

10/85

LIME RIDGE

REGIONAL RECREATIONAL AREA

MASTER PLAN
AND
RESOURCE ANALYSIS



Walnut
city of **Creek**

City of Concord

MASTERPLAN
LIME RIDGE REGIONAL RECREATION AREA

Prepared for
CITY OF WALNUT CREEK
and
THE CITY OF CONCORD

OCTOBER 1985

by

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LIME RIDGE REGIONAL RECREATION AREA
MASTER PLAN

INTRODUCTION

The Masterplan for Lime Ridge Regional Recreational Area (LRRRA) is the plan for the recreational development of the visually prominent 830-acre public open space area off Ygnacio Valley Road at the boundary between the Cities of Walnut Creek and Concord. The Masterplan includes facilities developed within LRRRA as well as on adjacent City of Walnut Creek property in the vicinity of Walnut Creek Municipal Golf Course. The plan has been prepared on the basis of a comprehensive Resource Analysis and represents the culmination of one year of careful study and planning by and joint work between the City of Walnut Creek Park and Recreation Commission; Robert Pond, the Open Space Specialist for the City of Walnut Creek; the City of Concord; special community interest groups; the public at large; and the planning consultants, LSA (Environmental Consultants) and Inouye Associates (Landscape Architects).

The Resource Analysis is a comprehensive study of the existing natural and manmade resources and features. It includes statements of current City of Walnut Creek planning policies and guidelines as they apply to LRRRA and concludes with a statement of the constraints to and opportunities for recreational use of the area. These site and policy constraints and opportunities have served as the guidelines for the development of the Masterplan. The Resource Analysis is attached to this Masterplan as Appendix A. The Masterplan is a written summary and a graphic illustration of both the Resource Analysis and the planning effort.

Site Description

The LRRRA includes 830 acres of which 630 acres occur in the City of Walnut and 200 acres occur in the City of Concord (Figure 1). It is also divided into two parcels by Ygnacio Valley Road. Approximately 80 acres of LRRRA occur north of the road and approximately 750 acres south of it.

The prominent ridge, Lime Ridge, runs north-south through LRRRA, dividing it into two distinct topographic units. Three fourths of LRRRA possesses a

westerly exposure and one-fourth possesses an easterly exposure. A series of minor ridges run east and west on the west side of the major Lime Ridge spine. The highest point on the site is approximately 970 feet above sea level and the lowest elevation is approximately 170 feet above sea level, the result being a significant vertical difference of 800 feet across the site.

The site is characterized by steep terrain. Aside from the existing roads and trails, only 27 acres or 3.3 percent of the 830 acres is 15 percent or less in slope. These areas of 15 percent slope or less occur in small areas ranging from approximately 0.1 acres to 2 acres in size in 23 scattered locations. These areas were studied as potential sites for specific recreational activities and/or facilities. The larger of these areas have been created by quarrying operations and are more closely flat. It is these quarrying operations and access roads that have caused the most prominent visual manmade impact on LRRRA.

Park and Recreation Commission and Public Input

Through several public meetings chaired by the City of Walnut Creek Park and Recreation Commission and a number of study sessions with Walnut Creek and Concord staff and the Walnut Creek Open Space Foundation, numerous recreational use and facility options for the LRRRA were mentioned and explored. These options ranged from high-use and high-facility development to low-use, minimal-facility development. The uses and facilities were:

High-Intensity Uses and Facilities

Nine-hole golf course

Golden Gate Park-like areas

Regional Recreational Facility, including building structures

Commercial enterprises

Parking

Environmental Education Center

Major staging areas

Amphitheater

Medium-Intensity Uses and Facilities

Overnight camping

Stables

Archery ranges

Youth camp (i.e. Boy and Girl Scouts)

Parking

Staging area

Shooting range

Shooting trails

Restrooms -- developed

Low-Intensity Uses and Facilities

Hiking

Picnicing

Horseback riding

Bicycle riding

Environmental education

Chemical or composting restrooms

Following a joint evaluation of the Resource Analysis, particularly the opportunities and constraints, and the recreational development alternatives presented at the Commission hearings and study sessions, a consensus opinion was developed by the Commission and the participants as to which of the above recreational uses and facilities were considered appropriate for inclusion in the LRRRA Masterplan.

These uses and facilities were:

Parking areas

Staging areas

Overnight camping facilities

Youth camp

Hiking trails

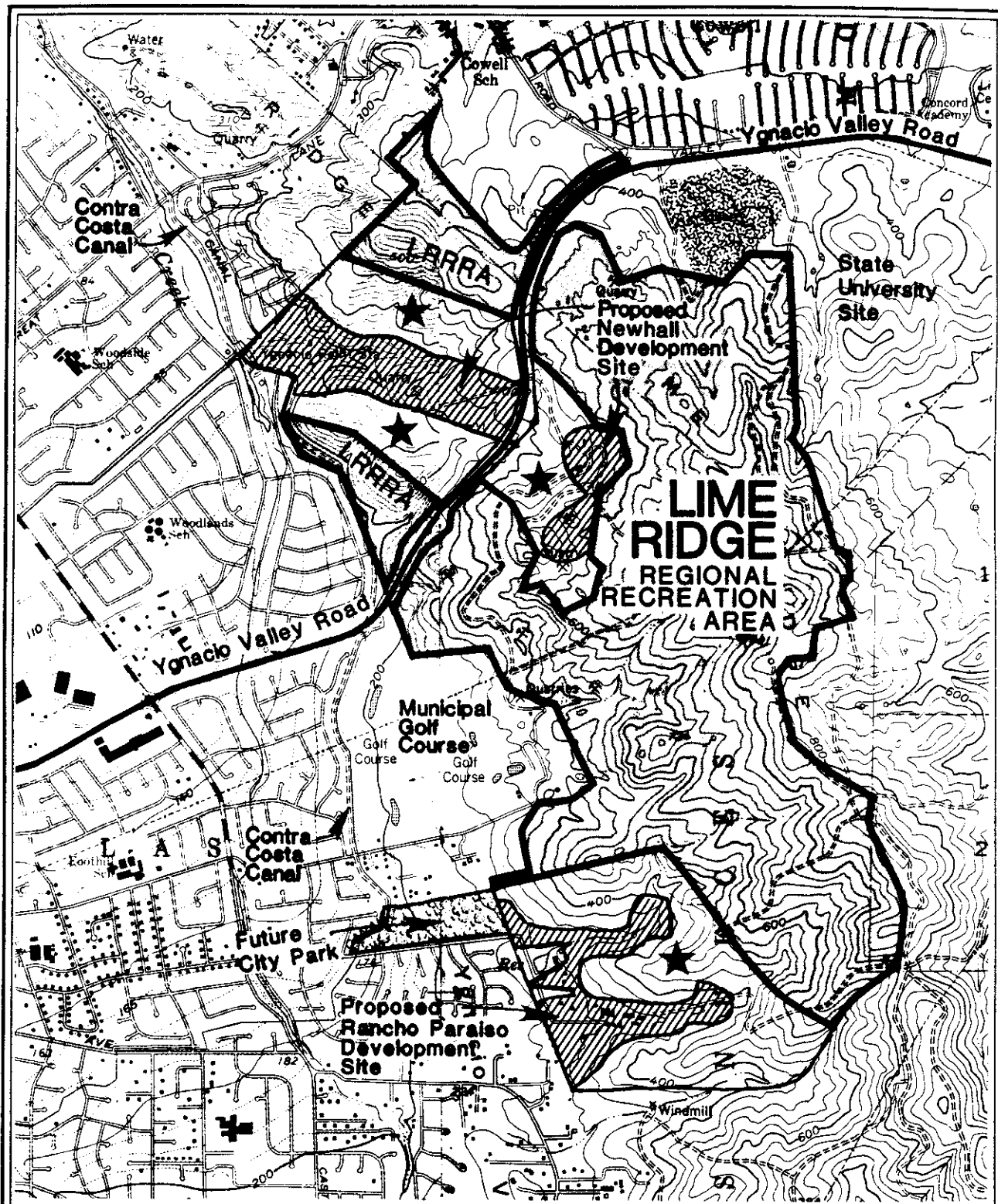
Bicycle paths (limited)

Equestrian trails

Environmental education

Chemical or composting restrooms

These recreational uses and facilities were approved and incorporated into the Masterplan.



SOURCE: U.S.G.S. 7.5 minute QUADRANGLES: WALNUT CREEK; CLAYTON



PROPOSED DEDICATED OPEN SPACE



LIME RIDGE REGIONAL RECREATION AREA

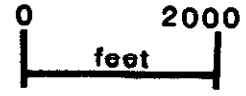


FIGURE 1.

LIME RIDGE REGIONAL RECREATION AREA BOUNDARIES

THE MASTERPLAN

The Masterplan for LRRRA consists of four major elements: Open Space Preserves, a Nature Preserve, a Trails System, and Activity Areas. These elements are diagrammed on the Masterplan (Figure 2). Each element of the Masterplan elements is described as follows.

Open Space Preserve

The greatest majority of the 830 acres or approximately 97 percent of land area shall be left as an Open Space Preserve. This land is characterized by steep slopes exposed ridges, narrow ravines, fragile soils and geology, and land altered by the quarrying operation. The vegetation mosaic includes grasslands and oak woodland but, for the most part is dense chaparral that is almost impenetrable to foot traffic.

The primary Masterplan goals within this Open Space Preserve is to retain, protect, and/or rehabilitate the natural environment. The recreational value of the Open Space Preserve is for informal passive uses including hiking, horseback riding, picnicking, and nature and history study. Specific constraints and opportunities are discussed in the Resource Analysis (Appendix A, Figure B).

Nature Preserve

Willow Quarry Nature Preserve contains a pond which has been identified in the Resource Analysis as the only natural source of water for wildlife for much of the year. The quarry also supports an association of plant species not found elsewhere on LRRRA. For these reasons, the quarry should be treated as a Nature Preserve. This area should be properly protected by a signage and fencing program and be buffered from other activities as necessary.

Trails System

A comprehensive trails system has been diagrammed for the Masterplan of the LRRRA. These trails serve several important purposes. First, they provide a trail loop and internal connection for access to the entire LRRRA, points of interest, and Activity Areas. Second, they provide access linkage to existing regional trails including the Contra Costa Canal Trail and the State Hiking and Riding Trail, and a possible future connection to the proposed Mt. Diablo Trail. Third, they provide access for maintenance, fire protection, security surveillance, and emergency use.

Trails shall be primarily unpaved and directed toward hiking and equestrian activities. Some trails will use and/or extend existing fire trails and roads developed in conjunction with previous quarrying operations. Portions of a trail may be paved because of the relatively high projected use and technical reasons. Certain existing trails and roads shall be abandoned or closed because of lack of necessity or trail duplication, safety factors, technical factors, and/or undesirable intrusion into the open space preserves.

Because of overwhelming abundance of steep terrain, bicycle trails were determined to be "less appropriate" recreational facilities in LRRRA. However, a paved bicycle trail connection has been proposed extending north and south from the Contra Contra Canal trail at the north LRRRA property line to the Walnut Creek Municipal Golf Course parking lot by way of an existing underground crossing beneath Ygnacio Valley Road in connection with new trails planned on the Newhall Northwest Parcel as part of a proposed plan for residential development.

In conjunction with trail development, other elements which need implementation include a signage program for information, trail designation, safety and interpretative programs; gate control and fencing; and technical solution for drainage, minor crossings, and the like.

Activity Areas

Potential Activity Areas were identified in the Resource Analysis on those areas of less than 15 percent slope and studied for appropriate usage. Sites were related on the basis of unique features attributed to the area, proximity, access, size and slope.

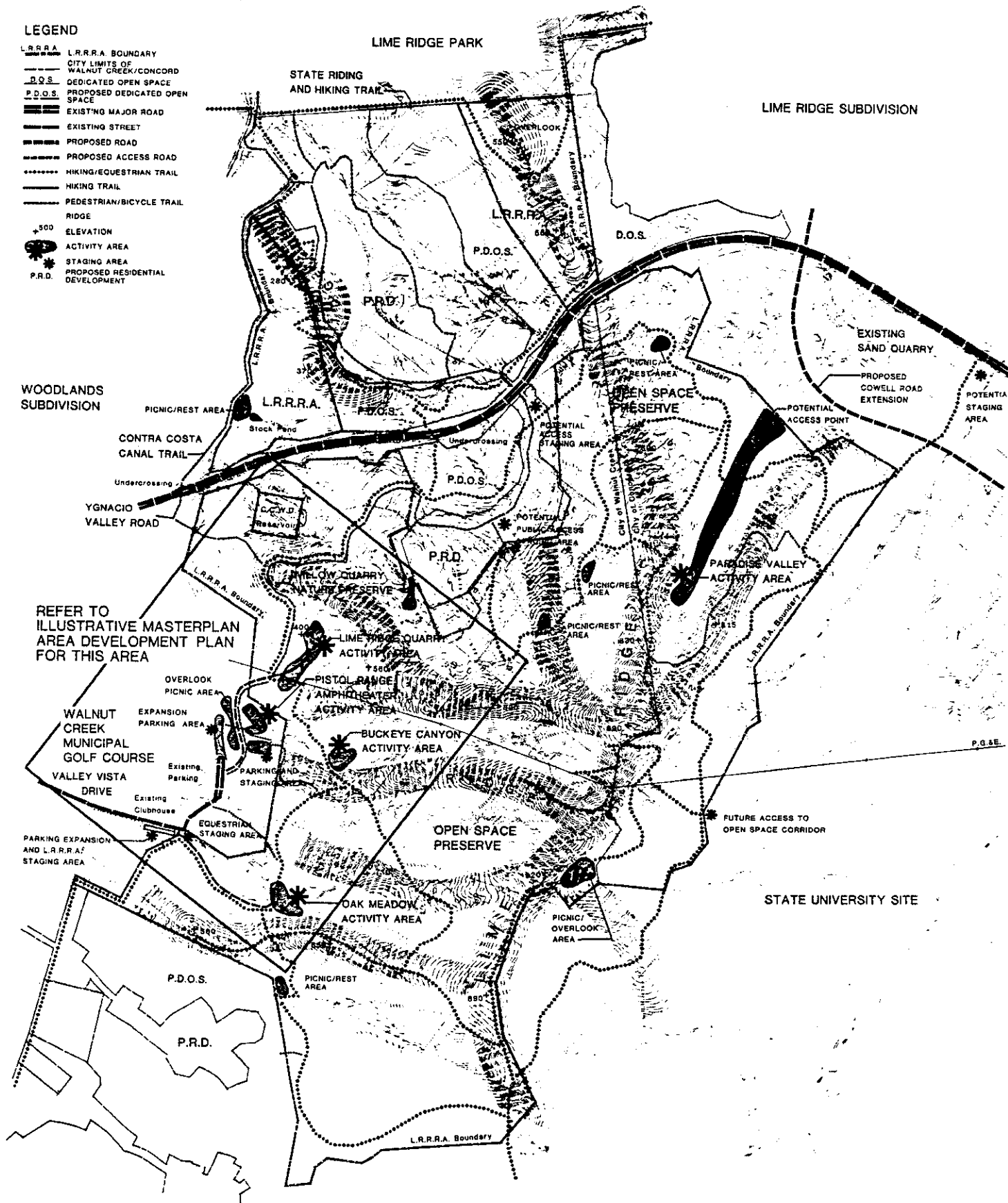
Five major sites were identified as Activity Areas, four sites occur on the westerly side of Lime Ridge in proximity to the Walnut Creek Municipal Golf Course. These areas appear on the Illustrative Masterplan Area Development Plan (Figure 3). No activity area development is proposed at this time for the fifth area (Paradise Valley).

