RIVERSIDE COUNTY FLOOD CONTROL
AND WATER CONSERVATION DISTRICT
RIVERSIDE, CALIFORNIA

HOMELAND

MASTER DRAINAGE PLAN

Zone 4

Original Plan – May 1982
Revision No.1 – March 2006

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HOMELAND
MASTER DRAINAGE PLAN
Revision No. 1

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Master Drainage Plan Map ..... Inside Back Cover

SECTION I – PURPOSE

The purpose of this report is to investigate and evaluate the drainage problems of the Homeland area and to develop an economical drainage plan that provides flood protection for both existing and future development. Presently, this area is served by a report entitled "Master Drainage Plan for the Homeland Area", prepared by the Riverside County Flood Control and Water Conservation District (District) in May 1982. The report presented here is a re-evaluation and expansion of the 1982 report and is meant to replace it. This revision to the Master Plan, prepared in cooperation with Albert A. Webb and Associates, was necessitated by development needs of property owners east of the 215 freeway in the Homeland/Romoland area. In general the cost of this plan increased from the previous plan but this revision was found to maximize the orderly development of the area.

The Homeland area is located along State Highway 74 about midway between the cities of Hemet and Perris. The Master Drainage Plan is bounded roughly by a divide in the Lakeview Mountains, the Double Butte Hills and Briggs Road. State Highway 74 traverses the southern portion of the watershed from west to east while Juniper Flats Road is the major north - south thoroughfare.

The plan presented herein will provide adequate flood protection to the community when implemented and will serve as a guide for the long term construction scheduling of the primary drainage facilities. The plan will also act as a planning guide for the location and sizing of local drainage facilities to be constructed by developers and others within the area.

It should be noted by the reader that the cover of this report clearly states it is a master plan, and therefore, should be read and used with this in mind. Simply stated, this plan is an overview; a study of the drainage problems that exist in a specific geographical area, and a conceptual solution to those problems. As stated elsewhere in this report, the selection of the facilities presented in this plan is based on engineering and economic considerations and is by no means the only solution.

The alignment and location of the facilities proposed in this Master Drainage Plan are general; precise facility locations will be dictated by conditions and other factors existing at the time of design. Similarly, the sizing information shown on the enclosed map is preliminary. A more detailed analysis performed at the design stage will determine final sizing.

SECTION II – SCOPE

The drainage area covered by this plan is approximately 6.6 square miles in size. The terrain ranges from the rugged slopes of the Lakeview Mountains to the mildly sloping valley area lying between the Lakeview Mountains and the Double Butte Hills. The extent of the studies establishing this master plan includes:

1. Determination of the quantity and points of concentration of storm runoff in the area.

2. Determination of the location and size of the proposed drainage structures.

3. Investigation of alternate routes and methods as a basis for selecting the most economical and engineering sound plan.

4. Preparation of a drainage facility map.

5. Preparation of preliminary plans and profiles, and supporting cost estimates.

SECTION III - GENERAL DISCUSSION

This report provides a Master Drainage Plan for the Homeland area. The Plan consists of two detention basins, collector levees and a series of underground storm drains and open channels. The proposed system will collect and safely convey storm runoff through the developing community.

The facilities proposed in this Plan are intended primarily to collect and control storm flows emanating from the Homeland area and local foothills and convey them safely through the lower valley area outletting them into the San Jacinto River. Drainage to the west of this plan is discussed in a report prepared by the District entitled, "Romoland Master Drainage Plan", dated March 2006.

At present, during periods of runoff, flood waters, silt and other debris emanating from the mountains and hills surrounding the area impact the developing community, causing property damage and leaving roads and highways impassable. (The Federal Insurance Administration shows a large flood plain impacting the Homeland area; see **Figure 1**). Continued development of the area will only serve to worsen the situation and necessitate a greater need for flood protection.

The Master Drainage Plan presented herein provides an economical and developable plan for collecting and conveying storm runoff through the study area. The proposed drainage structures will also provide an outlet for local drainage facilities built by developers and others as growth occurs in the area. When completed, the facilities will provide the area with improved drainage and protection from the once in 100 year flood.

