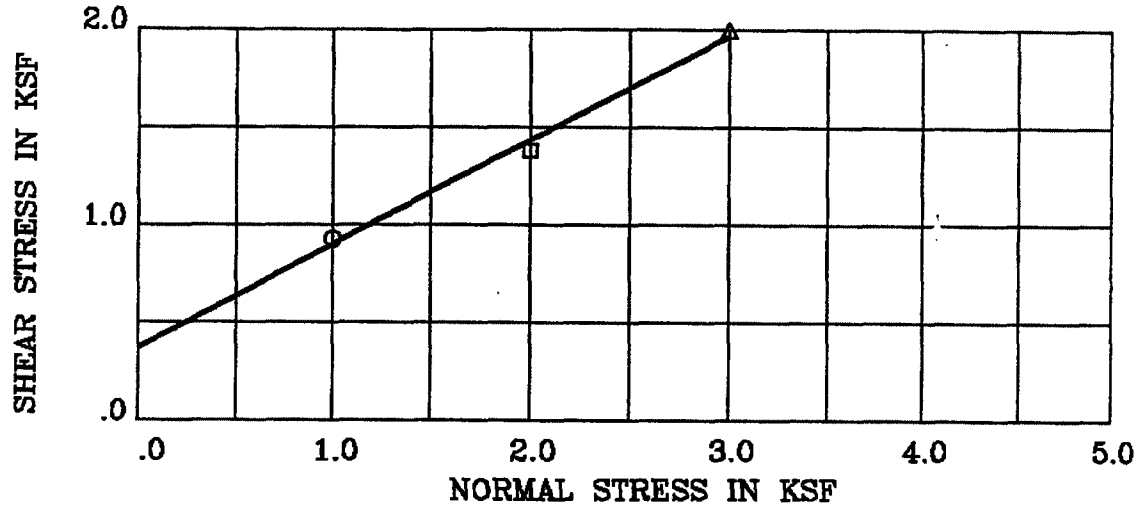
COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	
U.S. SIEVE SIZE IN INCHES			U.S. STANDARD SIEVE No.			HYDROMETER

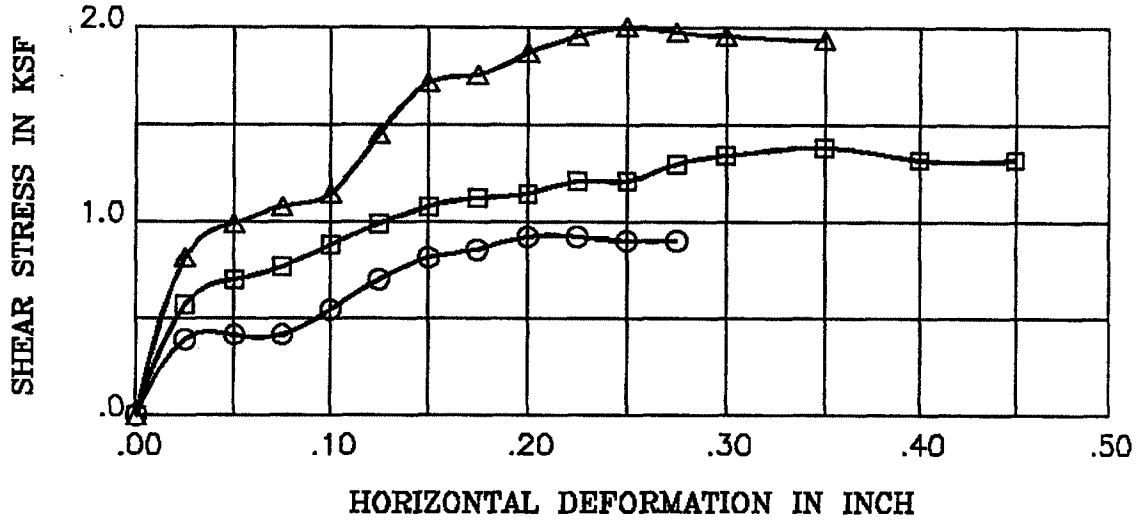


SYMBOL	BORING	DEPTH (ft)	LL (%)	PI (%)	DESCRIPTION
O	TP-1	4.0-5.3			SILT, Sandy (ML)