Lime Ridge Quarry Activity Area. This two-acre base of the major abandoned quarry is a natural setting for development of a group use area. It is completely enclosed on three sides by slopes remaining from the quarry operations, creating an area that is suitable for a variety of possible activities.

Implementation could include construction of a paved road and short-term parking area through a control gate, an irrigated turf field, a drainage

LEGEND

- L.R.R.A. L.R.R.A. BOUNDARY
- CITY LIMITS OF WALNUT CREEK/CONCORD
- D.O.S. DEDICATED OPEN SPACE
- P.D.O.S. PROPOSED DEDICATED OPEN SPACE
- EXISTING MAJOR ROAD
- EXISTING STREET
- PROPOSED ROAD
- PROPOSED ACCESS ROAD
- HIKING/EQUESTRIAN TRAIL
- HIKING TRAIL
- PEDESTRIAN/BICYCLE TRAIL
- RIDGE
- +500 ELEVATION
- ACTIVITY AREA
- STAGING AREA
- P.R.D. PROPOSED RESIDENTIAL DEVELOPMENT



REFER TO ILLUSTRATIVE MASTERPLAN AREA DEVELOPMENT PLAN FOR THIS AREA

MASTERPLAN

LIME RIDGE REGIONAL RECREATIONAL AREA

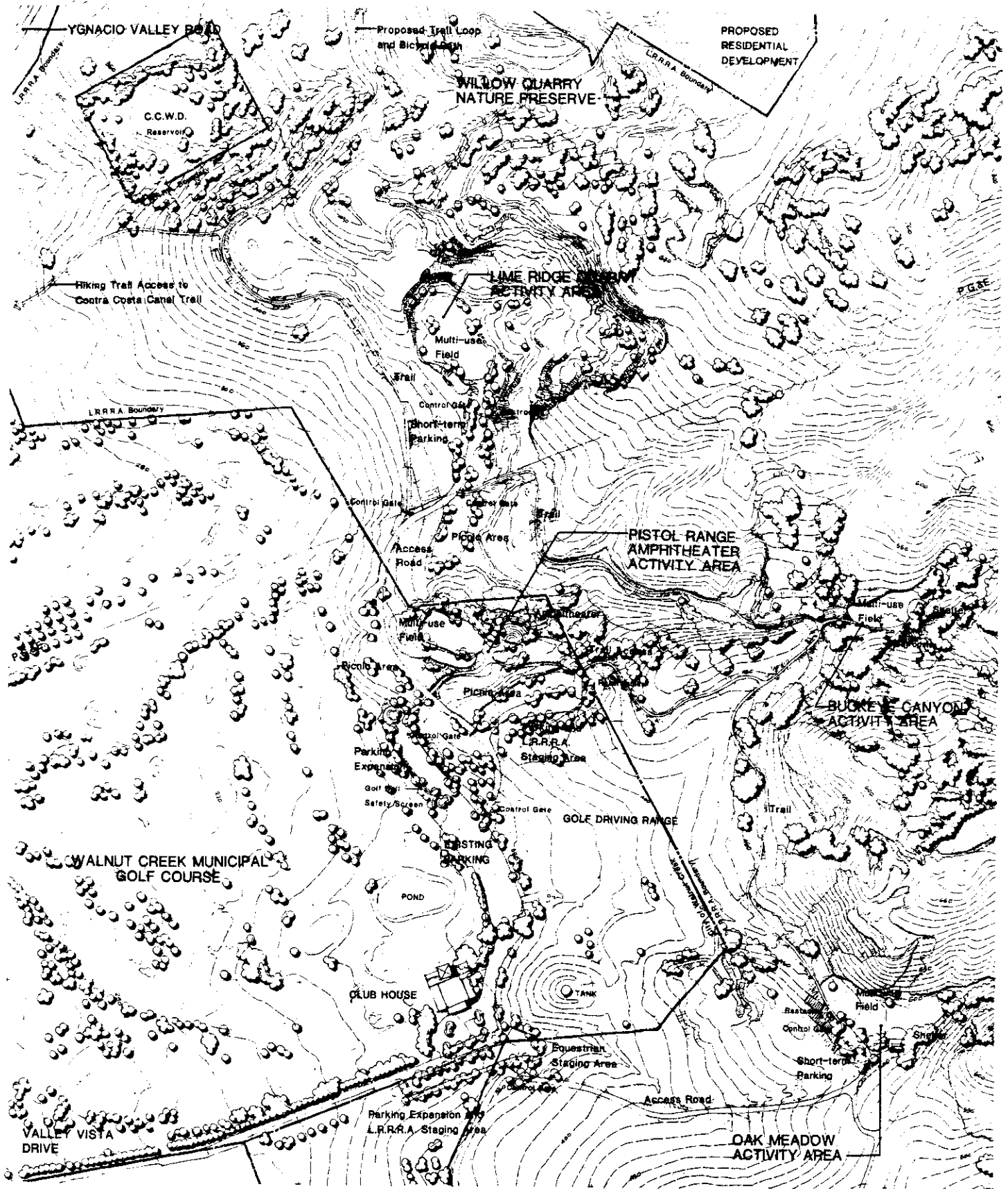
CITY OF WALNUT CREEK / CITY OF CONCORD



CONSULTANTS
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 Landscape Architects/Planners
 Berkeley, California

SHEET
 FIGURE
 2

October 1985



ILLUSTRATIVE MASTERPLAN AREA DEVELOPMENT

LIME RIDGE REGIONAL RECREATIONAL AREA

CITY OF WALNUT CREEK / CITY OF CONCORD



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SHEET
FIGURE
 3
 October 1985

solution for the quarry base, potable water, and chemical or composting restrooms. An immediately adjacent area is appropriate for the development of an overlook picnic area. A geologic study and engineering solution is required as in other areas to ensure safe use. Fencing and a safety program will also be required.

Buckeye Canyon Activity Area. Between two minor ridges is a small one-acre gently sloping area with numerous California buckeye trees. This area is on appropriate site for walk-in, small-group day and overnight use. A shelter storage enclosure and chemical or composting restrooms would provide the potential for overnight camping.

Oak Meadow Activity Area. A 1.8-acre area similar in function to Buckeye Canyon is proposed for an adjacent ravine. This larger site has a field which would provide an area for more active informal activities. Its proximity to vehicle access allows this area to be available for bringing in provisions and equipment for overnight camping by larger groups. Short-term access parking, gate control, chemical or composting restrooms, and a shelter with storage enclosure would make this facility an appropriate group camp site.

Pistol Range Amphitheater Activity Area. This area became an important addition to the comprehensive development of the LRRRA Masterplan. This site is located outside the LRRRA, but is owned by the City of Walnut Creek as part of the Municipal Golf Course.

After careful deliberation, it was determined at the Park and Recreation Commission hearings that a pistol range in this particular location is a "less appropriate land use" because of potential safety hazards. It was also determined that this area should be included within the Masterplan because of its advantages proximity and potential contribution to the recreational values of the LRRRA and the City of Walnut Creek.

It was decided that this site could be utilized for "relatively high" group use. Development of this area would include an outdoor amphitheater with seating and a stage, an irrigated turf field for informal activities, walkways and stairs, chemical or composting restrooms, parking, and access to trails.

Paradise Valley Activity Area. A fifth activity area that was included in the Masterplan is proposed for Paradise Valley. This area is in the Concord portion of the LRRRA and is characterized by an enclosed ravine of grass and oak woodland. It was decided at the Park and Recreation Commission hearings that this area would remain undeveloped at present so that the quality of this unique and picturesque environment could be retained.

Development of this area as an activity area may be considered by the City of Concord in the future.

Other Activity Areas. Additional areas designated on the Masterplan are three picnic areas and reststops. These areas are relatively flat and represent points of interest such as overlooks or a pond. Picnic tables will be provided at these locations.

Parking and Staging Areas

Five parking and staging areas are included in the LRRRA Masterplan. These are:

Parking and Staging area at the end of Valley Vista Drive. This parking and staging area would provide expansion parking for the golf course and the users of the LRRRA. Development would require, however, acquisition of private property and possible street improvements to Valley Vista Drive. A small equestrian staging and trailer parking area is located in the east side of the parking expansion area on LRRRA property.

Expanded Parking north of Walnut Creek Municipal Golf Course. Expanded parking on the north side of the existing Municipal Golf Course parking lot would provide necessary additional parking for the golf course as well as for the Pistol Range Amphitheater Activity Area and the LRRRA. Development would require additional grading and construction of a screen to protect the lot from incorrectly hit golf balls.

Pistol Range Amphitheater Activity Area Parking. This lot would provide parking for the Amphitheater Area, Lime Ridge Quarry Activity Area and the other users of LRRRA.

Parking and Staging Area on Private Land south of and adjacent to Ygnacio Valley Road. As part of any development of this private parcel of land, public access to the LRRRA should be required by the City of Walnut Creek. As part of this requirement, a public parking and staging area should be provided by the developer.

Undesignated Staging and Parking. Staging and parking are also necessary for the east side of LRRRA and should be developed in conjunction with further development of lands adjacent to the north and eastern boundaries to the City of Concord or within the LRRRA as part of the development of the Paradise Valley Activity Area.

Masterplan Development Consideration

If the private inholding south of and adjacent to Ygnacio Valley Road were included in LRRRA, additional and/or alternative facilities should be considered to take advantage of the property's physical features and location. The quarries should be considered as potential sites for group camping activities or picnic facilities. They offer the same level terrain and protection from wind as the other nearby quarries and they are adjacent to abandoned haul roads and railroad grades which provide good pedestrian and equestrian access from both the east and west. The staging area identified in the Masterplan on this parcel should be shifted to a location closer to Ygnacio Valley Road. Pedestrian and hiking trails should be retained from the Ygnacio Valley Road crossing and also be established from the alternative staging area to the trail system shown in the Masterplan. The stock watering pond should be retained as a source of water for cattle. The lime kiln should be left in its existing condition but be signed to provide historical and interpretive information and possibly be fenced to protect the resource.

IMPLEMENTATION AND PLANNING

The goal of the Masterplan is to provide long-term perspective to the development of LRRRA to be administered and funded by the City of Walnut Creek and the City of Concord over a long period of time. A geologic and engineering study should be performed to provide criteria for safe development especially as it relates to use of the quarries with their steep slopes, cliff-like edges and loose debris. Additional safety measures would involve construction of fences, proper signage, and location of trails and activity areas away from hazardous areas. Specific plans should be developed for each component area of development.

Preliminary Development Costs. Preliminary basic costs for the construction of the elements proposed as part of this Masterplan are divided into two categories, namely those basic construction costs that would be incurred in making the improvements within the current boundaries of LRRRA, and those that would be incurred in making the improvements at the Pistol Range Amphitheater Activity Area and Golf Course Parking Expansion Area/Picnic Area on the Municipal Golf Course property owned by the City of Walnut Creek. Preliminary development costs, including a summary cost statement, are provided in Appendix B to this Masterplan.

Three specific items identified by the City will require particular attention and further careful study. These include: 1) provision of water service to LRRRA, 2) solution to specific drainage problems caused by the development of the activity areas and the necessity to protect the Walnut Creek Municipal Golf Course, and 3) repair of various miscellaneous land scars and subsequent revegetation plantings (ie. the scar along the private service road adjacent to the PGandE power line). These development costs are reflected in the total project miscellaneous construction contingencies.

Not included in the Preliminary Cost Estimate are other related construction costs outside the boundaries of LRRRA, additional property acquisition costs, site engineering construction costs (including geological and miscellaneous safety-hazards engineering), development costs in proposed dedicated open space areas (PDOS) on adjacent property, and other costs not specifically defined and/or anticipated at this time.

This Preliminary Cost Estimate should be considered a planning tool for use in anticipating construction costs. Costs have been prepared in cooperation with the East Bay Regional Park District, whose experience has been invaluable in the preparation of this Masterplan. At the time of actual development, a more comprehensive evaluation should be done for each activity

area or related project and the cost estimates provided here should be revised.

APPENDIX A
LIME RIDGE REGIONAL RECREATION AREA
RESOURCE ANALYSIS

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RESOURCE ANALYSIS
LIME RIDGE REGIONAL RECREATION AREA

INTRODUCTION

Physical Setting

Lime Ridge is one of several major ridges that extend radially from Mt. Diablo. It is a rugged element of the Mt. Diablo foothills that serves as the primary physical divider between the developed portions of the cities of Walnut Creek, Concord, and Clayton. It also provides the visual backdrop for Ygnacio Valley.

Although residential development has encroached upon Lime Ridge, much of it is still undeveloped. Lime Ridge Regional Recreation Area (LRRRA) comprises 830 undeveloped acres on Lime Ridge as shown in Figure A. LRRRA is bounded by other Lime Ridge open space on the northwest and by the Lime Ridge and Woodlands subdivisions on the west and northwest, Ygnacio Valley Road on the north, Walnut Creek (Boundary Oaks) Municipal Golf Course on the southwest, the Rancho Paraiso property on the south and open, undeveloped private lands on the east and southeast. Six hundred and thirty acres are within the city limits of Walnut Creek, and 200 are within the city limits of Concord.

Part of the property forming LRRRA was acquired jointly by the Cities of Walnut Creek and Concord. The Walnut Creek portion was originally managed as a County R-8 Service Area established in 1974 by the County Board of Supervisors and disestablished in 1984. Now ownership and management responsibility reside solely with the Cities of Walnut Creek and Concord.

Area in addition to that purchased originally has been or is proposed to be dedicated to the Cities of Walnut Creek and Concord as a result of residential development. Such dedications include a previous dedication of 26.5 acres around the Lime Ridge subdivision west of Cowell Road and the future dedication of approximately 90 acres on both sides of Ygnacio Valley Road in the Newhall Northwest Parcel, if residential development takes place on that parcel. Approximately 154 acres is proposed to be dedicated by Rancho Paraiso on LRRRA's southern boundary.