All underground storm drains proposed in this plan are intended to collect local urban runoff and, with few exceptions, are located in either existing or assumed future street rights of way. Runoff from a 10-year frequency storm is assumed to be conveyed in the streets until flow depths reach the top of the curb. Once it reaches the top of the curb, the plan proposes the initiation of a 10-year or 100-year underground drain. Where a 10-year drain is proposed, the difference between the 100-year storm runoff and 10-year storm runoff will be conveyed within the street right of way until flow exceeds the right of way line, at which time a 100-year facility is initiated.

Open channels are proposed when the discharge is large and the construction and right of way costs for a channel prove to be less than the cost of an underground storm drain. Where open channels are provided, they are designed to carry the runoff from a 100-year frequency storm.

The detention basins proposed in this Plan are intended for the purpose of peak flow reduction. This is accomplished by the use of temporary storage to reduce fairly high inflow rates to substantially lower outflow rates. The peak reduction process allows the use of smaller and, therefore, less costly facilities downstream of the detention basin.

The alignments of all channels and underground storm drains are based on hydraulic efficiency, engineering judgment, and economics.

SECTION IV – HYDROLOGY

The hydrology for the Plan was developed by two methods: the Modified Rational Method and the Synthetic Unit Hydrograph Method. The Modified Rational Method was used to determine the peak discharges generated from small watersheds (generally less than 300 to 500 acres in size). The Synthetic Unit Hydrograph Method was used for larger areas in generating the peak discharge rates for sizing major drainage facilities and for the routing of the proposed detention basins. Methodology and supportive data for the rational and synthetic hydrology can be found in the "Riverside County Flood Control and Water Conservation District Hydrology Manual", dated April 1978.

Facilities not revised by this revision were based on the 1982 assumed land use found in this report (**Figure 2**). In general, facilities revised as part of this Master Drainage Plan revision were analyzed with new hydrology based on the projected land use found in the County of Riverside 2003 General Plan or Riverside County Integrated Project (RCIP), infiltration assumptions from the District's Hydrology Manual and point rainfall values derived from District rain gauge information. To account for the attenuating effects of channel storage and basin storage the Convex Routing Method and Modified Puls Methods were used respectively. Drainage boundaries were determined using the District's topography with 4-foot contour accuracy.

SECTION V – EXISTING FACILITIES

Currently, the District does not operate or maintain any flood control facilities within the study area, with the exception of Homeland MDP Line 2 (project number 4-0337, drawing number 4-748) and Homeland Sultanas Road Storm Drain (project number 4-0338, drawing number 4-787). These facilities have, as much as possible, been incorporated into the proposed drainage system (see MDP map).

Briggs Channel

This concrete channel was built in 1966 by the developer of Tract 3529. It lies on the East Side of Briggs Road, extending from Mapes Road to Alicante Drive. The 4 foot wide, 3foot deep channel has adequate capacity to pass the anticipated 100 year peak flow. Downstream of Alicante Drive the alignment of this channel is proposed to be continued by Line lC.

Line lB

The upper end of Line lB (from Alicante Drive to 330 feet south) is an existing 4 foot wide, 3 foot deep, concrete, trapezoidal channel. It was constructed in conjunction with Tract 4388 in the early 1970's.

Leon Channel

This trapezoidal channel is aligned along the west side of Leon Road south of State Highway 74. The channel, which was built by the developer of Tract 4519 serves as the downstream terminus for Line 3. This plan proposes no modification to this facility or its outlet.

Golf Course Channel

The golf course lying south of State Highway 74, between Leon Road and Sultanas Road also provides storm water conveyance during periods of runoff. The course was designed and built as part

of Tract 4519 with the dual use concept in mind. This plan proposes no change to the golf course with one minor exception. The outlet structure of Line 2 will necessitate the construction of about 500 feet of a small daylighting channel through the course. This low flow outlet channel will only replace the existing shallow concrete v-ditch that currently exists.

Under current conditions, it is expected that the golf course would experience a 100-year peak flow rate of about 3200-cfs. With the completion of the proposed master plan facilities, especially Line 1, this rate will be reduced to about 1100-cfs.