Remark : TEST METHOD: ASTM D422

D34301.02	PROPOSED WATERTANK
The Twining Labs Inc. Fresno, CA	GRAIN SIZE DISTRIBUTION Figure No. 2





BORING/SAMPLE : B-1 DEPTH (ft) : 5-5.5

DESCRIPTION :

STRENGTH INTERCEPT (C) : .369 KSF

FRICTION ANGLE (PHI) : 28.1 DEG

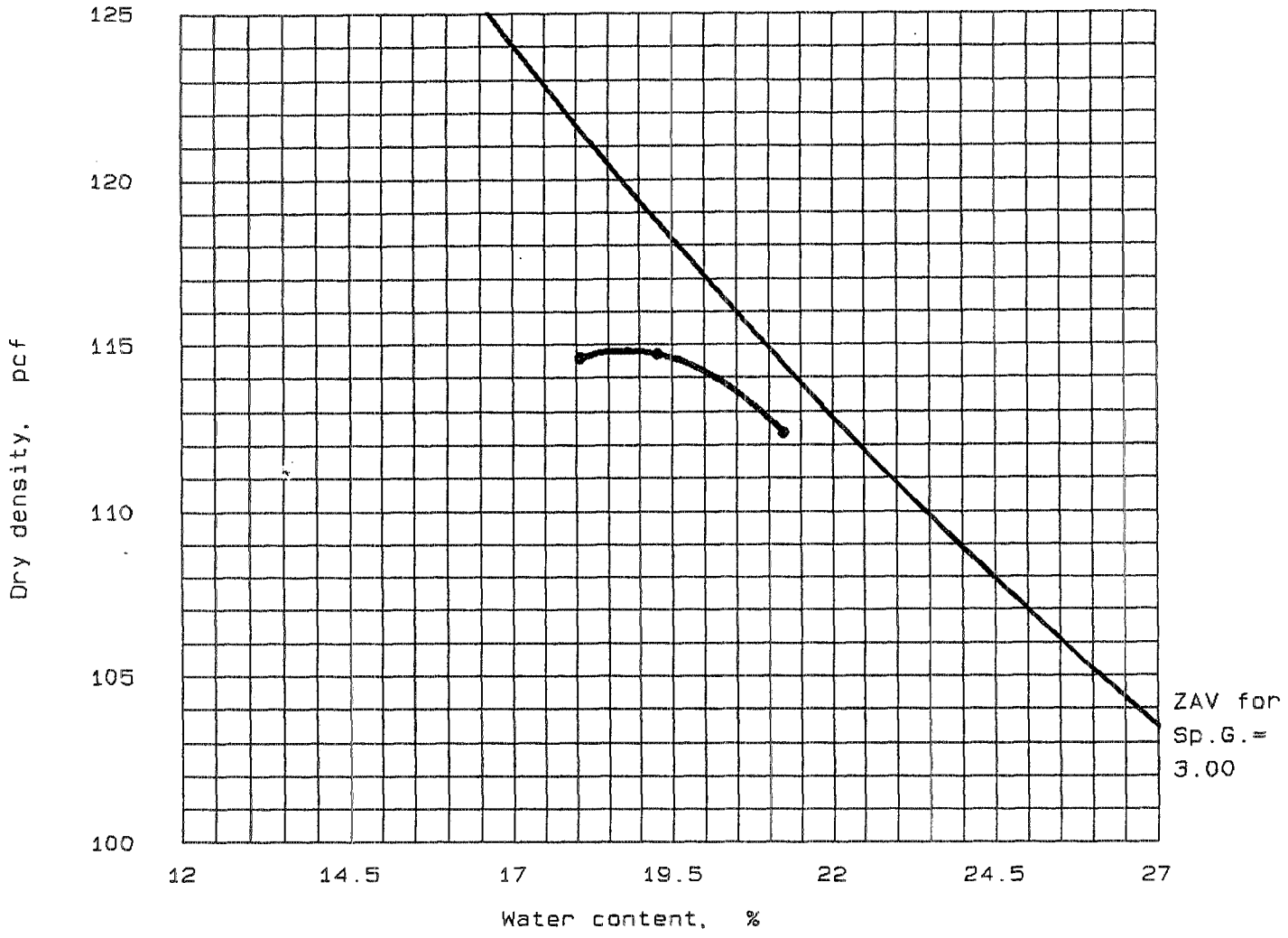
(PEAK STRENGTH)