Purpose of the Resource Analysis

To date, no recreational development or improvements have occurred on LRRRA. This Resource Analysis has been prepared in support of a Master Plan according to which LRRRA will be developed for recreational purposes as funds become available in the future. It begins with a brief summary of the

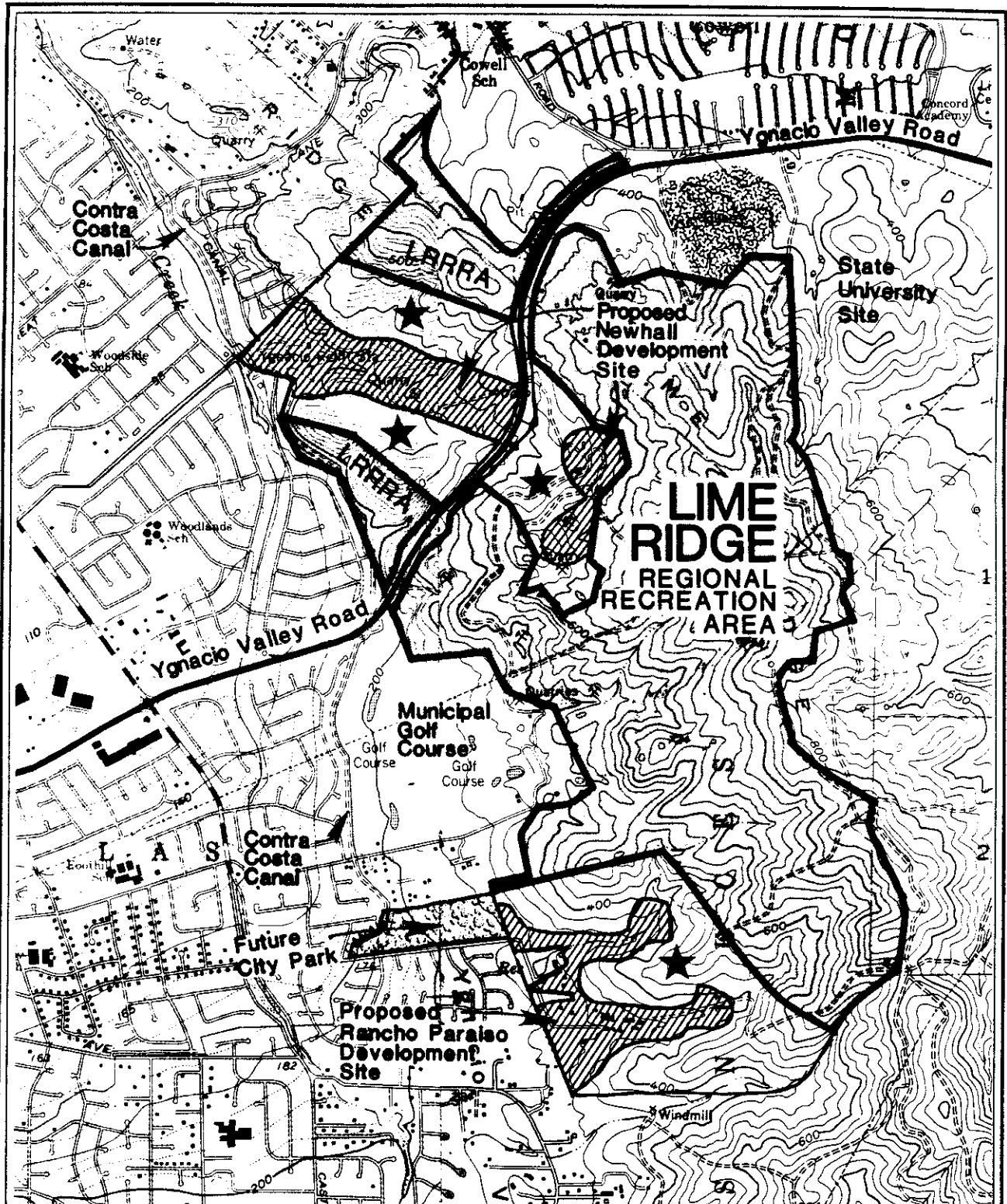
management goals, general operational plans, and policy guidelines that affect recreational planning and development. This summary precedes a more detailed description of the physical, biological, aesthetic, cultural, and human (man-made) resources and features of the Recreation Area. But policy, guidelines, and the actual resources and conditions present on LRRRA are not the only determinants that must be considered in planning. Adjacent land uses, access, existing and proposed trails and recreational facilities in the surrounding area, proposed residential and other development, etc. also affect planning.

LRRRA AND OPEN SPACE MANAGEMENT

The City of Walnut Creek has set forth management goals, operational policies, and guidelines in its General Plan, the Operational Plan and Policy Guidelines for the Walnut Creek Open Space, and the Walnut Creek Open Space Resource Management Plan. The City of Concord has an Open Space Plan but has not yet developed specific open space management goals, objectives, or guidelines. Consequently, no specific policies have been developed for application to Lime Ridge. The City of Walnut Creek currently manages Concord's portion of LRRRA to the latter's satisfaction and the City of Concord agrees in principle with the concepts incorporated in Walnut Creek's open space management documents (Gabrysiak, personal communication; Pond, personal communication). However, the City of Concord has not reviewed or approved the City of Walnut Creek's management policies, and Concord City Council would have to act on any recommended improvements in the Concord portion.

Policy and Management Documents

Walnut Creek General Plan. The Open Space and Recreation Elements of the General Plan (City of Walnut Creek, 1971) supply policy guidance for LRRRA. In the Open Space Element, the City defines "open space" to be public parks "left basically in their undeveloped state to be used for recreational purposes such as, but not limited to, hiking, bicycling, equestrian purposes, and picnicking. This definition sets the tone for planning with a strong suggestion as to what types of facilities, features, and uses are acceptable and what types are not. Major recreational facilities and amusement-park type facilities appear unacceptable.



SOURCE: U.S.G.S. 7.5 minute QUADRANGLES, WALNUT CREEK; CLAYTON



PROPOSED DEDICATED OPEN SPACE



LIME RIDGE REGIONAL RECREATION AREA



FIGURE A.

LIME RIDGE REGIONAL RECREATION AREA BOUNDARIES

The Open Space Element recognizes Lime Ridge for its natural resources, visual contrast with surrounding Clayton and Ygnacio Valleys, and recreational opportunities. Protection is described as depending upon planning for the entire area as a single entity and an action program is presented for the acquisition which has since taken place.

The Trails section of the Recreation Element states the role of hiking and bicycle trails as being non-motorized access between neighborhoods, open space, parks, etc., but describes bicycle trails as infeasible in steeply sloping open space areas. Equestrian trails are to supply access to equestrian areas, which includes open space and other facilities. Hiking trail slopes, widths, and vertical clearances, and surface conditions are prescribed and the trail systems with which links in LRRRA are possible are identified.

The General Plan provides a planning philosophy but only general management direction. More specific management direction is left to the following pair of documents.

Operational Plan and Policy Guideline for Walnut Creek Open Space. The Operational Plan and Policy Guideline (OPPG) (City of Walnut Creek, 1978) supplies basic planning and management policies that apply to LRRRA as a planning unit. While all of the policies apply to LRRRA, several are particularly important guides to planning. These policies state that:

1. planning should be conducted for the whole area rather than on a piecemeal basis (emphasizes General Plan policies);
2. management should be conducted to permit activities that are compatible with the preservation of natural features and landscape conditions;
3. peripheral staging areas and facilities are permissible;
4. other than emergency and maintenance vehicles, motorized vehicles should not be allowed in the open space area;
5. camping facilities will be minimum-development facilities only;
6. while interpretive programs are desired, no formal nature education and interpretation program will be provided;

7. except for trails, necessary service roads, and improvements necessary for camping, picnicking, and related outdoor activities, no features that are not consistent with the preservation of natural features and resources should be developed;
8. public roads through Open Space are considered incompatible with desired open space uses.

Resource Management Plan, Walnut Creek Open Space. The Resource Management Plan (RMP) City of Walnut Creek, n.d.) contains specific resource information for LRRRA. This resource information includes data on rainfall, soils, and vegetation and forage values and identifies structural improvements and current land use activities.

Management direction is supplied in the form of general area-wide and individual-unit goals as well as more specific objectives that suggest means by which the goals can be realized. In summary, these area-wide goals are:

1. maintain a relatively natural-appearing landscape that supports healthy, vigorous, diverse vegetation with trees of all age and size classes and forage levels sustained near productivity limits, and with wildlife habitat diversity maintained as high as possible;
2. manage the rangeland to produce revenues to cover all direct and indirect resource management costs (and at the same time reduce live fuel levels) while maintaining stable watersheds and the flow of high-quality waters from open space lands;
3. develop public appreciation of programs and practices and sustained provision of opportunities for nature-based recreation, including natural resource interpretation.

An additional goal for LRRRA is to reduce the visual disturbance associated with the scar created by the road up the west-facing slope to the television receiving station.

Among the related objectives, those that are most relevant to LRRRA include:

1. ensure proper forage utilization, establish range study plots, and remove unnecessary fences;

2. plant native species including those recommended by the Department of Fish and Game for wildlife habitat improvement, control noxious and poisonous range plants, control grazing through adherence to forage-use standards and sound range practices (rotational grazing, maintenance of forage use records, salt block placement away from water, stock pond fencing with troughs, removal of hazardous trees, etc.);
3. design and maintain roads according to proper standards (avoid unstable terrain; maintain specified grade, cut and fill slopes, water-bar placement; eliminate berms, etc.) and close or repair roads that do not meet standards;
4. preserve, restore, and enhance the habitat of rare, threatened, or endangered plant and animal species wherever necessary;
5. properly sign all access points, trails, and facilities;
6. do not plant species that would attract deer to Ygnacio Valley Road.

Management and Administration

The management framework for Open Space in the City of Walnut Creek includes the Parks and Recreation Commission and City staff. The Parks and Recreation Commission makes use and operational recommendations and is responsible to the City Council. City staff provides all administrative and management services, primarily through the efforts of its Park Superintendent and Park Rangers.

The Walnut Creek Open Space Foundation was formed to serve the City and the Parks and Recreation Commission as a citizens' advisory body. The Foundation views uses to be appropriate when they permit retention of LRRRA as open space land in a manner consistent with the General Plan definition.

RESOURCE ANALYSIS

This section of the report contains descriptions of all those factors which, together with the planning and management goals, policies, and guidelines, determine what options are available for recreational development in LRRRA. It includes descriptions of the local climate; physical, biological, cultural, visual, and aesthetic resources; structural improvements and existing facilities; and current and planned uses. The following section takes the analysis a step further by indicating what opportunities and constraints exist as a consequence of both on- and off-site conditions. Opportunities for and constraints to recreational development are shown in Figure B.

Local Climate

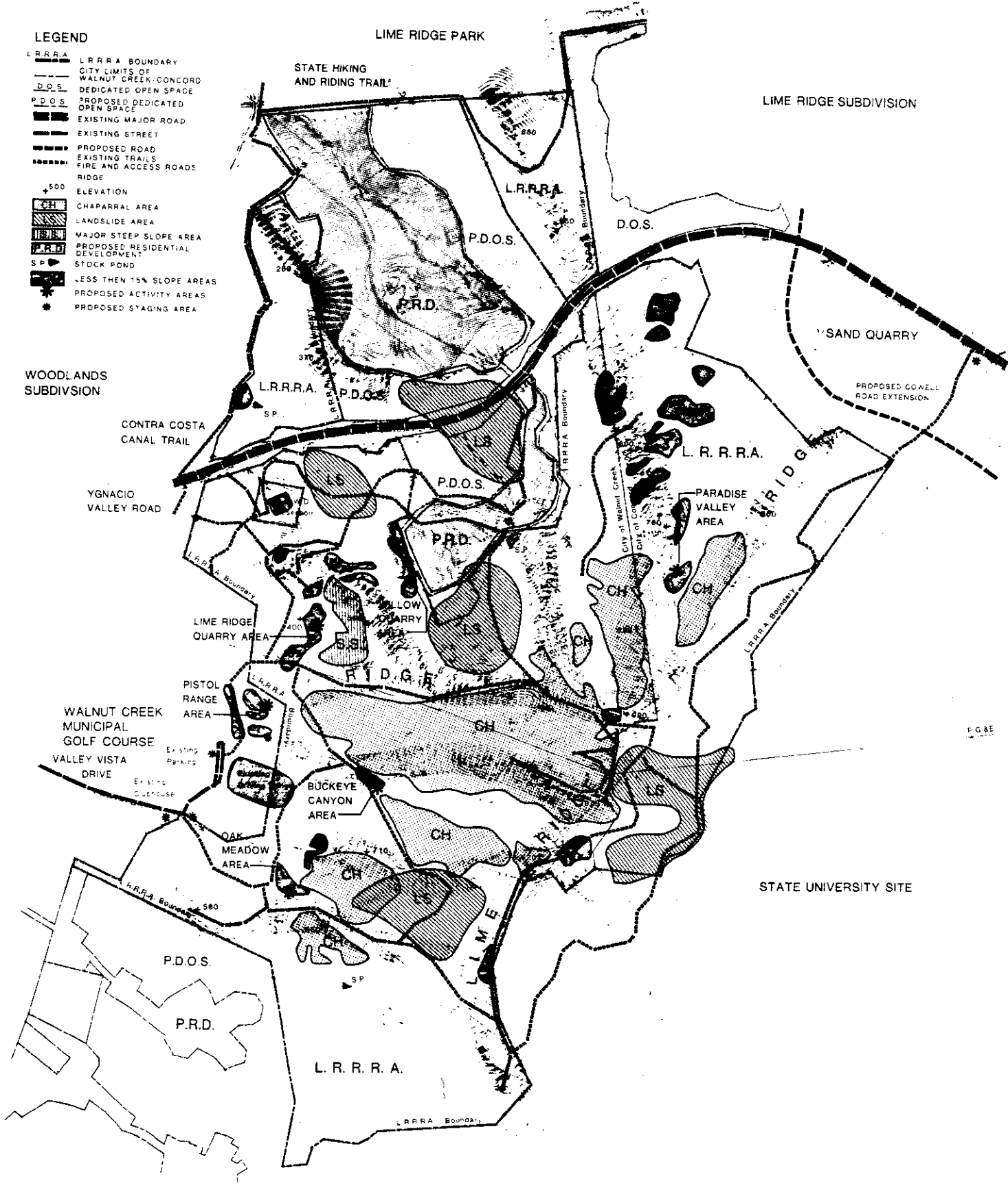
Precipitation on Lime Ridge varies each year, but ranges from approximately 17 to 20 inches annually across LRRRA. Seasonal variation in precipitation is typical of the surrounding area and central California in general. Rainfall is heaviest from November through March, with October and May occasionally receiving early or late rains. The summer is dry, with little rain falling between the months of June and September and none at all in July on the average.

Temperature variation follows a similar Mediterranean pattern. Mean temperatures are low during the wet winter months and high during the dry summer months, the difference being 25 degrees between a January low of 45.5°F and a July high of 70.6°F. Temperatures vary much less in the winter than in the summer. In the winter, morning lows are commonly in the low to middle 30's and mid-afternoon highs are in the 50's. Summer temperatures range from morning lows in the 50's to highs in the 90's and 100's. Summer days are typically sunny and, aside from photochemical air pollution in the Diablo Valley air basin, summer skies are generally clear. Summer fogs do not normally extend inland to the ridge but winter radiation fog in the lower areas is common (City of Walnut Creek, 1980).

Another important climatic variable in terms of recreational planning on LRRRA is local wind patterns. The prevailing wind direction is southerly, with winds from the south and west occurring over one third of the time. While much of LRRRA is exposed, Lime Ridge itself provides a protected environment on its leeward or eastern slopes. The west-facing slopes are exposed to winds regularly, but the quarries and the canyon bottoms provide local wind protection.