Sultanas Road Storm Drain

This reinforced concrete pipe is aligned along Sultanas Road north of Watson Road. This facility (project number 4-0-00338) was built by the developer of Tract 27448-2, as shown on drawing number 4-787, and conveys the 100-year tributary flows toward Line 1.

Line 2

This 42" HDPE was designed by the District to convey the maximum flow possible given the grade and outlet constraints. These parameters limited the discharge to 80-cfs. The start of the project is at the intersection of Fretwell Avenue and Leon Road. The storm drain heads in the northwest direction following the streets: Fretwell Avenue, Naumann Avenue, McWade Avenue and Homeland Avenue. The project ends at a detention basin between Guthridge Lane and Homeland Avenue.

Other Storm Drains

There are two major storm drain lines that were built in conjunction with Tract 4519. They are shown on the enclosed MDP map. This plan does not affect these two lines except for the fact that construction of Line 1 will significantly reduce the flow tributary to each.

SECTION VI - RECOMMENDED IMPROVEMENTS

The recommended improvements discussed briefly below are shown on the enclosed MDP map found at the back of this report. Supporting data for all proposed facilities is available at the Riverside County Flood Control and Water Conservation District office. Preliminary size information as well as design flow rates are shown on the enclosed MDP map as well as on the preliminary plan and profile plates.

Before any design is undertaken it should be noted that during preparation of preliminary plan and profile drawings, a detailed utility search was not completed. This means that, while most major known facilities were dealt with, a more thorough search may discover utilities that will necessitate minor alignment or size changes, or utility relocation.

OPEN CHANNELS

The open channels proposed in this plan consist of two types, lined and unlined. In general, a lined channel is a trapezoidal shaped facility with concrete paving on the sides and bottom. The sides slope upward from the bottom at a rate of one foot vertically for every 1.5 feet horizontally. Some lined facilities in this Plan are rectangular where the side of the channel are vertical. The lined channels in this Plan range in size from a bottom width of 4 feet to 10 feet and in depth from 4 feet to 7 feet.

UNDERGROUND STORM DRAINS

The proposed underground storm drains generally consist of reinforced concrete pipe ranging in size from 27 inches to 102 inches in diameter or reinforced concrete boxes that are usually placed under dedicated road crossings or where the flow rates or hydraulic necessities exceed the capacity of standard pipe sizes. The underground storm drains proposed within this revision consist of pre-cast reinforced concrete pipe and reinforced concrete box.

DETENTION BASINS

The purpose of the detention basins proposed in this Plan is, by the use of temporary storage, to reduce fairly high inflow rates to substantially lesser outflow rates. This peak reduction allows the use of smaller and thus less costly downstream facilities. It should be pointed out that the detention basins proposed in this plan are designed for 10 or 100-year frequency storms. Flows exceeding the design capacity of the basin would pass through the emergency spillway in flow patterns approximating present conditions.

GROUNDWATER

In 1980, surfacing groundwater became a problem in the area between Melba Avenue and Naumann Avenue near Highway 74. Groundwater problems, including surface and near-surface flows of water, have caused septic tanks to malfunction and overflow, street pavements to fail and building foundations to be threatened. In the Homeland area these problems have manifested themselves in the area roughly bounded by Melba Avenue, Wakefield Avenue, Naumann Avenue, and State Highway 74.

The causes of the high groundwater are diverse. Heavy rains result in significant surface runoff, much of which infiltrate into the alluvial soils in the area, thus raising the water table. Effluent from septic tanks has further contributed to the problem.

The solution to the problem is beyond the scope of this master plan; however, implementation of the Plan may alleviate, to some degree, future groundwater problems by virtue of the drainage system's ability to carry flows out of the area before significant infiltration can take place.

MAJOR REVISIONS

This section describes some of the major revisions to the previously adopted Homeland Master Drainage Plan. Revisions may include alignment changes, facility types and sizes, and/or flow-rate adjustments.

Juniper Flats and Briggs Basin

Two earthen detention basins are added by this proposed revision. The Juniper Flats Basin is proposed at Juniper Flats Road and Watson Road. This basin has approximately 130 acre-feet of storage capacity and reduces the peak inflow of 1816 cfs to an outflow of 493 cfs. The area required for this basin is approximately 28 acres.