SYMBOL	MOISTURE CONTENT (%)	DRY DENSITY (pcf)	VOID RATIO	NORMAL STRESS (ksf)	PEAK SHEAR (ksf)	RESIDUAL SHEAR (ksf)
○	28.7	103.6	.626	1.00	.93	.90
□	30.8	104.6	.611	2.00	1.38	1.31
△	31.2	102.3	.647	3.00	2.00	1.93

Remark : TEST METHOD: ASTM D3080

D34301.02	PROPOSED WATERTANK
The Twining Labs Inc. Fresno, CA	DIRECT SHEAR TEST Figure No. 3

PROCTOR TEST REPORT



"Modified" Proctor, ASTM D 1557, Method A

Elev/ Depth	Classification USCS	Classification AASHTO	Nat. Moist.	Sp.G.	LL	PI	% > No.4	% < No.200
2-6.0				2.70				

TEST RESULTS	MATERIAL DESCRIPTION
Optimum moisture = 18.8 % Maximum dry density = 114.8 pcf	CLAY

Project No.: D34301.02
Project: PROPOSED WATERTANK
Location: TP-1
SAN MARTIN, CALIFORNIA
Date: AUGUST 6, 1998

Remarks:

PROCTOR TEST REPORT

THE TWINING LABORATORIES, INC.

Figure No. 4

APPENDIX F

Biological Report

Prepared by

H.T. Harvey & Associates

May 1998

H.T. HARVEY & ASSOCIATES
ECOLOGICAL CONSULTANTS

29 May 1998

Mr. Bert Verrips
Nolte and Associates, Inc.
1 N. First Street, Suite 450
San Jose, CA 95113
voice: 510.652.1666
facsimile: 510.547.6677

SUBJECT: Hayes Valley (Lions Gate): reconnaissance-level biotic constraints survey

Dear Mr. Verrips:

We have finished our reconnaissance-level field survey of the project modification areas. Two specific areas were surveyed, including: (1) the newly-proposed location of the water tank/access road, and; (2) winery site. The purpose of our survey was to determine if these proposed changes to the original project resulted in significant impacts to biotic resources on site. Survey personnel included Dr. Patrick Boursier, plant ecologist. A detailed project description and field review of each location was supplied by Mr. Ron Davis. Both of these two sites occur within the project boundaries intensively surveyed by H. T. Harvey & Associates staff in 1994-95 in preparation of our report entitled *Hayes Valley, Biological Resources Report* (30 Nov 95; PN 385-11). Each of the project modification sites are discussed below.

1. Water Tank/Access Road: The water tank/access road complex occurs within a habitat identified in our 1995 report as non-native annual grassland, and valley oak woodland. The access road will utilize a currently-existing, unimproved dirt road. The access road will cross a single seasonal drainage channel with an existing culverted crossing. The road and crossing will be upgraded to handle increased traffic and may result in relatively minor impacts to seasonal wetland habitats within the drainage (on the order of 10-25 square feet). It is our understanding that the steep portion of the existing road will remain as dirt or gravel during and after construction, some minor tree trimming of lower branches may be necessary to create a greater clearance for construction vehicles, no trees will be removed, and the only impact will include relatively minor loss of non-native annual grassland associated with the footprint of the proposed water tank. This proposed modification will not result in any additional direct or indirect impacts to biotic resources.
2. Winery Site: The winery site which includes a wine processing facility and minor planting of vineyards for aesthetic purposes occurs within the non-native annual grassland habitat. Our understanding is that no trees will be removed and

construction will not result in any additional impacts to wetland habitats. This proposed modification will not result in any additional direct or indirect impacts to biotic resources.

In summary, the proposed modifications discussed above will not result in significant impacts to existing biological resources, beyond those already identified and addressed in the approved Environmental Impact Report.

If you our your staff have any questions please feel free to contact me or Rick Hopkins.