LEGEND

- L.R.R.R.A. BOUNDARY
- CITY LIMITS OF WALNUT CREEK-CONCORD
- P.D.O.S. DEDICATED OPEN SPACE
- P.D.O.S. PROPOSED DEDICATED OPEN SPACE
- EXISTING MAJOR ROAD
- EXISTING STREET
- PROPOSED ROAD
- EXISTING TRAILS
- FIRE AND ACCESS ROADS
- RIDGE
- ELEVATION
- CHAPARRAL AREA
- LANDSLIDE AREA
- MAJOR STEEP SLOPE AREA
- PROPOSED RESIDENTIAL DEVELOPMENT
- STOCK POND
- LESS THAN 15% SLOPE AREAS
- PROPOSED ACTIVITY AREAS
- PROPOSED STAGING AREA



DIAGRAMMATIC CONSTRAINTS/OPPORTUNITIES

LIME RIDGE REGIONAL RECREATIONAL AREA

CITY OF WALNUT CREEK / CITY OF CONCORD



CONSULTANTS
 Larry Seeman Associates, Inc.
 Environmental Consultants
 Berkeley, California
 Inouye Associates
 Landscape Architects/Planners
 Berkeley, California

SHEET
 FIGURE
 B

October 1985

Physical Resources and Conditions

Physical resources and conditions that affect planning include general terrain configuration, landslides and landslide-prone areas (high risk of landslides), slopes and the distribution and acreage of relatively flat and steep terrain, soils, and the network of drainage features. In LRRRA, the quarries are also important physical features.

Parent Rock. LRRRA is underlain by tertiary marine sediments that have been folded and faulted into their present positions (Earth Systems Consultants, 1979). According to Dibblee (1980), the parent rocks are Domengine sandstone, Nortonville shale and Cretaceous shales of the Panoche Formation. The Domengine sandstone is a tan sedimentary rock containing much feldspar and mica (arkosic). It underlies the soils along Lime Ridge, Paradise Valley, and the southwest portion of LRRRA. Nortonville shale is a clayey shale occurring west of the Domengine sandstone in the slopes above the Newhall south parcel and in the two open space parcels west of Ygnacio Valley Road. The Panoche Formation shale occurs along the eastern margin of LRRRA, primarily in the Concord section (City of Concord, 1976).

Landslides. Landslides are common features in part of LRRRA. With the exception of a small area near the water tank in the southwestern corner in the vicinity of the golf course, the entire area is designated in the General Plan as a high-slide-risk area, indicating the presence of slides and ground highly susceptible to sliding. The area near the tank is designated a moderate landslide risk, indicating that few slides have occurred and that the ground is only occasionally susceptible to sliding (reference). Several slides have been mapped in LRRRA and others, not included on existing maps, are visible in the field. Tension cracks indicate the potential for sliding at the edge of one quarry. These slides are shown in Figure B in the Opportunities and Constraints section of this Plan.

The largest slides mapped by Nilsen (1975) are in the inner bowl of the Newhall south parcel, an area that is proposed to be dedicated as open space to the City; on northwest-facing slopes above the Newhall south parcel between 560 and 760 foot elevation; and near the southern LRRRA boundary on a southwest-facing slope between 580 and 820 feet elevation (directly east of the water tank above the golf course). Smaller slides are mapped on the open space strips north of Ygnacio Valley Road. These slides have all occurred in the area mapped as possessing a high slide hazard.

Faults. Fault traces are shown in several locations on LRRRA. The Ygnacio Valley segment of the Concord Fault crosses Ygnacio Valley Road, passing north to south through the south Newhall parcel and the quarries to the base of the slope in the vicinity of the Walnut Creek Municipal Golf Course. Other traces include one passing through the east segment of open space north of Ygnacio Valley Road and another from the Ygnacio Valley segment to a point near the cable television station (Earth Systems Consultants, City of Walnut Creek, Community Development Department, 1983). A third fault of uncertain activity is shown in the Newhall Ranch Area Plan to extend south from Ygnacio Valley Road into Paradise Valley in the Concord portion of LRRRA.

Slope Conditions. Slopes in LRRRA range from level ground to essentially vertical cliffs at the margin of abandoned quarries. Very little of the entire area is level or has a surface slope of less than 15 percent. Slopes as steep as 100 percent characterize the rocky, chaparral-covered slopes and level or gently sloping ground occurs in the quarry bottoms, along ridgelines, and at the base of several small canyons. Areas where the surface slope is 15 percent or less (Figure B) include:

1. the base of Buckeye Canyon where it merges with Elderberry Canyon at elevation 460-500 feet; 0.5 acres of grassland and open buckeye forest;
2. the top of Buckeye Canyon at 775-810 feet elevation; 0.6 acres of grassland surrounded by steep chaparral- and oak-covered slopes;
3. southwest corner of LRRRA at the gate to Valley Vista Drive; 0.1 acres across from golf course parking lot;
4. ridgelines and associated saddles along Lime Ridge and the eastern ridge bordering Paradise Valley; exposed areas of variable size;
5. draw southeast of watertank behind golf course; 1.25 acres surrounded by steeper chaparral- and grass-covered slopes;
6. quarry bottoms, ranging in area to approximately 1.25 acres; protected by steep walls and vertical cliffs;
7. head of Paradise Valley; 0.2 acres in oak and buckeye woodland along major drainage;
8. railroad grades and haul roads in northwest quarter of LRRRA;

9. gentle grasslands immediately upslope from Newhall south parcel; 0.5 acres;
10. surface of Contra Costa County Water District's (CCCWD) Newhall Reservoir; 0.7-acre inholding to which access would require an easement and/or special agreements with CCCWD.

Soils. Soils on LRRRA belong to the Briones and Altamont series and the Altamont-Fontana complex. A considerable area has also been mapped by the U.S. Soil Conservation Service as quarried land.

The Briones soil is a sandstone-derived loamy sand containing as much as 85 percent sand and only 15 percent silt and clay. The soil occurs on the steeper slopes of LRRRA and is very shallow with no developed B horizon. It is excessively drained and has a high erosion hazard where the soil is exposed (U.S. Soil Conservation Service, 1977). The soil is so erodible because silt and clay, which act as binding agents to hold the coarser sand particles together, are present in such small amounts and the slopes, which are as great as 100 percent on LRRRA, are so steep.

The Briones soil occurs in the southern and southwest quarter of LRRRA, extend band-like up and over Lime Ridge into Paradise Valley on the northeast side.

Rock outcrops occur in association with the Briones soils. Field inspection shows that the outcrops are sandstone. The soils in these areas are shallower than the Briones soils, occur on steeper slopes, and are even more excessively drained. They are extremely erodible when the protective cover of vegetation is removed.

The Altamont clay soil differs considerably from the Briones loamy sand. It contains almost entirely silt and clay with little or no sand. Because of the high clay and silt content, the soil is only slowly permeable and not very erodible unless the vegetative cover has been removed. It occurs on slopes from 9 to 30 percent on LRRRA and its erodibility and runoff are directly proportional to slope in the undisturbed state. The Altamont-Fontana complex is a mosaic of Altamont clay and other soils which are not site-specifically identified. However, the Fontana series, which is representative of the fraction of the mosaic not occupied by Altamont clays, is a comparatively well-drained soil, no doubt because it was derived from sandstone. This complex of soils occurs upslope of the Altamont clay, between it and the Briones loamy sand on slopes ranging exceeding 30 percent. The Altamont clay and the related Altamont-Fontana complex occur on the strips north of Ygnacio Valley Road,

between the quarried land and the golf course, and along the southwest corner of LRRRA.

The U.S. Soil Conservation Service also maps a considerable portion of LRRRA as quarry land and does not provide a description of the associated soils other than to suggest that they may have been disturbed during mining operations. Quarried land occurs on the nose of Lime Ridge between the Newhall south parcel and the old sand quarry along Ygnacio Valley Road north of Paradise Valley, and between the Newhall south parcel and the golf course. Soils likely resemble those of the Altamont-Fontana complex or the Briones series, depending upon their location.

Areas that are particularly susceptible to erosion are indicated on the site opportunities and constraints map (Figure B).

Drainages. Lime Ridge is a prominent ridge in the middle of Pine Creek watershed, whose headwaters include the northwest slopes of Mt. Diablo. Shell Ridge forms part of the southwest watershed boundary and Olofson Ridge and Mt. Zion mark the eastern watershed boundary. Lime Ridge itself is a primary divider in this large watershed, shedding water west into Pine Creek and east into Galindo Creek. Galindo Creek merges with Pine Creek downstream in Concord before the latter flows into Walnut Creek.

Smaller spur ridges divide LRRRA into subwatersheds that possess generally southwest and northeast axes (Figure B). Paradise Valley, on the northeast side of Lime Ridge, and Elderberry and Buckeye Canyons, which drain southwest toward the golf course, are perhaps the most beautiful drainages, being both well-drained and vegetated.

No well developed channels exist in LRRRA. Most channels in the grasslands and woodlands are wide swales without defined banks to mark the course of yearly flow. Their physical appearance is often dominated by a series of steps which mark the channel's intersection with incised sets of cattle trails along the contours of the surrounding terrain. In the chaparral, where the side slopes are steeper, the channel bottoms are narrower but no better defined. The steep side slopes and narrow bottom indicate general long-term downcutting, but still no thread marks the limits of the low-flow channel.

The poor channel definition results from the small size of the tributary watersheds and the seasonal runoff. Most of the tributary watersheds are small. All on-site creeks are also either ephemeral or intermittent, as marked on the U.S.G.S. topographic quadrangle, carrying water only during and immediately following the rainy season. Although groundwater contributions

may keep channel surfaces locally wet and small puddles may persist through the spring, the creeks on LRRRA are not a year-round source of water. This runoff condition explains the need for and use of stock watering ponds and troughs throughout LRRRA and adjacent rangelands.

Biological Resources

Vegetation. The vegetation on LRRRA can be classified as belonging to four primary types. These are grassland, chaparral, oak woodland, and oak savanna. Each type is characterized or dominated by a combination of plant species. The common names of these species are used in the main body of this report; associated scientific names are provided in the attachment. Chaparral areas are shown in Figure B.

Grassland occurs throughout LRRRA on all slopes and exposures but is found primarily on Altamont clays and Altamont-Fontana complex soils. The grassland type contains primarily annual grasses and both annual and perennial forbs. Many of the annual grasses and numerous forbs are non-natives, introduced primarily from Europe. The more abundant grasses are wild oats, soft chess, foxtail chess, and foxtail fescue. To the extent that perennial grasses occur, the most common would be purple needlegrass, foxtail barley, California melic grass, and bluegrass. Common forbs include filarees, clovers, bird's foot trefoils, mustards, plantains, and thistles. Yellow and purple star thistle, artichoke thistle, milk thistle, and other thistles are common throughout LRRRA.

The grassland varies in color from winter green to late summer tan and brown, the changes associated with the annual cycle of growth and the drying of above-ground material in the summer. This change in aspect characterizes annual grasslands in Mediterranean climates.

Live fuels and forage weight vary naturally and are continually reduced through grazing. Range forage values, which are primarily grassland-based in LRRRA, are greatest on the Altamont and Altamont-Fontana soils. Net forage yield ranges from as little as 300 pounds per acre to 2300 pounds per acre. Yield is poorest in the chaparral-dominated areas on steep slopes in Briones loamy sands and rock outcrop areas, and greatest north of Ygnacio Valley Road.

Chaparral occurs on all slopes and aspects but is primarily found on ridge tops, steep slopes, and areas of rock outcrops and shallow soils. Chaparral is found on the east ridge of Paradise Valley, on west- and southwest-facing slopes north of the television receiving station, and in the southern half of the LRRRA between 520 and 700 foot elevation. In several canyons and

draws chaparral occurs on the drier, hotter south- and southwest-facing slopes.

The chaparral type is a dense, semi-impenetrable cover ranging in height from four to 12 feet and extremely variable in local species composition. The most abundant shrub species are chamise, buckbrush, black sage, coastal sage, Diablo manzanita, toyon, coyote bush, and yerba santa. Short and sometime stunted-looking coast and interior live oak are also scattered throughout the chaparral. Distinctly different phases (species combinations) are present, the more common including chamise-buckbrush, chamise-black sage, black sage-California sage, deer weed. Chaparral pea, which is a common constituent of the chaparral type in the Berkeley (East Bay) Hills but relatively uncommon on Mt. Diablo, occurs in small numbers on LRRRA. Bowerman provides an excellent description of the chaparral type in her text on the flora of Mt. Diablo (Bowerman, 1944).

The presence of chaparral in LRRRA is significant for two reasons. First, it is separated by a wide gap from similar vegetation to the southeast on the slopes of Mt. Zion and, second, it occurs nowhere else in Walnut Creek Open Space lands (Doyle, personal communication; White, personal communication). It also contains Diablo manzanita, which is an uncommon endemic species.

The chaparral type is a high-fire-hazard type which typically contains heavy live- and dead-fuel volumes, particularly after long periods between fires. The chaparral on Lime Ridge has not burned for several decades (Doyle, personal communication; White, personal communication). On the other hand, the availability of quality forage and associated range forage values are low.

Oak woodland and a more open oak savanna-like type together occupy an area third in size on LRRRA behind the grassland and chaparral types. The woodland types occur on all slopes and aspects, as do the other types, but they are more commonly encountered on north-, northwest-, and northeast-facing slopes of less than 60 percent. A related type dominated by California buckeye occurs on these slopes but is more common in the draws and canyons where the environment is more moist. In general, much of the oak woodland and oak savanna vegetation occurs elevationally between grasslands and the chaparral.

Blue oak, coast live oak, and California buckeye are the dominant tree species in these woodland types, although valley oaks are common east of Paradise Valley. Overstory tree height ranges from 15 to 50 feet depending upon soil depth and exposure, and diameters range from 6 to over 40 inches. Density varies but, depending upon tree height and canopy width, an oak woodland

with a closed canopy can exist with tree spacing exceeding 30 feet. As spacing increases, the woodland becomes a more open savannah.

The woodland and savanna understory is typically open with few shrubs. The most common shrub species is poison oak. Oak and buckeye reproduction is very scarce. Seedlings and young trees are uncommon, a result of only periodic combinations of good seed crops and ideal growth conditions and the continual grazing and browsing pressure by cattle and deer. The grassland extends into both the woodland and savanna, creating a ground-layer vegetation that is visually similar to that found in the open.

The visual aspect of the woodland types varies over the year, the seasonal differences greatest where the deciduous blue oak and buckeye are dominant. In the spring, the trees display bright new foliage. As the foliage develops, the blue oak leaves become more blue, the buckeye remaining a lighter green. By late fall or winter, both have lost their leaves but the buckeye retains its large leathery capsules, swinging ornamentally from naked branches.

Forage production and fuel hazard in the woodland and savanna is intermediate between those characterizing the grassland and the chaparral.

The quarries support a unique assemblage of shrub species not found elsewhere in LRRRA. Cotoneaster, poison oak, California sage, redberry, coyote bush, and toyon occupy the slopes and side terraces. The floors of the quarries support annual grasses similar to those found in the grassland, but some perennial bunchgrasses are also present. In one quarry south of the Newhall south parcel, cottonwood and yellow willow, the latter braced with large masses of aerial roots, indicate that water collects in the bottom to a depth of as much as six feet some years and that the quarry is one of the more reliable "natural" sources of water in LRRRA.

Wildlife. Wildlife habitats on LRRRA include grassland, chaparral, oak woodland, savanna, quarry, and seasonal pond. In general, wildlife species are found in association with those habitat types which fulfill their requirements for food, water, and cover. Depending on the species and its specific habitat requirements, an animal may use several habitat types or just one.