The Briggs Road Basin is proposed at Briggs Road approximately 1300 feet south of Highway 74. The proposed basin would have approximately 400 acre-feet of storage capacity and reduces the inflow from 3418 cfs to an outflow of 640 cfs. The area required for this basin is approximately 40 acres.

Line 1
This facility has been completely realigned and redesigned to account for the addition of the Juniper Flats basin immediately upstream of this facility, which has decreased the flow rate anticipated from that area. The alignment has changed to lie adjacent to Watson Road. This facility has been revised from a concrete-lined channel to a combination of underground storm drain and a smaller concrete lined channel, for equivalent portions. Exceptions will be made for concrete lined channels at road crossings where reinforced concrete box culverts are proposed. Facilities draining to this mainline facility have been shortened accordingly to account for the realignment of this facility (e.g. Lines 1A, 1B and 1C). The previously adopted upstream portions of this facility have been eliminated to accommodate the addition of the Juniper Flats Basin.

Line 4
The previously adopted downstream portions of this facility have been replaced by the addition of the Briggs Road Basin, where this facility will drain.

SECTION VII - ALTERNATIVES

Several alternatives were developed and studied during the generation of this revision to the Homeland Master Drainage Plan. These alternatives considered different alignment schemes for the major storm drains and open channels; sizing of the proposed detention basins; and various hydraulic considerations. As the study progressed, alternatives considered for the main facilities proposed in this Plan were presented to the District management and staff. General concurrence with the plan selected was obtained based on cost differentials, accessibility to collector drains, right-of-way restrictions, and ease of construction.

SECTION VIII – ESTIMATED COST

A cost summary for the Master Drainage Plan facilities is shown in **TABLE 1 "Cost Summary"**. Cost were based on the 2005 Planning Unit Cost sheets and include construction, right of way and 34% for engineering, environmental mitigation, administration and contingencies.

The cost of the drains shown in **TABLE 1** includes manholes and catch basins in addition to the cost of the pipe installed. Manholes are located as necessary with a maximum spacing of 500 feet. Catch basins are not specifically located but the total number of lineal feet is computed and costed.

SECTION IX - CONCLUSIONS

Based on the studies and investigations made for this report it is concluded that:

1. The Homeland area has experienced serious flooding problems in the past. As this area continues to develop, these damages are expected to increase. A more orderly growth pattern can safely occur with the construction of these proposed facilities.

2. A drainage system is required to safely convey storm runoff through the area with the least interruption to public services. The Master Drainage Plan presented in this report is such a system and is the most economical of the alternatives studied.

3. The proposed Plan lends itself to staged construction as funds become available.

4. The total cost of the recommended improvements, including right of way, engineering, contingencies, and administration is estimated to be **$30,429,471**.

SECTION X - RECOMMENDATIONS

It is recommended that:

1. The Master Drainage Plan as set forth herein be approved by the Riverside County Flood Control and Water Conservation District's Board of Supervisors as part of the overall master plan for the County.

2. The Master Drainage Plan as set forth herein be used as a guide for all future developments in the study area and that such developments be required to conform to the plan insofar as possible.

3. The right of way required for the plan be protected from encroachment.

TABLE 1

HOMELAND MASTER DRAINAGE PLAN
COST SUMMARY

FACILITIES	CONSTRUCTION*	RIGHT OF WAY	TOTAL COST
Line 1	$7,022,600.00	$580,000.00	$7,602,600.00
Line 1-A	$757,505.00	$0.00	$757,505.00
Line 1-B	$245,549.00	$120,000.00	$365,549.00
Line 1-C	$199,676.00	$75,000.00	$274,676.00
Line 2	$3,828,169.00	$101,000.00	$3,929,169.00
Line 2-A	$104,365.00	$0.00	$104,365.00
Line 2-B	$111,858.00	$0.00	$111,858.00
Line 2-C	$653,100.00	$0.00	$653,100.00
Line 2-Ca	$158,864.00	$0.00	$158,864.00
Line 2-D	$82,774.00	$0.00	$82,774.00
Line 3	$229,540.00	$0.00	$229,540.00
Line 4	$612,012.00	$420,000.00	$1,032,012.00
Briggs Road Basin	$4,297,734.00	$4,000,000.00	$8,297,734.00
Juniper Flats Basin	$3,544,589.00	$2,800,000.00	$6,344,589.00
Melba Basin	$265,136.00	$220,000.00	$485,136.00
TOTAL	**$22,113,471.00**	**$8,316,000.00**	**$30,429,471.00**