Sincerely,

Patrick J. Boursier, Ph.D.
Division Head, Botany and Wetlands

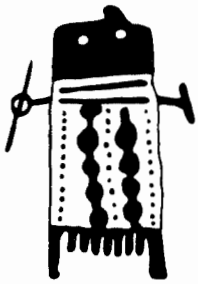
APPENDIX G

Archaeological Report

Prepared by

Basin Research Associates

May 1998



29 May, 1998

BASIN
RESEARCH
ASSOCIATES

1933 DAVIS STREET
SUITE 210
SAN LEANDRO, CA 94577
VOICE (510) 430-8441
FAX (510) 430-8443

Mr. Bert Verrips
Nolte and Associates
1 North First Street
Suite 450
San Jose, CA 95113

RE: Review of Previous Cultural Resources Studies
Proposed Location of Water Tank and Winery
Lions Gate/Cordevalle Project, Santa Clara County

Dear Mr. Verrips,

Please let this letter serve as our review of the proposed location changes for the Water Tank and Winery for the above project.

As you are aware, the project is situated in an area which has undergone a number of archival reviews and archaeological inventories as a result of cultural resource compliance requirements. Four archaeological sites, CA-SCl-76, SCl-77, SCl-305/H and SCl-568 have been recorded within the boundaries of the proposed project although only one prehistoric site, CA-SCl-76, was relocated during the various field programs. This site was also the subject of a presence/absence testing program to determine its horizontal and vertical extent [Fig. 1]. The three other reported sites for the project area, CA-SCl-77, SCl-305/H and SCl-568, did not have any visible surface indicators of a prehistoric occupation at their recorded location nor did auger testing expose the presence of subsurface cultural materials at their reported locations.

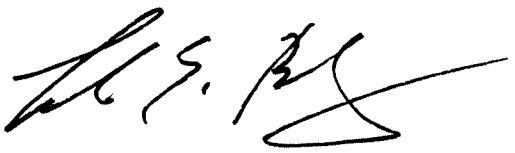
A review of the archival material on file at our office for the project indicates that none of the planned changes for the location of the Water Tank and Winery will affect any known cultural resources. Both locations are within areas that were previously subject to an archaeological inventory with negative results.

It is Basin Research Associates' considered opinion that the construction planned for the project can proceed as planned. No further archaeological research appears necessary and monitoring during subsurface construction at either the Water Tank or Winery does not appear warranted. It is recommended that if any unanticipated prehistoric or significant historic era cultural materials are exposed during construction, operations should stop within 20 feet of the find and a qualified professional archaeologist contacted for evaluation and further recommendations. Potential recommendations could include evaluation, collection, recordation, analysis, etc. of any significant cultural materials followed by a professional report.[1]

1. Significant prehistoric cultural resources are defined as human burials, features or other clusterings of finds made, modified or used by Native American peoples in the past. The prehistoric and protohistoric indicators of prior cultural occupation by Native Americans include artifacts and human bone, as well as soil discoloration, shell, animal bone, sandstone cobbles, ashy areas, and baked or vitrified clays. Prehistoric materials may

If I can provide any additional information or be of further service please don't hesitate to contact me.

Sincerely yours,
BASIN RESEARCH ASSOCIATES, INC.



Colin I. Busby
Principal

CIB/dg

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include:

a. Human bone - either isolated or intact burials.
b. Habitation (occupation or ceremonial structures as interpreted from rock rings/features, distinct ground depressions, differences in compaction (e.g., house floors).
c. Artifacts including chipped stone objects such as projectile points and bifaces; groundstone artifacts such as manos, metates, mortars, pestles, grinding stones, pitted hammerstones; and, shell and bone artifacts including ornaments and beads.
d. Various features and samples including hearths (fire-cracked rock; baked and vitrified clay), artifact caches, faunal and shellfish remains (which permit dietary reconstruction), distinctive changes in soil stratigraphy indicative of prehistoric activities.
e. Isolated artifacts

Historic cultural materials may include finds from the late 19th through early 20th centuries. Objects and features associated with the Historic Period can include.

a. Structural remains or portions of foundations (bricks, cobbles/boulders, stacked field stone, postholes, etc.).
b. Trash pits, privies, wells and associated artifacts.
c. Isolated artifacts or isolated clusters of manufactured artifacts (e.g., glass bottles, metal cans, manufactured wood items, etc.).
d. Human remains.

In addition, cultural materials including both artifacts and structures that can be attributed to Hispanic, Asian and other ethnic or racial groups are potentially significant. Such features or clusters of artifacts and samples include remains of structures, trash pits, and privies.