Grassland is one of the primary wildlife habitats found on LRRRA. However, Ygnacio Valley Road and adjacent suburban development affects the distribution of species in the grasslands on both sides of the road. The grasslands south of Ygnacio Valley Road supports all grassland-associated species found in central Contra Costa County. The species that use only or depend primarily upon the grassland include the California ground squirrel, pocket gopher, California meadow mouse, western harvest mouse, and western meadowlark, and lark sparrow. Species which move regularly between the grassland and other adjacent habitats include brush rabbits and western bluebirds.

Although they do not depend solely upon it, larger mammals and birds also regularly use the grassland for hunting or feeding. This group includes bobcat, coyote, black-tailed deer, red-tailed hawk, great horned owl, and occasionally mountain lion and golden eagle. Canada geese have also been observed feeding here. Due to the limited access of people and pets to LRRRA, wildlife use of the grassland has not been disturbed except along the western margin and the Ygnacio Valley Road corridor.

Wildlife use of the grasslands north of Ygnacio Valley Road is more limited. No adjacent stands of brush or woodland are present. As a result, most of the edge species which feed in the grassland and find cover in adjacent vegetation are absent. The area is also smaller, surrounded by development and does not have a direct connection to adjacent wildlands. The larger predators, such as mountain lion, bobcat, and golden eagle will not use them as a result, but a den of foxes has been observed in grassland on adjacent Concord open space north of LRRRA (Gabrysiak, personal communication).

The chaparral is a generally structurally uniform habitat. Shrub cover is typically high and the shrubs are consistently over six feet tall. Chaparral stand margins are most variable. Here the chaparral species occur with grassland species, forming a transition zone between the two types.

Bird species found primarily within the chaparral include wrenit, Bewick's wren, California thrasher, blue-gray gnatcatcher, rufous-sided towhee, sage sparrow, and rufous-crowned sparrow. These species remain within the shrubs, only occasionally moving through adjacent habitat types. Many other bird species regularly move between the chaparral and adjacent habitat types. This group includes Anna's hummingbird, scrub jay, bushtit, brown towhee, dark-eyed junco and white-crowned, and golden-crowned sparrows. Unusual species which could be present (but for which no sightings have been made) include the roadrunner and poor-will. These species have been observed in similar habitat on Mt. Diablo.

Larger mammal species use the chaparral type for rest and escape cover, as it provides better protection against intrusions than the other other habitat types on LRRRA. Bobcat, coyote, gray fox, and black-tailed deer all commonly seek cover in the chaparral. A variety of other small mammals are also found in the chaparral. They include brush rabbit, California mouse, pinon mouse, and striped skunk. Ring-tailed cats have been recorded from the area (a road kill on Ygnacio Valley Road) and are probably found in the chaparral.

The oak woodland supports the most diverse wildlife community on LRRRA for several reasons. The vegetation contains trees, shrubs, and herbaceous species in a multi-layered structure. Many species, particularly birds, are confined or are most commonly found in a particular layer of vegetation. The

larger number of layers increases the number of species which can use the type. The older oaks often have dead limbs and cavities which offer nesting or den sites. Furthermore, the oak woodland is highly productive. Several plant species produce abundant food crops. Acorn production varies from year to year but they are always highly sought by numerous species. The berry crops of several shrubs including toyon, poison oak, and coffeeberry are important food items. The woodland also supports a variety of insects which provide food for insectivorous birds which are primarily summer residents and nesting seedeaters which feed their nestlings primarily with insects.

Individual bird species' use of the oak woodland varies with each species' habitat requirements. For example, the ash-throated flycatcher, plain titmouse, and Hutton's vireo occupy the crown canopy and Bewick's wren, orange-crowned warbler, rufous-sided towhee, and fox sparrow, are found primarily in the shrub and herbaceous understory. Still others like the common flicker and robin move between the crown canopy and the ground and while the bushtit and ruby-crowned kinglet move between the crown and shrub layers. Species such as the scrub jay move among all the woodland layers.

Mammals are also common in the woodland although their use of it is not quite so structured or restricted to one particular portion of it. Fox squirrels are the most easily observed mammals in this type. The dusky-footed woodrat is also common, but although the large conical stick mounds indicate its presence, the species is nocturnal and rarely seen. Other common woodland mammals include the broad-handed mole, opossum, gray fox, and white-footed mouse.

The oak savanna borders woodland stands and serves to increase grassland species diversity. The trees serve as perch and roost sites for a variety of bird species which feed in the grassland, including the red-tailed hawk, American kestrel, common flicker, scrub jay, robin, western bluebird, dark-eyed junco and lark sparrow. Cavity trees in this type serve as the primary nest sites for western bluebirds and house wrens. California ground squirrels frequently dig their obvious burrows around the bases of the trees. The acorn crops feed a variety of species and becomes an important food source to deer, ground squirrels, and scrub jays during years when the crop is particularly heavy.

Rock quarrying has created a wildlife habitat which is not common elsewhere on the site. The quarry habitat contains three subtypes: clifflike bare rock surfaces; quarry bottom with its variable herbaceous plant cover; and quarry slopes, vegetated by chaparral shrubs (primarily toyon). The rocky areas are favored habitat of several reptiles including western fence lizard, California king snake, and rattlesnake. Rock wrens are confined to this habitat on the site. The rock piles also provide den sites for mammals such as

striped skunk, raccoon, California ground squirrels, and possibly coyote depending on the size of the hole. The brushy slopes are important habitat for several songbirds which find cover in the brush while feeding in adjacent quarry or grassland areas. This group includes Bewick's wren, mockingbird, lesser goldfinch, rufous-sided towhee, brown towhee, and golden- and white-crowned sparrows. Poison oak and toyon are important both as cover and berry producers.

The steep, bare rock areas resemble cliffs and attract cliff-associated species such as the white-throated swift and cliff swallow. Red-tailed hawks, American kestrels and other raptors roost on small ledges but none appear to have been used as nest sites.

Several seasonal ponds are present on LRRRA. All have been created by past quarrying activities or were constructed for use as stock ponds. They fill in winter from rainfall and evaporate in spring or summer, the length of available water a function on pond depth and winter rainfall volume. These ponds offer breeding habitat for amphibians such as the pacific tree frogs and western newt and are occasionally used by migratory ducks including mallard, pintail, and American wigeon. These ponds also provide an important source of water for terrestrial wildlife because no permanent or even seasonal streams are present on LRRRA. These ponds generally provide water for most of the year but the closest permanent sources of water are on the golf course.

LRRRA is within the known range and contains suitable habitat for the Alameda striped racer, a species classified as rare by the State of California. The snake has been observed on Mt. Diablo in habitat similar to that found on LRRRA but has not been observed on LRRRA. This snake occupies mixed areas of grass, brush, and rocks such as found in the chaparral and the quarries. If it occurs on LRRRA, it would most likely be found in these areas.

No other classified wildlife species have been recorded from or were observed on or in the vicinity of the site.

Sensitive Plant and Animal Species. Observations by individuals familiar with the Lime Ridge environment (Doyle, personal communication; Corbyn, personal communication; Bowerman, personal communication) and records maintained by the California Natural Diversity Data Base indicate that several uncommon plant species either do or could occur on LRRRA. These species include Diablo manzanita (Arctostaphylos auriculata), California snakeweed (Gutierrezia californica), scarlet penstemmon (Penstemon centranthifolius), the golden globe lily (Calochortus luteus), and mallow (Malacothamnus hallii). Rock sanicle (Sanicula saxitilis) occurs on nearby Mt. Diablo but is not likely to occur on LRRRA because of the absence of chert in rock slides (Bowerman, personal communication).

The Diablo manzanita occurs abundantly in chaparral at the upper limits of Elderberry Canyon (above 720 foot elevation south of the cable television station) and occasionally along the southwest-facing slope of Lime Ridge north of the station.

The snakeweed occurs in chaparral, and the buckwheat and mallow occur at its margins (Bowerman, personal communication). The golden globe lily occurs in shaded grasslands, and the the penstemmon in piled material that has been moved to the edge of one of the old railroad grades near the western edge of the LRRRA.

None of these species has been designated as rare or endangered by the state or federal government, but all are valued because they are endemic to Mt. Diablo and its adjacent foothills or are unique by virtue of their unusual occurrence. For example, the penstemmon is known only from southern California locations except for this and one other in Contra Costa County; the buckwheat is known from Santa Cruz County (Doyle, personal communication; Bowerman, personal communication).

Cultural Resources

LRRRA contains evidence of use during ethnographic times as well as more recent historical use for limestone quarrying and livestock grazing. A search of records at the Cultural Resources Facility, Sonoma State University, revealed that the area was once used by Bay Miwok peoples and that seasonal or year-round village sites and/or task-specific sites (such as for acorn processing) may be present (Baldrice, 1979). An archaeologically significant site, possibly used as an encampment, has recently been discovered on LRRRA. This site consists of a scatter of Francisco chert, quartzite, and obsidian flakes, chert cores, and possible hammerstones in a clearing surrounded by dense chaparral.

Because the site has not been archaeologically tested, its age and the culture(s) it represents are not known. However, it appears that the site may have the distinction of being the highest open camp on the slopes of Mt. Diablo. The site has been designated part of the California Archaeological Inventory (CA-CCO-473).

During the historic period, the Lime Ridge area has been used for grazing cattle, farming, and limestone quarrying. Crops raised in the area include hay, grain, grapes, berries, pears, almonds, prunes, apricots and various vegetables. The abundant deposits of limestone and beds of clay were used in the manufacture of a high-grade cement from about 1850 to 1950.

Lime deposits were discovered on Lime Ridge in 1850 by Frank L. Such and William E. Whitney. Soon after, Such and Whitney erected four limekilns with 450-barrel capacities. (Heating limestone in kilns produces quicklime, or caustic lime, which is used to make cement.) In 1862, large quantities of lime were manufactured on Lime Ridge, but production began to dwindle due to competition from the Santa Cruz area. Between 1868 and 1900, lime manufacture did not occur on Lime Ridge. After 1900, the area once again became active when the Cowell family expanded their Santa Cruz operations onto Lime Ridge. In 1906, they incorporated the Cowell Portland Cement Company and began constructing a plant north of Ygnacio Valley Road. The plant started operation in 1909, and the company eventually constructed the town of Cowell, with a store, hotel, employee boarding house, and school. The company was still in operation in 1940 and possibly through the mid-1950's (Anthropological Studies Center, 1980; Emanuels, 1982).

Evidence of quarrying activities in LRRRA includes several quarries, access roads connecting each quarried area, railroad ties, spikes, and a railcart wheel. Access roads in LRRRA were probably used to cart the quarried limestone from the quarries to the limekilns and then on to the main plant for shipment to Bay Point (Port Chicago). During the time of operation by the Cowell family, transportation of the material occurred by rail. The remains of a limekiln are located south of Ygnacio Valley Road in the adjacent Newhall Northwest Parcel. The kiln is within the vicinity of the original kilns built by William C. Whitney in 1850 and may be one of the first built in California. The kiln has been characterized by cultural resource specialists as an extremely significant feature.

Visual Resources

The City of Walnut Creek, in its 1971 General Plan, has identified Lime Ridge as an Open Space Element forming "an important visual contrast with urban development in Ygnacio Valley and as a greenbelt separator with municipalities to the east." This statement suggests that the prime visual resource of Lime Ridge lies in being perceived as a natural open space in contrast to its surrounding urban environment. Therefore, both views into the surrounding area as well as views into Lime Ridge and LRRRA are important visual considerations.

Along its ridgelines, the LRRRA affords expansive panoramic views of the surrounding cities and other regional open space areas. Distant views include Mt. Diablo to the southeast, Shell Ridge, Las Trampas Ridge, and the Briones Hills, and the cities of Walnut Creek, Pleasant Hill, Concord and Clayton.

Middle-distance views include the Walnut Creek Municipal Golf Course, Ygnacio Valley Road, the operating Kaiser Quarry, the proposed Newhall Development site, and the old Cowell Sand Quarry.

Lime Ridge is highly visible from the surrounding residentially developed areas. Highly traveled Ygnacio Valley Road provides good opportunities to view it, especially its north, west, and south portions. These areas are most visible to the surrounding communities. Views of Lime Ridge and LRRRA and adjacent undeveloped property include vast expanses of grassland hills. The chaparral and oak woodland are visible from the road but are more distant from the typical viewer. The chaparral is located generally on steep slopes and ridgetops, and the oak-woodland and savannah are scattered on the site, mostly on north-facing slopes.

Man-made features on site have little effect on the visual quality of LRRRA with the exception of the Concord cable television facility and the scar associated with the road approaching it from the west (discussed elsewhere). The facility is situated at an elevation of approximately 1000 feet and crowns the highest point on the site and is extremely visible from all directions. Road cuts and quarry scars are also highly visible from off the site.

Although the quarries are evidence of man's most significant on-site disturbance, they are not generally visually detrimental except for the largest quarry on the west-facing slope above the Walnut Creek Municipal Golf Course. The quarry bottoms and canyons are generally the only areas on LRRRA not visible from off-site. Buckeye and Elderberry Canyons both of which run perpendicular to the main ridgeline, southwest down towards the golf course, are attractive, with generous growths of trees. Paradise Valley runs north from the cable television facility towards the Cowell Sand Quarry site. This intriguing valley is surrounded by steep topography, which completely encloses a beautiful oak-covered floor, hiding it from view.

Structural Improvements and Facilities

Structural improvements on LRRRA include access roads/fire trails, livestock reservoirs and water troughs, utility lines and facilities, and fencing.

Mining-related Features. In addition to the quarries and associated railroad grades and haul roads, many features indicate that LRRRA was once mined. A small tin shed sits in one of the smaller areas quarried on the northern nose of Lime Ridge, and old railroad tracks and ties are scattered about. Also, in the southwestern quarter of the site, a 90-foot-long section of half-round, 24-inch metal pipe extends from the edge of a pair of small

quarries downslope toward the water tank behind the golf course. A gulley has been eroded into the lower slope below it. The pipe was likely used as a flume of sorts to transport material down from the relatively inaccessible quarries. These and other small features are reminders of previous uses.

Grazing-related Features. LRRRA is used primarily for cattle grazing. A single permittee uses LRRRA, Newhall lands along Ygnacio Valley Road, and other private properties. Grazing-related features include several stock watering ponds and troughs and the fences that mark past and present property lines. Four stock watering ponds are present, all of which are embankment ponds formed by placing small dams across existing drainage channels. Three of these ponds are in LRRRA parcel south of Ygnacio Valley Road. Of these three, one is located at the southern site boundary among some oaks at elevation 560 feet, a second is located upslope, one-quarter mile north of the first in grassland at an elevation of 661 feet, and the third is situated at the boundary between LRRRA and the Newhall south parcel at elevation 521 feet. The fourth pond is located north of Ygnacio Valley Road above the Contra Costa Canal at elevation 180 feet. Currently, no fences restrict grazing between the Newhall Land and Farming Company's parcels along Ygnacio Valley Road and the LRRRA property so that cattle have access to several additional ponds on Newhall land. Another pond has been constructed just outside the southeast corner of LRRRA.

Several watering troughs are distributed on and near the site but none contained water in the winter of 1984-85. One is on LRRRA south of Ygnacio Valley Road northeast of the Newhall south parcel and the other is just outside LRRRA adjacent to the municipal golf course driving range.