* Includes 34% for Engineering, Administration, MSHCP fee and Contingencies

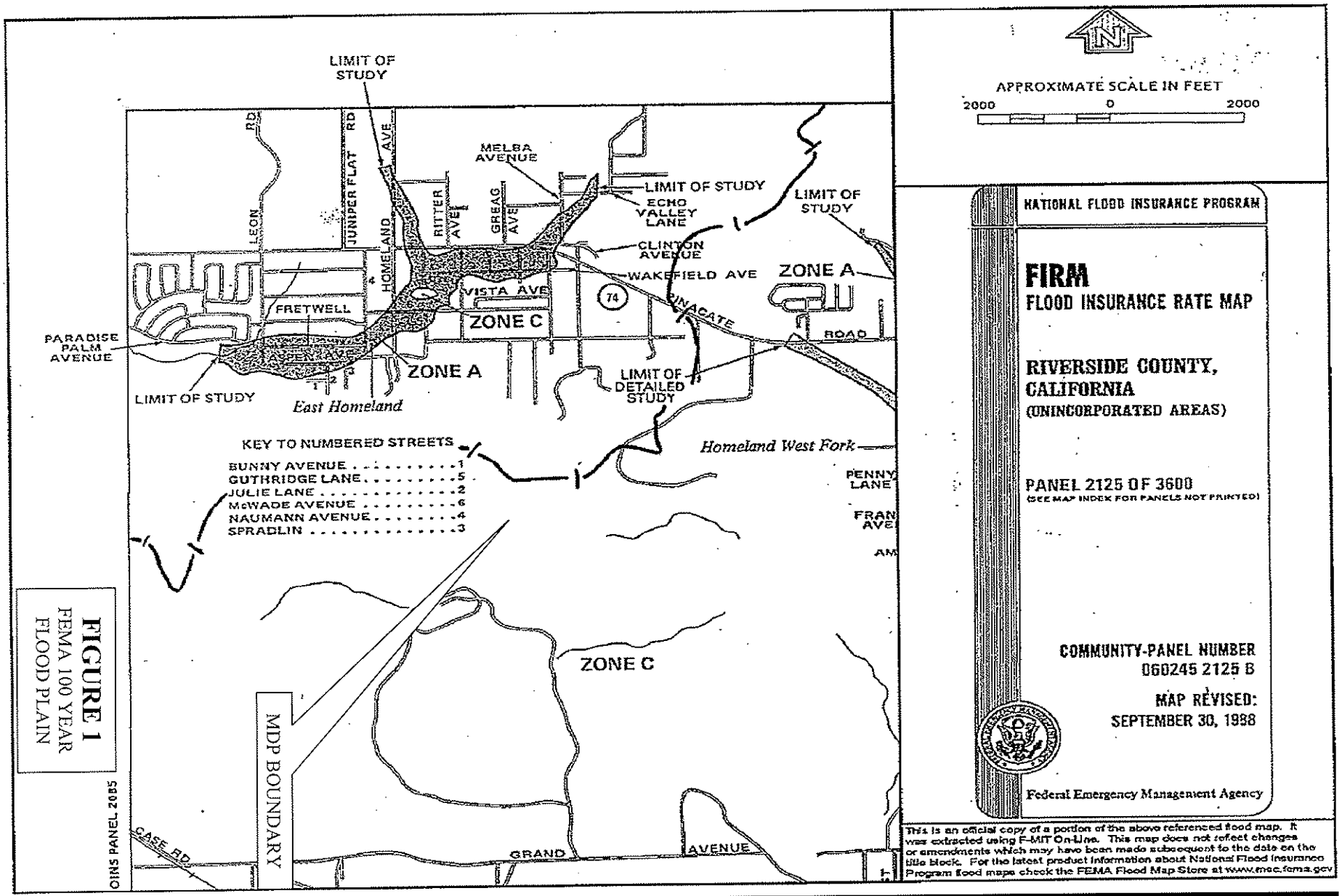