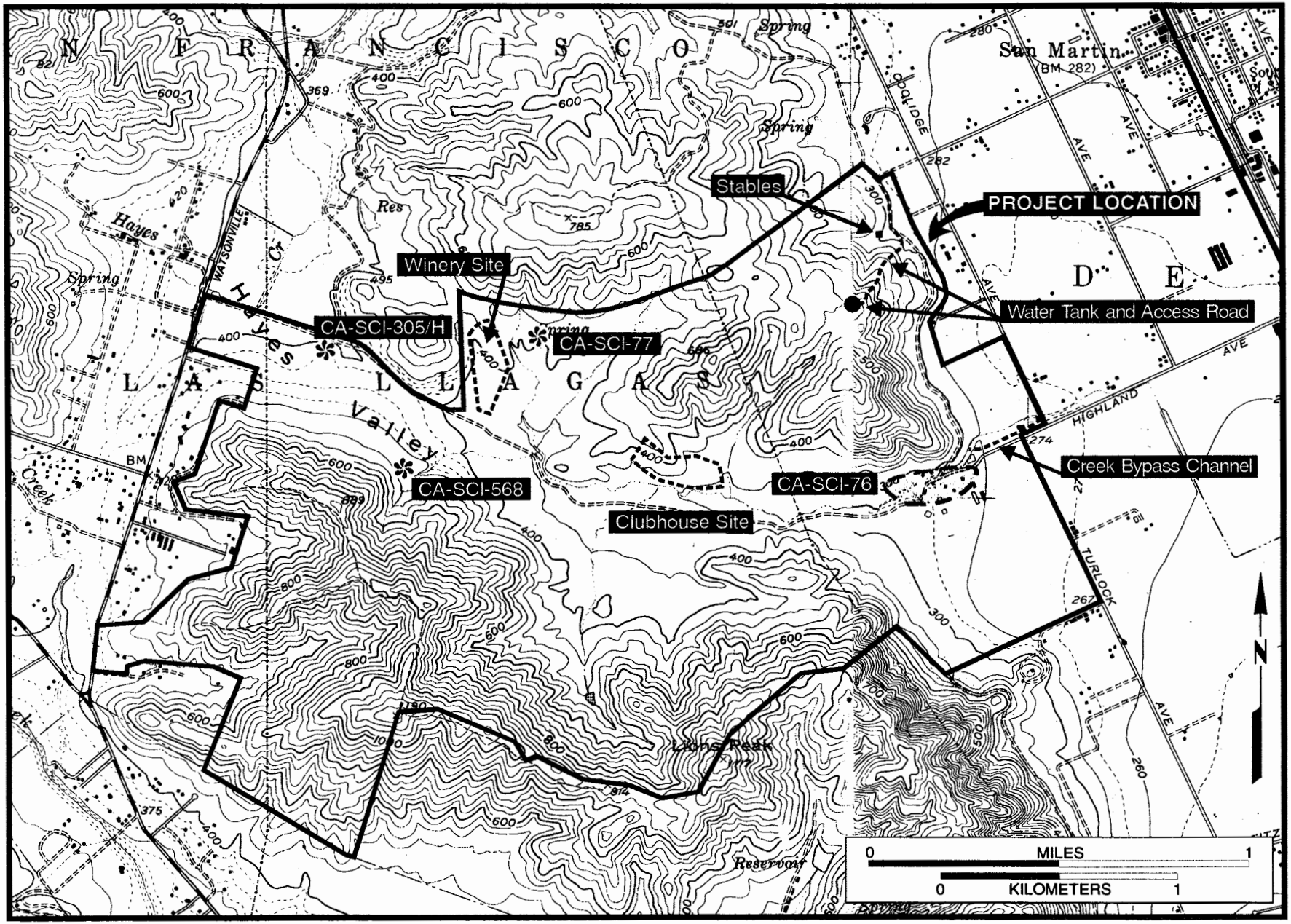


Figure 1: Project Location with Archaeological Sites and Planned Changes (USGS Mt. Madonna, Calif. 1980 and Gilroy, Calif. 1981)

TREE MITIGATION TABLE

THE FOLLOWING SPECIES/QUANTITIES OF TREES HAVE BEEN INSTALLED WITHIN THE GOLF COURSE AREA:

SPECIES	SIZE	QUANTITY
QUERCUS AGRIFOLIA	72"	2
	84"	9
	96"	3
	108"	6
	36"	6
QUERCUS RUBRUM		113
PLATANUS SPP.		65
SALIX SPECIES		50
QUERCUS AGRIFOLIA	15GAL.	250
QUERCUS LOBATA	15GAL.	150