LRRRA's boundaries are not entirely fenced. The south, west, and north (along Ygnacio Valley Road) boundaries are fenced. The eastern boundary and boundaries between Newhall Land and Farming Company property and LRRRA along Ygnacio Valley Road are not fenced and cattle range freely between LRRRA land, Newhall land, and other private property. Also, the gate at the top of the ridge along the south property boundary has been removed and cattle cross the south boundary through this gate.

Fences will be constructed around the developed portions of the Newhall north and south parcels to mark the boundaries between these areas and those to be dedicated to the City of Walnut Creek as open space.

Roads and Trails. The fire trails in LRRRA (Figure B) are maintained by the Contra Costa County Consolidated Fire District with annual grading of a 12-foot dirt base. Grading occurs in the spring following the wet season and

is carried out to ensure that roads are passable. Ruts are filled and wash-outs are repaired, but the roads are maintained not as all-weather surfaces but for summer use only (Frank Nunes, personal communication).

Currently, some sections of the road network maintained by the Fire District are in poor condition. Sections of the road into LRRRA from Ygnacio Valley Road in Concord (road 11-14, leaving Ygnacio Valley Road south of the Larwin Avenue-Sheepberry Court intersection) are badly rutted or severely eroded and approximately 600 feet of the pipeline road leading to the Concord TV station from the west is eroded to the base parent material. The latter section section is a scar, highly visible from Ygnacio Valley to the west. The state of disrepair of these sections is attributed to year-round use by Concord TV maintenance trucks.

In addition to the Fire District-maintained roads, there are several other roadways and trails existing on LRRRA. These roadways remain from quarrying activities or are currently used in connection with livestock grazing on the property or as access to utility facilities. Some of the roads and trails on LRRRA are impassable and end without connections to other roadways, sometimes on the edge of quarried areas. The Fire District attempts to limit use of such roadways by placing dirt mound barriers at their entrances.

No connections currently exist between trailways on the site and hiking/riding, and bicycling trails in the vicinity of LRRRA.

Utilities. LRRRA contains several utility line easements as well as inholdings or leases for utility-related facilities. These lines include the following: an overhanging electric wire facility extending from the Municipal Golf Course eastward across the LRRRA to the State of California property with easements granted to Pacific Gas and Electric Company (PG&E); a pole line extending from the Newhall Reservoir access road eastward to the eastern property line with an easement granted to Pacific Telephone and Telegraph Company; an underground gas pipe line between the overhanging wire facility and the east property line with easement granted to PG&E; and a cable television line along an unrecorded alignment with easement granted to Concord TV Cable Corporation.

Utility-related facilities on LRRRA include a cable television receiving station and the Newhall Reservoir. The Cable television station is located in the southeastern portion of LRRRA at an approximate elevation of 985 feet. It occupies a parcel approximately 220 feet by 220 feet leased to Concord TV Cable and contains receiving towers and operations area. A blanket easement has been granted to Concord TV Cable in a portion of LRRRA for placement of cable lines and access to the station. Access to this station occurs regularly via

panel truck along Fire Trails 10-1 and 11-14. Year-round use of these trails has resulted in deep ruts and unsafe conditions along steep sections. The Newhall Reservoir is an inholding located just south of Ygnacio Valley Road near the western border of LRRRA. This reservoir is a covered reservoir that is owned and operated by the Contra Costa Water District (CCWD). This reservoir serves zone 3 of the District's service area. A roadway easement through LRRRA from the reservoir to Ygnacio Valley Road has been granted to CCWD.

Current Land Uses

Grazing is the sole area-wide use. A single permittee leases the land and runs cattle on LRRRA on the basis of an annually set animal-unit-month rate. Revenues from grazing on the Concord and Walnut Creek property is shared although grazing is managed by the City of Walnut Creek's Open Space Ranger.

The Concord television receiving station's effects on LRRRA are restricted to those within the fence and lines into and out of the station and to those associated with vehicle (panel truck) access. The road network is also used for access by the rancher, PG&E, and the Consolidated Fire District.

Recreational use of LRRRA is informal. People of all ages use the area for the purposes to which general development is directed, including hiking, bird watching, nature interpretation, etc. Bike trails, some crossing contours from the base to top of slope, indicate that dirt bikers also use the area.

MASTER PLAN OPPORTUNITIES AND CONSTRAINTS

On- and off-site features, uses, and conditions offer certain opportunities and place certain constraints upon the potential use of LRRRA. Management policies and guidelines play the same role. This section summarizes all non-policy-related opportunities and constraints and indicates where measures are necessary to protect resources in developing the Master Plan for LRRRA. Figure B shows these constraints and opportunities.

Off-site Opportunities and Constraints

Adjacent Land Uses

1. Residential land uses surrounding LRRRA include the Diablo Shadows Subdivision to the southwest, the Woodlands Subdivision to the northwest, and the Lime Ridge Subdivision to the northeast. These residential areas are essentially built-out and no significant changes in

their development pattern are expected to occur over the next several years. Residents of these areas provide a local source of LRRRA users who could take advantage of existing and proposed trailway connections. Residents of the Diablo Shadows and Woodlands Subdivisions could use the Contra Costa Canal Trail and Canal Loop Trail to access LRRRA and residents of the Lime Ridge Subdivision could use the State Hiking/Riding Trail to access LRRRA.

2. The Newhall Northwest Parcel, a 217-acre parcel in the northwest portion of LRRRA, is proposed for development with 442 townhouses, patio homes, and condominiums. Of these units, 332 would be located in the portion of the parcel north of Ygnacio Valley Road and 120 would be located south of Ygnacio Valley Road. Approximately 175 acres of the parcel would be developed as landscaped areas and paths or left as open space dedicated to LRRRA. The Newhall development would include a number of recreational features which could be tied into improvement of LRRRA. These features include an equestrian trail loop extending northward from the existing cattle undercrossing and connecting with the State Hiking and Riding Trail along the north and northwestern boundaries of LRRRA; a small picnic area along the equestrian trail and a pedestrian and bicycle trail with par course extending through the project and connecting with the State Trail and the Canal Trail on the north and with a proposed gated accessway to LRRRA on the south. Development of a public parking area for access to LRRRA is also proposed as a component of the Newhall development, subject to the Master Plan.

The Newhall development offers opportunities for LRRRA in that it would provide a number of trailways and other recreational features and would result in a local population of park users who would not be dependent on vehicle access. It also provides access via the project entry that would otherwise not be available. This access would have to be coupled with a parking or staging area for open space users to avoid conflicts over limited available parking with project residents. However, the Newhall development would also pose several significant constraints to recreational development of LRRRA. The dedicated area north of Ygnacio Valley Road would be surrounded by residential development and development of the south parcel would result in an intrusion into LRRRA, rendering the section between the homes and Ygnacio Valley Road less attractive to open space users. In both areas, the visual intrusion and noise would diminish the rural, natural quality of adjacent open space and reduce the quality of recreational experiences. These dedicated areas may not be suitable for facilities other than trails and picnic tables. Improvement of those quarry features located above the development as sheltered recreation

areas would be less desirable than those further south in LRRRA. Potential conflicts between project residents and park users and trespassing by kids and domestic animals must also be considered for portions of LRRRA near the Newhall site.

3. Residential development is proposed on Rancho Paraiso (132 detached single-family units and 64 attached single-family units), a 207-acre site south of LRRRA. However, 153 acres of open space will be dedicated to the City, a trail will be constructed to connect the ends of two proposed cul-de-sacs, and a riding and hiking trail along the western edge of the site, as called for by the City's General Plan. This trail will connect Shell Ridge Open Space via North Gate Road with a Community Park Site proposed south of the Boundary Oaks Racquet Club and with LRRRA. The Master Plan for LRRRA should include provision for this trail to ensure that it connects with other trails and provides access to activity areas. As with other adjacent residential uses, Rancho Paraiso would provide a local source of LRRRA users but would impose limitations on potential improvements in the portion of LRRRA near it.
4. An approximately 12-acre parcel owned by the Newhall Land and Farming Company and located adjacent to LRRRA is zoned for residential development. This parcel is south of Valley Vista Road across from the golf course parking lot. Because of its position between Arbolado Park, the Boundary Oaks Tennis Club, and the golf course, this parcel is particularly attractive and offers a variety of advantages and benefits as a public use area.
5. Plans for development of the Newhall Sand Quarry north of Paradise Valley have not been formally submitted but in the Newhall Ranch Area Plan the area is designated for residential and commercial development (City of Concord, 1976).
6. Plans for the adjacent State University parcel have never proceeded. However, the Newhall Land and Farming Company has an option on the property in the event that plans for a university do not materialize. Whether university or residential development occurs, the City of Concord has established a corridor on the property as an open space strip that would permit a trail between its Galindo Creek Open Space Corridor and LRRRA. According to the Newhall Ranch Area Plan, residential development would be permitted in the northern and eastern portion of the property. The effects of this development on LRRRA would be limited to the effects of residences on adjacent lower ground being visible from the Concord portion of LRRRA.

Trails/Equestrian Facilities Existing and proposed equestrian/hiking and bicycling trails in the vicinity are depicted in the City's Trailways Map (City of Walnut Creek, 1983).

1. According to the Walnut Creek General Plan (City of Walnut Creek, 1971), local trails are necessary to: 1) connect with regional trails; 2) connect with proposed open space; 3) provide access from low-density, semi-rural neighborhoods; and 4) provide access to and from public equestrian facilities. Trails can generally be shared by hikers and equestrians. In open areas, trails can follow dirt, fire, or service roads and few improvements are needed.
2. Proposed trails in LRRRA shown on the City's Trailways Map include an extension and loop along the southwestern portion of the area and a second loop around the two northern parcels of the area (north of Ygnacio Valley Road). These trailway extensions would connect LRRRA with the State Hiking/ Riding Trail along its north and northeast boundary; the Contra Costa Canal Trail, which extends along the Canal north of Ygnacio Valley Road; and the Canal Loop trail, which extends along the Ygnacio Canal to the west of LRRRA. Upon completion of these connections, passage would be provided from Lime Ridge to Arbolado Park, the Shell Ridge Open Space Area, Diablo Foothills Regional Park, Mt. Diablo State Park and Sugarloaf Open Space Area to the south of the LRRRA, the Heather Farm Community Park and Equestrian Arena to the West, and the Black Diamond Mines Park to the east in Clayton.
3. The proposed Newhall development would include provision for equestrian and hiking Trails connecting the portion of LRRRA south of the development with the State Hiking/Riding Trail. Proposed trail-associated facilities would include a picnic area and a par course.
4. The proposed Rancho Paraiso development would include a section of the Lime Ridge-Shell Ridge hiking/riding trail along its western boundary, connecting via North Gate Road, Trail's End Drive, the Pine Creek Flood Control Detention Basin, Comistas Drive, and Hanna Lane to Shell Ridge. The North Gate Road Trail Complex consists of a main trail along North Gate Road leading to Mt. Diablo and two feeder trails leading from Pine Creek and the Castle Rock areas to North Gate Road as well as the main trail.
5. The City of Concord desires a trail connection between LRRRA and Galindo Creek Open Space Corridor, representing one opportunity for a trail connection at the southeast corner of LRRRA. This connection, which would cross Newhall Land and Farming Company land, is identi-

fied on the Newhall Ranch Area Plan and would be dedicated as open space in some fashion when and if development occurs.

Designated in the Newhall Ranch Area Plan, the Galindo Creek Open Space Corridor provides a 100- to 200-yard-wide corridor along the Creek extending from Ygnacio Valley Road southward to Mt. Diablo State Park. The Corridor extends along the eastern portion of the State University parcel and part of the western portion of Pine Hollow Road. The Corridor acts as a primary extension of the State Riding and Hiking Trail, connecting it with Mt. Diablo State Park.

6. The State Hiking and Riding Trail and Inner Lime Ridge open space (north of LRRRA) are extremely important recreational facilities in the City of Concord. Connections between LRRRA, Inner Lime Ridge open space, and the State trail are, therefore, equally important.
7. Equestrian and hiking staging areas are defined in the Walnut Creek General Plan as being sites with some parking, restrooms, water for both humans and horses, and possibly picnic tables. Use of the LRRRA by equestrians and hikers would be enhanced if one or two staging areas were provided. Staging areas could be provided on either or both ends (north and south) of LRRRA and on the eastern edge in the vicinity of the university site.
8. Local equestrians indicate that demand is high for the proposed riding trail connections in LRRRA. Facilities and trails similar to those on Shell Ridge are desired. In general, rest facilities should be provided for approximately each two hours of trail length.

Access Points

1. A small relatively level area exists along Valley Vista Drive across from the Boundary Oaks Racquet Club parking lot. It offers parking and staging opportunities and requires minimal cut and fill. It would offer good access to LRRRA and added parking for the golf course, racquet club, and the proposed community park site. Connections from the Canal Trail, the proposed trail along the Rancho Paraiso property, and existing trails in LRRRA could be easily made to this access point. Provision of access and parking would require minimal improvements to Valley Vista Road and Fire Trail 10-16. The City of Walnut Creek has a CIP to improve this location.

Parking and staging facilities at this location would not diminish LRRRA resources. Improvement of this area as an entry point to LRRRA would also be desirable as it is within short walking distance of two

beautiful valleys dotted with distinctive oak and buckeye trees located to the east and northeast in LRRRA. This access point would be within walking distance of residents of the Boundary Oaks subdivision and the proposed Rancho Paraiso development.

2. Contra Costa Water District's (CCWD) Newhall Reservoir is designed to support the weight of maintenance vehicles and, depending upon the design, could be capable of supporting several vehicles. If the tank can support parking, the Reservoir would be a potential parking and staging area for LRRRA. Such use would require an agreement between the CCWD and the City of Walnut Creek. This access point to LRRRA would provide a connection from the Contra Costa Canal Trail and would allow for a relatively safe entry off of Ygnacio Valley Road.
3. The Transportation Element of the City of Concord's General Plan indicates that a frontage road extension of Cowell Road could be constructed from Ygnacio Valley Road south to Pine Hollow Road. This road would provide cross traffic through the Newhall Company's sand quarry parcel and would offer potential access to LRRRA. It would cross an existing road between the sand quarry parcel and the state university parcel and create an intersection at which staging and/or parking facilities could be constructed. Currently, two possible staging areas would be possible at the intersection of this existing road with Ygnacio Valley Road. A stable occupies the area southeast of the intersection and a raised level pad has been constructed southwest of the intersection. Each also offers staging and/or parking potential although there are some constraints:
 - a. no access is available for westbound traffic on Ygnacio Valley Road.
 - b. a left-hand turning lane could be required for eastbound traffic.
 - c. in general, the creation of new intersections on Ygnacio Valley Road in the vicinity of LRRRA is not desirable.
4. Ygnacio Valley Road is generally not suited for access to LRRRA as it would require the construction of additional intersections on a roadway which is designated in the General Plan as a freeway with limited access. Currently, access to LRRRA from Ygnacio Valley Road is limited to maintenance and emergency vehicles. Use by the general public would be unsafe and inconvenient due to the narrow shoulder, high speed of traffic, and lack of left-turn and U-turn lanes. Improve-

ment of LRRRA should discourage undesignated access along Ygnacio Valley Road by providing safe alternatives.

On-Site Opportunities and Constraints

Climate

1. The only climatic feature that poses constraints to recreational development or use are the occasionally strong local winds. Ridge-lines and slopes with western aspects are exposed. Opportunities for protection are afforded by the quarries all along the northwest and western portions of LRRRA. If engineering analyses of the stability of quarry cliffs and slopes indicate that safety hazards are either acceptable or can be reduced to such a level through engineering, these quarries would offer excellent sites for development of facilities such as stables, small camp grounds, and clusters of picnic tables.

Physical Conditions

1. Soils offer constraints to development in terms of future road and/or trail development. The Briones soils and associated rock outcrops are shallow and moderately to severely erodible when exposed to the impacts of direct rain splash and surface water runoff.
2. No new roads should be planned into the interior of LRRRA. However, if a road is planned, no section should be constructed across landslides. The maps that show the landslides on LRRRA indicate approximate locations and extents and field inspection of any proposed road alignment should be conducted by a certified engineering geologist before a final location is decided.
3. Slopes are generally steep and very few relatively level areas exist where opportunities exist for developing major facilities. Ten such levels areas have been identified above.
4. The quarries in the northwest corner of LRRRA (south of Ygnacio Valley Road) offer opportunities for placement of recreational facilities such as small campgrounds, stables, picnic tables, etc. which, if constructed, should not be visible from the surrounding areas. These quarries are also protected from winds, offering advantages not associated with unmined terrain. The bases of canyons also offer similar advantages.

5. No development should take place in areas supporting chaparral vegetation. These areas are extremely erodible except for the occasional level sites.

Biological Resources

1. No constraints to development are posed by grassland vegetation.
2. Any recreational development in wooded areas should be planned to minimize tree removal, all construction operations should take place outside the drip lines of trees to be retained, and replanting should result in the successful reestablishment of a number of trees equal to the number removed. The species removed must also be the species replanted. If planting stock is purchased commercially, the seed from which the stock was grown should have been collected within the County. If stock is grown from seed rather than being purchased commercially, seed should be collected on LRRRA. Planted seedlings and/or older stock should be protected by wire cylinders until they have achieved a height sufficient to ensure vertical growth in spite of cattle browsing after cylinders are removed.
3. Grading operations may take place within the drip lines of some trees to allow room to operate and if, by allowing such encroachment, other trees can be preserved. Compacted soil must be loosened and any excess material above the pre-construction surface grade must be removed from within the drip lines and be respread and stabilized elsewhere where erosional opportunities are minimized.
4. Rare plant populations offer no constraints to recreational development except for Diablo manzanita and scarlet penstemmon. No areas containing either species should be disturbed. The distributions of the other sensitive species are not known at present but implementation of any plan should be preceded by a rare plant survey in the vicinity of proposed facilities and adjustments in locations should be made wherever the sensitive plant species identified above would be affected.
5. In spite of constraints to development in wooded areas, trees provide visual screening which can be used to hide smaller facilities such as clusters of picnic tables in otherwise relatively visible terrain. They also provide shade, a distinct benefit to summer LRRRA users.
6. Wooded areas also exist in relatively non-visible areas such as Buckeye Canyon and at the head of Paradise Valley. A small wooded area also occurs at the southern margin of LRRRA, straddling the LRRRA-

Rancho Paraiso property line. The off-site portion of this wooded area is in land that would be dedicated to the City as public open space. These wooded areas offer attractive settings for facilities for LRRRA users and/or Rancho Paraiso residents.

7. The City requires that no plantings be made that would attract deer to Ygnacio Valley Road, and that any plantings around recreational facilities should be with native materials. No "type conversions" should be made except in the quarries where grading and/or vegetation screening are necessary to limit visibility. In other words, outside of the quarries, tree and shrub plantings in grasslands and understory shrub plantings in wooded areas would not be acceptable. In the absence of type conversions, use of only native species found in LRRRA plantings should allow for implementation of the Master Plan.
8. If LRRRA facilities are planned for quarries where plantings are necessary to provide the required screening, facility siting and planting should be planned to allow plantings to be made prior to construction, which should be conducted in such a way that plantings are not disturbed. Pre-planting of development sites would allow the vegetation to become established early enough to screen structures at the beginning of construction.
9. No improvements should be planned for the quarry supporting willow and cottonwood located immediately adjacent to the proposed Newhall south parcel residential development. This quarry possesses a value to wildlife unique among the quarries in LRRRA because it contains water much of the year. This quarry should be set aside as a nature preserve and be fenced and signed as necessary to protect the resource. Otherwise, quarries offer opportunities for development in disturbed areas of LRRRA without disturbing more natural habitat.
10. No structural facilities should be constructed in the chaparral and in the more open chaparral in order to protect habitat for the Alameda striped racer.
11. Campgrounds, amphitheatres, stables, or other major facilities should be developed along or near the periphery of LRRRA to minimize intrusion of such facilities into the center of the area and maintain the largest possible contiguous area of undisturbed wildlife habitat.

Cultural Resources

1. No special measures are necessary to protect the archaeologically significant site in LRRRA (CA-CCO-473) but no trails should be locat-

ed on the ridge. The site is presently well-protected because it is within a stand of dense chaparral, is not near any established trails, and its exact location is not publicly known.

Visual Resources

1. Facilities other than trails should not be planned for areas visible to the surrounding communities. Small-scale, low-maintenance facilities would be acceptable adjacent to Walnut Creek Municipal Golf Course.

Any facilities other than trails should be clustered as much as possible to minimize development area and visual impact on site.
2. Locations on LRRRA that provide excellent panoramic views are highly visible. Although these panoramic views are visually and aesthetically pleasing, placement of facilities other than trails should be avoided. However, the trail system planned for LRRRA should be designed to take advantage of these views. Some panoramic views are available from locations where trees could conceal picnic tables and placement of such small, screenable facilities at these locations would be beneficial.
3. Views of the quarries on LRRRA are unique, interesting, and dramatic. At the same time, they offer facility siting opportunities with minimal or no visibility from surrounding areas. Topographic reconfiguration (aside from slope or cliff stabilization) and pre-planting of screening vegetation should accompany any plan for quarry development where any view of the planned facilities would be possible (particularly for the major quarry facing the golf course).
4. Development should be assumed to occur in the Newhall south parcel and, other than connections with the trail system proposed on both the north and south parcels and to connect the south parcel with the Golf Course, no facilities should be planned in locations south of Ygnacio Valley Road from which the south parcel development would be visible. If however, development does not occur on the south parcel and it could be included in LRRRA, facilities should be considered on the parcel to take advantage of its physical features and location.
5. Unattractive close-up views of the Concord cable television facility, Contra Costa Water District Reservoir and Ygnacio Valley Road should be avoided.

6. Buckeye Canyon, Oak Meadow, and Paradise Valley provide extremely attractive areas with great potential for recreational facilities. Any facilities planned for these areas should be designed and situated to minimize the impacts on their visual qualities.

Roads and Trails

1. According to the Contra Costa County Consolidated Fire District, access into LRRRA shall be provided from public ways. The access ways shall be 16 feet in width at their entrance and a 12-foot minimum within LRRRA. The continued access and maintenance of the District's fire trail system shall be insured by the Lime Ridge Master Plan.
2. Roadways in LRRRA should be maintained in a condition that does not hinder all-weather access by maintenance and emergency vehicles.
3. Useless trails in LRRRA should be abandoned to protect users from getting lost or misdirected as well as to protect the environment. In particular, roadways which end in quarried areas should be barricaded and, if necessary, warning signs posted to reduce hazards.
4. No public through roads should be provided through LRRRA.
5. Existing trails should be extended and connected where necessary to provide access to portions of LRRRA with recreational potential.
6. Between 800 and 950 feet elevation the road on the west-facing slope to the Concord cable station is severely rutted and undergoing unacceptably accelerated erosion due to year-round daily use by maintenance and operations vehicles. This road section should be repaired to reduce the visual scar and, if possible, it should be closed and Fire Trail 11-14 should be used as the sole access to the television receiving station. In order to minimize maintenance costs to the City, the access road to the station should be paved or given a gravel base by Concord TV Cable. Also, the rutted sections of the road south from Ygnacio Valley Road (in Concord) to the television receiving station should be regraded and outsloped by Concord TV Cable.
7. New roads are not to extend any considerable distance into LRRRA, but if new sections of road are developed to replace the rutted and eroded section of the above-mentioned cable station access road, grades should not exceed 10 percent on Altamont clay and 8 percent on Briones loamy sands and soils of the Altamont-Fontana complex. Cut and

fill slopes should not exceed 2:1, grades should be rolled, or water-bars should be installed to reduce erosion.

8. Existing roads should be used wherever possible to provide hiking and equestrian access through LRRRA.
9. No new trails should be cut across slopes covered with chaparral.
10. To the extent possible, new trails should be aligned to minimize the visibility of cut slopes from surrounding residential areas. Benches gently sloping terrain, and existing vegetation (screening) should be used wherever possible to achieve this objective.
11. Trailways should comply with the width and grade standards used in the Shell Ridge Open Space area. According to the Trails Element of the General Plan, a dirt base is usually sufficient, although gravel is preferred along trails adjacent to neighborhoods. Slopes should vary and in no case should exceed 20 percent. Trails can be as narrow as two feet but sufficient width for two passing horses is preferable. Air clearance above trails should be a minimum ten feet to a width of eight feet. Trail surfaces should be clear of roots, and other obstacles, but should be disturbed as little as possible to prevent erosion. All materials used in the construction of guard rails, gates, bridges, rest places, etc. are to be made of native materials and rustic construction in order to enhance the safety, permanency, and natural appearance of the trails.
12. A loop trail offering opportunities for east-west and north-south travel through LRRRA is desired. Much of the trail system is already in place and provides the basis for establishing the loop. This loop is desired to provide recreational access to the ridges from both sides of the area (Concord and Walnut Creek) and to improve access for patrol but should not include the scarred section of the cable station access road.
13. The trail system established as part of the Master Plan should be designed to provide future opportunities for connections with the Galindo Open Space Corridor in Concord and Mt. Diablo State Park.

Utilities and Services

1. No utility extensions currently provide service to LRRRA. However, water, sewer, and storm drainage facilities exist in the roads surrounding LRRRA. Fire protection is provided by the Contra Costa County Consolidated Fire District. Police protection in LRRRA would

be provided by the police departments of the Cities of Concord and Walnut Creek.

2. Water lines exist along Ygnacio Valley Road and Valley Vista Road. However, LRRRA lies above the Contra Costa Water District's existing service zone. A new reservoir or a hydro-pneumatic pump station from an existing water line would be necessary to bring water into LRRRA. One possibility would be to extend water service to LRRRA improvements from the water tank proposed to serve the Newhall development.
3. LRRRA is in the Central Contra Costa Sanitary District's service area although no sewer lines extend into it. Restroom facilities in LRRRA should either be of a chemical or composting type or be served by septic tank with approvals by the County Health Department.
4. If plantings are made within the Pacific Gas & Electric Company power line and anchor easements, they should not exceed 15 feet in height. No structures exceeding this height should be planned. The existing grade along underground easements should not be altered.
5. Access to the cable TV station should be limited to Fire Trail 11-14 which extends southward from Ygnacio Valley Road between Turtle Creek Road and Cowell Road. This road should be maintained to permit safe all-weather access by Concord TV Cable maintenance and operations crews. Because the station would be a curiosity to LRRRA users and its facilities could prove dangerous to trespassers, activity areas should not be located in its vicinity. Concord TV Cable personnel and park rangers should work together to ensure that trespassing and vandalism of the station does not occur. Warning signs should be posted around the station.
6. Any structures placed in the LRRRA should be protected from fire with a nearby source of water and clearance of weeds, grass, and rubbish.
7. All natural open space areas must meet the Fire District's weed abatement standards. The U.S. Department of Agriculture's Land Management Program utilizing livestock grazing is recommended for LRRRA. This requires fencing the property and allowing animals to graze to approximately a 25% residual. If this method is not used, mechanical abatement is required. On grazed pasture, a 15-foot wide perimeter firebreak is required if the amount of grazing is sufficient to steadily reduce the grass height through the summer. A 30-foot wide perimeter firebreak and crossbreaks are required if grazing does not reduce the grass to three inches by the end of August. Where necessary, grass and weeds should be turned by discing or rototilling

enough to effectively stop the spread of fire. Where mowed, grass and weeds must be cut to a maximum height of three inches throughout the summer. Cut grass must be removed or mulched. All rubbish, trash, trimmings or litter shall be abated or otherwise removed from improved portions of LRRRA. All wood, fuel or lumber shall be neatly stacked or removed from the improved portions of LRRRA. All weeds, grass, or other combustible growth shall be cleared 30 feet around combustible storage. (Current grazing practices on LRRRA accomplish the required fuels reduction.)

8. Equestrians should not smoke in the saddle.
9. Park user rules and regulations enforced in other City open space areas shall apply to LRRRA. These rules limit the hours of park use, prohibit possession of weapons and illegal substances in the park, and prohibit all but official and emergency vehicles.

Existing and Possible Uses

1. The existing pistol range adjacent to the golf course has been abandoned from time to time because of problems with landslide debris. A potential alternative site is an area adjacent to and south of the golf course driving range. Development of any recreational facilities in the vicinity of this proposed pistol range must take into account safety requirements. The pistol range should be located away from trails and portions of LRRRA with high recreational and aesthetic potential. Placement in a relatively flat valley area or bowl would help to minimize sound generated by pistol practice.
2. A new water tank to provide water to the Newhall residential development along Ygnacio Valley Road is proposed in LRRRA at a site on a spur of Lower Lime Ridge at approximately 700 feet elevation. The tank would be buried and would not be visually recognizable. Existing trees and plantings around the margin would provide adequate screening.
3. Grazing will be continued on LRRRA. Recreational facilities would not interfere with grazing nor would grazing preclude recreational development.
4. Skeet and archery facilities, horse concessions, and permanent camping facilities are considered potential candidates for LRRRA.

5. Expansion of the Walnut Creek Municipal Golf Course to include the adjacent slopes of LRRRA is also considered a potential use. Such uses must be sited with due consideration of their visibility, given the goal of retaining an undeveloped, open landscape, and/or associated clearance requirements, given potential safety hazards.
6. Walnut Creek Municipal Golf Course is situated on City property adjacent to LRRRA. Not all of this City land has been developed and opportunities exist for recreational development in conjunction with development planned within LRRRA if the golf course is not expanded. Development of the dump site and the area north of the driving range, and extension of parking facilities at the golf course should be investigated as a way to accommodate Master Plan development.

REFERENCES

- Anthropological Studies Center, 1980. An Historic Archaeological Investigation of Limestone Quarrying Activities Along Lime Ridge, Contra Costa County, California.
- Baldrice, Michael J., 1979. An Archaeological Investigation of the Newhall N.W. Parcel (W.O. 8110).
- Bowerman, Mary, 1944. The Flowering Plants and Ferns of Mount Diablo, California. Their Distribution and Association into Plant Communities. The Gillick Press. Berkeley, California.
- City of Concord, 1976. Newhall Ranch Area Plan.
- City of Walnut Creek, 1971. General Plan (as amended through 1979).
- City of Walnut Creek, 1978. Operational Plan and Policy Guideline for the Walnut Creek Open Space.
- City of Walnut Creek, 1980. Newhall Northwest Parcel: Environmental Analysis of Development Options
- City of Walnut Creek, 1983. Walnut Creek Trailways (map).
- City of Walnut Creek, Community Development Department, 1983. Rancho Paraiso, Proposed Hillside Planned Development, Environmental Impact Report.
- Dibblee, Thomas W., Jr., 1980. Preliminary Geologic Map of the Clayton Quadrangle, Contra Costa County, California. U.S.G.S. Open File Reports #80-547 and 80-351.
- Earth Systems Consultants, 1979. Geotechnical Evaluation. Newhall Northwest Parcel.
- Emanuel, George, 1982. Ygnacio Valley, 1834-1970.
- Nilson, Tor H., 1975. Preliminary Map of Landslide and other Surficial Deposits of the Walnut Creek 7.5-minute quadrangle, Contra Costa County, California. U.S.G.S. Open File Reports #75-277-55 and 75-277-12.
- U.S. Soil Conservation Service, 1977. Soil Survey of Contra Costa County, California.