WETLAND MITIGATION TABLE

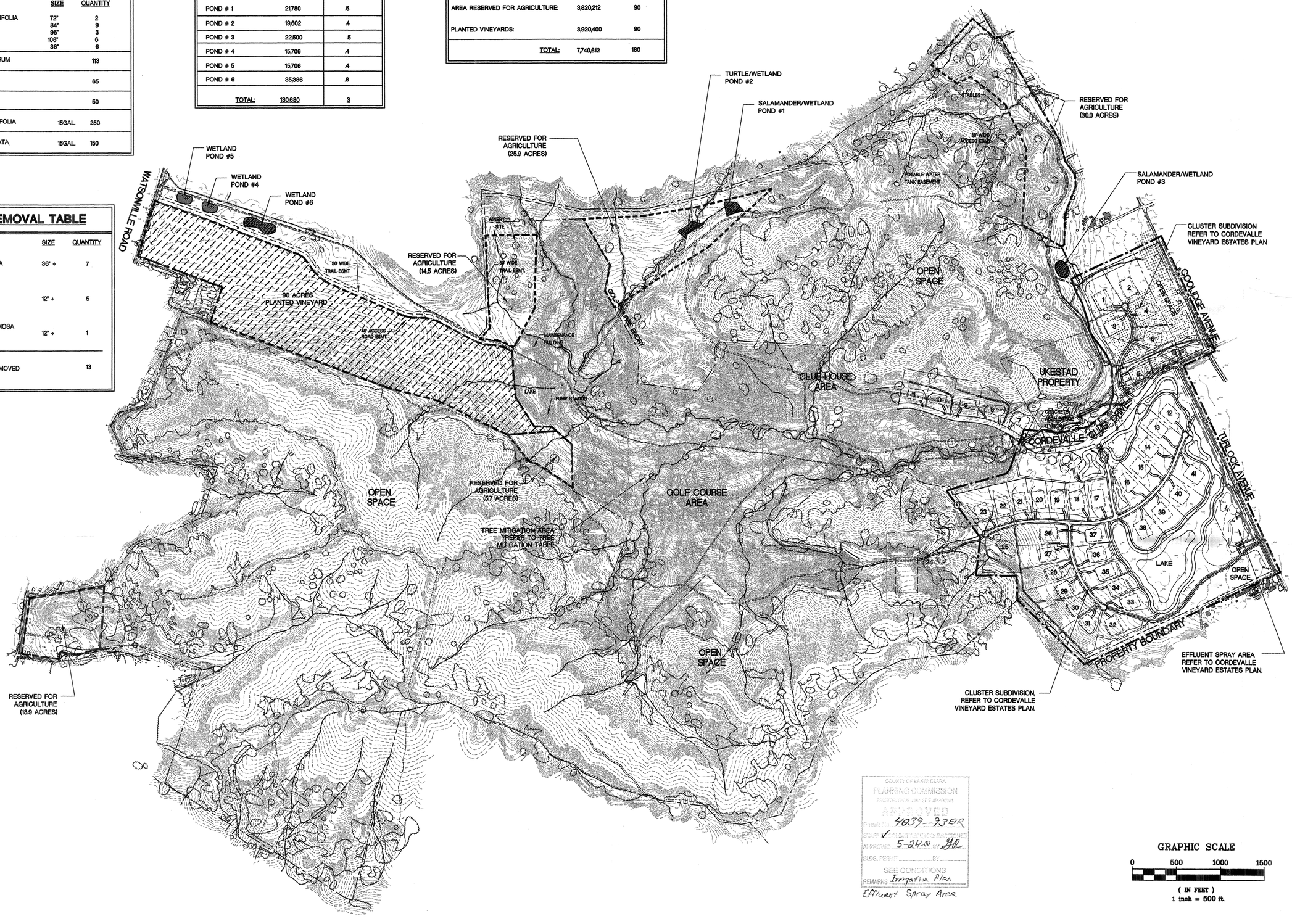
POND	AREA (SQ. SF.)	AREA (ACRE)
POND # 1	21,780	.5
POND # 2	19,602	.4
POND # 3	22,500	.5
POND # 4	15,706	.4
POND # 5	15,706	.4
POND # 6	35,386	.8
TOTAL:	130,680	3

AGRICULTURE MITIGATION TABLE

DESCRIPTION	AREA (SQ. SF.)	AREA (ACRE)
AREA RESERVED FOR AGRICULTURE:	3,820,212	90
PLANTED VINEYARDS:	3,920,400	90
TOTAL:	7,740,612	180

TREE REMOVAL TABLE

SPECIES	SIZE	QUANTITY
QUERCUS LOBATA (VALLEY OAK)	36" +	7
SALIX SPP. (WILLOW)	12" +	5
PLATANUS RACEMOSA (SYACMORE)	12" +	1
TOTAL TREES REMOVED		13



COUNTY OF SANTA CLARA
PLANNING COMMISSION
ARCHITECTURAL AND SITE APPROVAL
APPROVED
PERMIT NO. 4039--PJER
STAFF ✓ CONDITIONS COMPLIED
APPROVED 5-24-00 BY JR
BLDG. PERMIT ____ BY ____
SEE CONDITIONS
REMARKS Irrigation Plan
Effluent Spray Area

GRAPHIC SCALE

0 500 1000 1500

(IN FEET)
1 inch = 500 ft.

RIPLEY DESIGN GROUP

Landscape Architecture
Land Planning

1614 Mt. Diablo Boulevard
Walnut Creek
California 94596
Tel 925.938.7377
Fax 925.938.7436

DEVELOPER:

CORDEVALLE VINEYARD ESTATES L.L.C

2001 WINWARD WAY,
SUITE 200
SAN MATEO, CA
94404

TEL. 650.377.0300
FAX 650.349.2442

PROJECT:

CORDEVALLE

SAN MARTIN,
CALIFORNIA

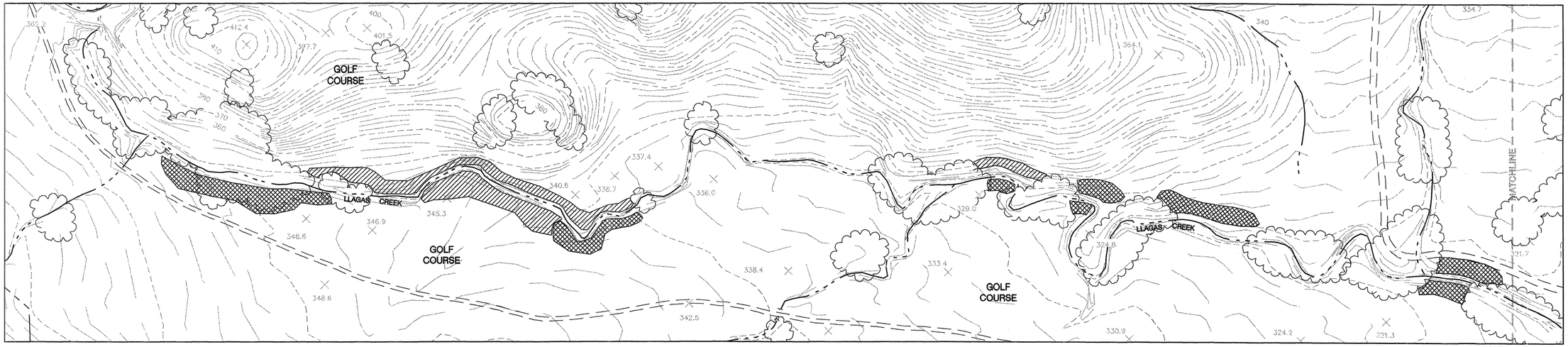
MITIGATION PLAN

LICENSED LANDSCAPE ARCHITECT
JAMES A. RIPLEY
2606
RENEWAL 2/1/2001
State of California