PERSONS CONTACTED

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Ron White, Walnut Creek Open Space

ATTACHMENT
COMMON PLANT SPECIES
LIME RIDGE REGIONAL RECREATION AREA

COMMON NAME

SCIENTIFIC NAME

Trees

California buckeye	<u>Aesculus californica</u>
Valley oak	<u>Quercus lobata</u>
Blue oak	<u>Quercus douglasii</u>
Coast live oak	<u>Quercus agrifolia</u>
California pepper tree	<u>Schinus molle</u>
Cottonwood	<u>Populus fremontii</u>
Yellow willow	<u>Salix lasiandra</u>
Almond	<u>Prunus amygdalus</u>

Shrubs

Chamise	<u>Adenostoma fasciculatum</u>
Black sage	<u>Salvia mellifera</u>
Poison oak	<u>Toxicodendron diversiloba</u>
Diablo manzanita	<u>Arctostaphylos auriculata</u>
Deerweed	<u>Lotus scoparius</u>
Coastal sage	<u>Artemisia californica</u>
Buckbrush	<u>Ceanothus cuneatus</u>
Coyote brush	<u>Baccharis pilularis</u> var. <u>consanguinea</u>
Cotoneaster	<u>Cotoneaster angustifolia</u>
Chaparral pea	<u>Pickeringia montana</u>
Toyon	<u>Heteromeles arbutifolia</u>
Yerba Santa	<u>Eriodictyon californicum</u>
Coffee berry	<u>Rhamnus californica</u>
Elderberry	<u>Sambucus caerulea</u>
Redberry	<u>Rhamnus crocea</u>
Bush monkey flower	<u>Mimulus aurantiacus</u>
Blackberry	<u>Rubus vitifolius</u>

COMMON NAME

SCIENTIFIC NAME

Grasses

Wild oats
Slender oats
Little rattlesnake grass
Soft chess
Red brome
Ripgut brome
Fescue
Perennial Italian ryegrass
Annual Italian ryegrass
California melicgrass
Foxtail grass
Rabbit'sfoot grass
Purple needlegrass
Bluegrass

Avena fatua
Avena barbata
Briza minor
Bromus mollis
Bromus rubens
Bromus rigidus
Festuca megalura
Lolium perenne
Lolium multiflorum
Melica californica
Hordeum spp.
Polypogon monspeliensis
Stipa pulchra
Poa scabrella

Forbs and Ferns

Blue-eyed grass
Red maids
Woodland star
Soap plant
Toothwort
Wild radish
Mustards
Buttercup
Dove weed
Plantain
Yellow star thistle
Purple star thistle
Milk thistle
Italian thistle
Artichoke thistle
Yarrow
Anise
Pearly everlasting
Belardia
Red-stemmed filaree
Grapestork's bill
Golden-backed fern

Sisyrinchium bellum
Calindrinia ciliata
Lithophragma affinis
Chlorogalum pomeridianum
Dentaria californica
Raphanus sativa
Brassica spp.
Ranunculus californicus
Eremocarpus setigerus
Plantago lanceolata
Centaurea solstitialis
Centaurea calcitrapa
Silybum marianum
Carduus pycnocephalus
Cynara cardunculus
Achillea millefolium
Foeniculum vulgare
Gnaphalium californicum
Belardia trixago
Erodium cicutarium
Erodium botrys
Pitoyrogramma triangularis

COMMON NAMESCIENTIFIC NAME

Maidenhair fern	<u>Adiantum jordani</u>
Shooting star	<u>Dodecatheon hendersonii</u>
Wild cucumber	<u>Marah fabaceus</u>
Scarlet pimpernel	<u>Anagalis arvensis</u>
Indian paintbrush	<u>Castilleja douglasii</u>
Chickweed	<u>Stellaria media</u>
Nightshade	<u>Solanum umbelliferum</u>
Owl's clover	<u>Orthocarpus spp.</u>
Sanicle	<u>Sanicula spp.</u>
Western dandelion	<u>Agoseris grandiflora</u>
Mugwort	<u>Artemisia douglasiana</u>
Common California aster	<u>Aster chilensis</u>
Tidy tips	<u>Lavina platygloea</u>
Common dandelion	<u>Taraxicum officinale</u>
Spiny clotbur	<u>Xanthium spinosum</u>
Spotted medick	<u>Medicago arabica</u>
Bur clover	<u>Medicago hispida</u>
Oregon vetch	<u>Vicia americana var. oregona</u>
Checker	<u>Sidalcea malvaeflora</u>
California poppy	<u>Eschscholzia californica</u>
Common plantain	<u>Plantago major</u>

The above species were identified on the basis of live and/or dead above-ground plant materials during the field reconnaissance conducted for the Resource Analysis. This list is certainly incomplete.

Additional species likely to occur on LRRRA are listed and described by Bowerman (1944) in her flora of Mount Diablo, and by the East Bay Regional Parks Department in the resource analyses prepared for Black Diamond Mines Regional Preserve (Adopted in 1977) and Wildcat Canyon/Tilden Regional Parks (Accepted in 1975).

APPENDIX B

PRELIMINARY MASTERPLAN
BASIC CONSTRUCTION COST ESTIMATES

**PRELIMINARY MASTERPLAN
BASIC CONSTRUCTION COST ESTIMATE
LIME RIDGE REGIONAL RECREATION AREA
DEVELOPMENT AREAS**

Item	Number	Unit	Unit Cost	Price	Total
1. LIME RIDGE QUARRY ACTIVITY AREA					
Lime Ridge Quarry Area					
Site preparation	87,000	sf	0.15	13,050	
Drainage			allow	45,000	
Grading			allow	12,000	
A/C paving, 12 ft wide to P/L	6,000	sf	1.80	10,800	
A/C parking lot	5,000	sf	1.80	9,000	
D.G. parking	4,000	sf	1.50	6,000	
Control gates	2	ea	800	1,600	
W/hold. tank chem RR	1	ea	allow	5,000	
Elect. line to P/L	700	lf	allow	10,000	
Water line to P/L	700	lf	allow	7,000	
Field irrigation	47,000	sf	.50	23,500	
Turf field	47,000	sf	.50	23,500	
Five-gallon trees	30	ea	45	1,350	
Rim safety fence and signage	2,000	lf	12	24,000	161,800
Picnic Area					
Site preparation	55,000	sf	0.15	8,250	
Rough turf field	31,000	sf	0.35	10,850	
Picnic tables	6	ea	1000	6,000	
Five-gallon trees	30	ea	45	1,350	26,450
			SUBTOTAL		218,250
			10% contingency		21,825
			TOTAL		240,075

Item	Number	Unit	Unit Cost	Price	Total
2. OAK MEADOW ACTIVITY AREA					
Site preparation	80,000	sf	0.15	12,000	
Grading			allow	10,000	
Drainage			allow	5,000	
Access road, 12 ft wide to P/L	16,800	lf	1.80	30,200	
A/C parking lot	5,000	sf	1.80	9,000	
Control gates	2	ea	800	1,600	
W/hold. tank chem RR	1	pr	allow	5,000	
Shelter	1	ea	allow	30,000	
Elect. line	1,600	lf	allow	15,000	
Water line	1,600	lf	allow	10,000	
Field irrigation	54,000	sf	.50	27,000	
Field turf	54,000	sf	.50	27,000	
Five-gallon trees	30	ea	45	1,350	
			SUBTOTAL		190,650
			10% contingency		19,050
			TOTAL		209,700
3. BUCKEYE CANYON ACTIVITY AREA					
Site preparation	49,000	sf	.15	7,350	
Multi-use area	24,000	sf	.35	8,400	
D.G. paving	6,000	sf	1.50	9,000	
W/hold. tank chem RR	1	pr	1200	1,200	
Shelter	1	ea	allow	20,000	
			SUBTOTAL		45,900
			10% contingency		4,600
			TOTAL		50,550

Item	Number	Unit	Unit Cost	Price	Total
4. PARADISE VALLEY ACTIVITY AREA					
(Development to be determined in the future; cost to be determined)					
5. PARKING EXPANSION/EQUESTRIAN STAGING AREA					
Site preparation	50,000	sf	.15	7,500	
Grading			allow	20,000	
Drainage			allow	12,000	
Concrete curb	1,300	lf	8	10,400	
A/C paving	28,000	sf	1.80	50,400	
G.C. planting	21,000	sf	.85	17,850	
Irrigation	21,000	sf	1.20	25,200	
Fencing	400	lf	10	4,000	
Trees	50	ea	45	2,250	
			SUBTOTAL		149,600
			10% contingency		15,000
			TOTAL		164,600
Not included in costs:					
road improvements					
private property acquisition costs					
lighting					
6. MISCELLANEOUS PICNIC AND REST AREAS					
Picnic/rest area	3	ea	15,000	45,000	
			SUBTOTAL		45,000
			10% contingency		4,500
			TOTAL		49,500
7. TRAILS					
LRRRA hiking and equestrian	9.375	mi	20,000	187,500	

Item	Number	Unit	Unit Cost	Price	Total
PDOS hiking and equestrian	.140	mi	20,000	(by others)	
LRRRA hiking	.960	mi	20,000	19,200	
PDOS hiking	.057	mi	20,000	(by others)	
LRRRA pedestrian and biking	.680	mi	80,000	54,400	
PDOS pedestrian and biking	1.875	mi	80,000	(by others)	
				SUBTOTAL	261,100
				10% contingency	26,100
				TOTAL	287,200

PRELIMINARY MASTERPLAN
BASIC CONSTRUCTION COST ESTIMATE
CITY OF WALNUT CREEK
DEVELOPMENT AREAS

Item	Number	Unit	Unit Cost	Price	Total
1. PISTOL RANGE AMPHITHEATER ACTIVITY AREA					
Multi-use Field/Aphitheatre Area					
Site preparation	72,000	sf	0.15	10,800	
Grading			allow	15,000	
Drainage			allow	5,000	
D.G. paving	8,000	sf	1.50	12,000	
Stairs and path	300	lf	allow	15,000	
Amphitheater	8,000	sf	allow	80,000	
Elect. line to road	400	lf	allow	4,000	
Water line to road	300	lf	allow	1,200	
Field irrigation	23,000	sf	0.50	11,500	
Turf field	23,000	sf	0.50	11,500	
Five-gallon trees	75	ea	45	3,400	
W/hold. tank chem RR	1	pr	allow	5,000	
			SUBTOTAL		174,400
			10% contingency		17,400
			TOTAL		191,800
Parking/Picnic Area					
Demolition			allow	5,000	
Site preparation	69,000	sf	0.15	10,350	
Grading			allow	6,000	
Drainage			allow	5,000	
A/C paving	18,000	sf	1.80	32,400	
D.G. paving	2,000	sf	1.50	3,000	
Picnic tables	5	ea	1000	5,000	
Fencing at rim bank	350	lf	12	4,200	

Item	Number	Unit	Unit Cost	Price	Total
Elect. line	400	lf	allow	4,000	
Water line	400	lf	allow	2,000	
Field irrigation	25,000	sf	0.50	12,500	
Turf field	25,000	sf	0.50	12,500	
Five-gallon trees	50	ea	45	2,250	
W/hold. tank chem RR	1	pr	allow	5,000	
			SUBTOTAL		109,200
			10% contingency		10,900
			TOTAL		120,100
Golf Course Parking Expansion Area					
Site preparation	65,000	sf	0.15	9,750	
Grading			allow	18,000	
Drainage			allow	15,000	
A/C paving	23,000	sf	1.80	41,400	
Lighting			allow	10,000	
Golf ball screen	300	lf	20	6,000	
Irrigation	42,000	sf	0.50	21,000	
Planting area	42,000	sf	0.50	21,000	
Five-gallon trees	40	ea	45	1,800	
			SUBTOTAL		143,950
			10% contingency		14,400
			TOTAL		158,400
Picnic Area					
Site preparation	52,000	sf	0.15	7,800	
Grading	40,000	sf	0.15	6,000	
Planting area	40,000	sf	0.35	14,000	
Trees	30	ea	45	1,350	
Picnic tables	8	ea	1000	8,000	
			SUBTOTAL		37,150
			10% contingency		3,700
			TOTAL		40,900

2. ACCESS ROAD

Site preparation	16,000	sf	0.15	2,400
Grading			allow	5,000
Drainage			allow	3,000
A/C paving	12,600	sf	1.80	22,700
Control gates	2	ea	1000	2,000
Water line, LRRRA P/L- Valley Vista	1,900	lf	allow	12,000
Elect. line, LRRRA P/L- Valley Vista	1,900	lf	allow	19,000
			SUBTOTAL	65,700
			10% contingency	6,600
			TOTAL	72,300

3. TRAILS

Hiking	.34	mi	20,000	6,800
8-ft pedestrian biking trail	.21	mi	80,000	16,800
			SUBTOTAL	23,600
			10% contingency	2,400
			TOTAL	26,000

PRELIMINARY MASTERPLAN
SUMMARY CONSTRUCTION COST ESTIMATE
LIME RIDGE REGIONAL RECREATION AREA
LRRRA DEVELOPMENT AREAS

1.	LIME RIDGE QUARRY ACTIVITY AREA	\$240,075
2.	OAK MEADOW ACTIVITY AREA	209,700
3.	BUCKEYE CANYON ACTIVITY AREA	50,500
4.	PARADISE VALLEY ACTIVITY AREA (TO BE DETERMINED)	
5.	PARKING EXPANSION/EQUESTRIAN STAGING AREA	164,600
6.	MISCELLANEOUS PICNIC/REST STOPS	49,500
7.	TRAILS	287,200
	SUBTOTAL	1,001,775
	15% contingency	150,300
	TOTAL	1,152,075

PRELIMINARY MASTERPLAN
SUMMARY CONSTRUCTION COST ESTIMATE
LIME RIDGE REGIONAL RECREATION AREA
CITY OF WALNUT CREEK DEVELOPMENT AREAS

1.	PISTOL RANGE AMPHITHEATER ACTIVITY AREA	
	MULTI-USE FIELD AMPHITHEATER	\$191,000
	PARKING/PICNIC AREA	120,000
	GOLF COURSE PARKING EXPANSION AREA	158,400
	PICNIC AREA	40,900
2.	ACCESS ROAD	72,300
3.	TRAILS	26,000
	SUBTOTAL	609,500
	15% contingency	91,400
	TOTAL	700,900

TOTAL MASTERPLAN SUBTOTAL 1,852,975
20% contingency 370,600*

TOTAL MASTERPLAN 2,223,570

*Undesignated site development construction planning contingencies (ie. providing water service, drainage construction, revegetation, etc.)