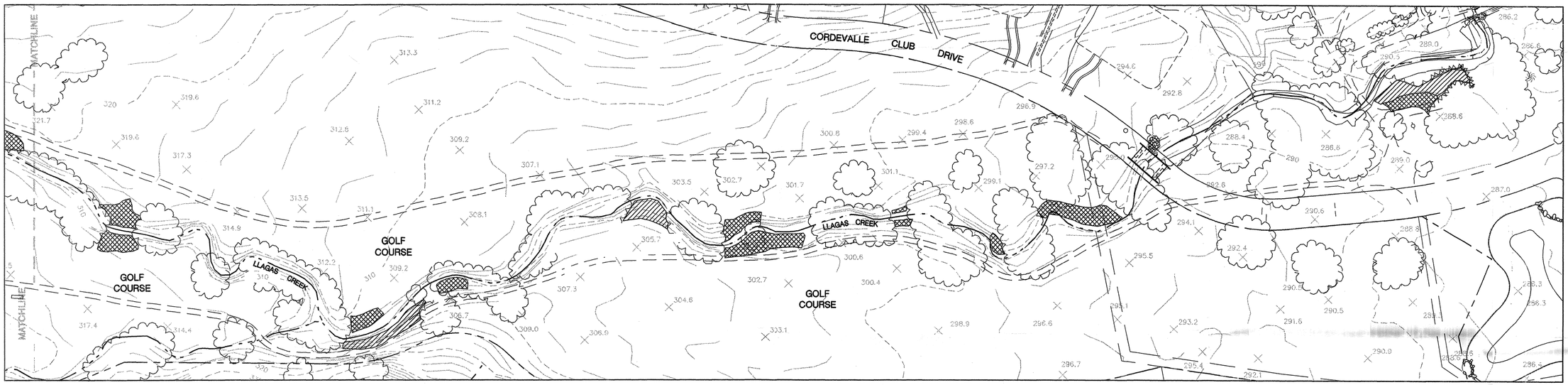
PROJECT #: 200699
DATE: April 24, 2000
SCALE: 1" = 500'-0"
DRAWN BY: GD
CHECKED BY: JR

REVISIONS:

SHEET
1
OF 1 SHEETS



WESTERN HALF



EASTERN HALF

LOCATION OF TREE AND SHRUB PLANTING AREAS

	BOTANICAL NAME	COMMON NAME	AVERAGE SPACING	PLANT SIZE
	TREES			
	PLATANUS RACEMOSA	SYACAMORE	25 FEET	CITRUS POT OR 15 GAL. CONTAINER
	QUERCUS LOBATA	VALLEY OAK	25 FEET	CITRUS POT OR 15 GAL. CONTAINER
	SHRUBS			
	BACCHARIS SALICIFOLIA	MULEFAT	5 FEET	DEEP POT OR 1 GAL. CONTAINER
	RHAMNUS CALIFORNICA	CALIFORNIA COFFEE-BERRY	5 FEET	DEEP POT OR 1 GAL. CONTAINER
	ROSA CALIFORNICA	CALIFORNIA ROSE	5 FEET	DEEP POT OR 1 GAL. CONTAINER
	RUBUS URSINUS	CALIFORNIA BLACKBERRY	5 FEET	DEEP POT OR 1 GAL. CONTAINER
	SYMPHORICARPOS ALBUS SSP.LAEVIGATUS	SNOWBERRY	5 FEET	DEEP POT OR 1 GAL. CONTAINER
	EXISTING TREES			

NOTE: ALL INFORMATION DERIVED FROM CONCEPTUAL CREEK REVEGETATION/ENHANCEMENT PLAN - LION'S GATE DEVELOPMENT PROJECT, SANTA CLARA COUNTY
BY LSA ASSOCIATES, INC.
MARCH 4, 1996

GRAPHIC SCALE
0 100 200 250
(IN FEET)
1 inch = 100 ft.

RIPLEY DESIGN GROUP
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Land Planning
1614 Mt. Diablo Boulevard
Walnut Creek
California 94596
Tel 925.938.7377
Fax 925.938.7436

DEVELOPER:

CORDEVALLE VINEYARD ESTATES L.L.C

2001 WINWARD WAY,
SUITE 200
SAN MATEO, CA
94404

TEL. 650.377.0300
FAX 650.349.2442

PROJECT:

CORDEVALLE

SAN MARTIN,
CALIFORNIA

LLAGAS CREEK RIPARIAN HABITAT RESTORATION & ENHANCEMENT PLAN

LICENSED LANDSCAPE ARCHITECT
JAMES A. RIPLEY
No. 2996
EXPIRATION DATE 8-31-2000
State of California

PROJECT #: 200699
DATE: April 24, 2000
SCALE: 1" = 100'-0"
DRAWN BY: GD
CHECKED BY: JR

REVISIONS:

SHEET
1
OF 1 SHEETS

File 4039--97ER