FIGURE 1
FEMA 100 YEAR
FLOOD PLAIN

OINS PANEL 2085

102690

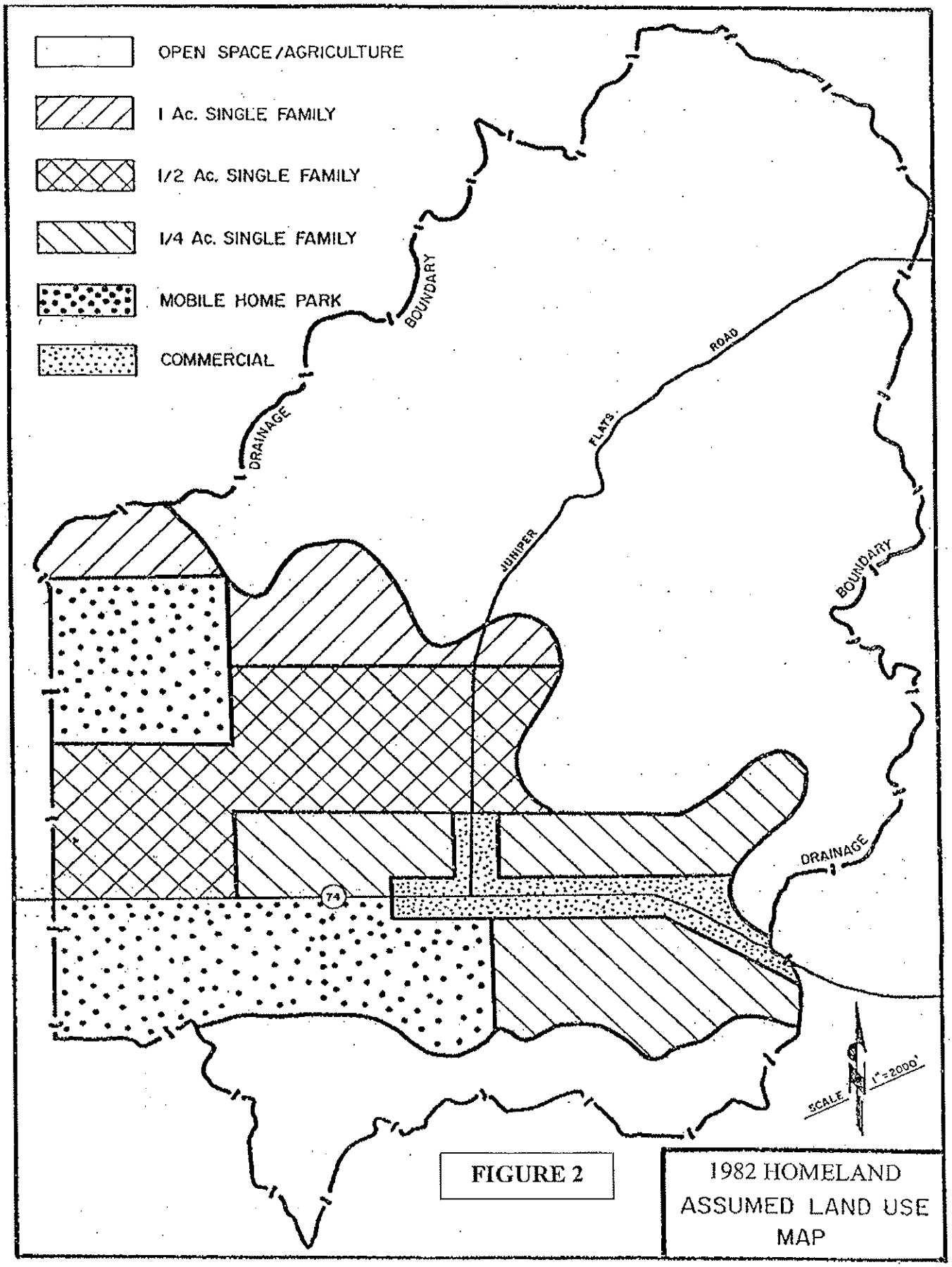
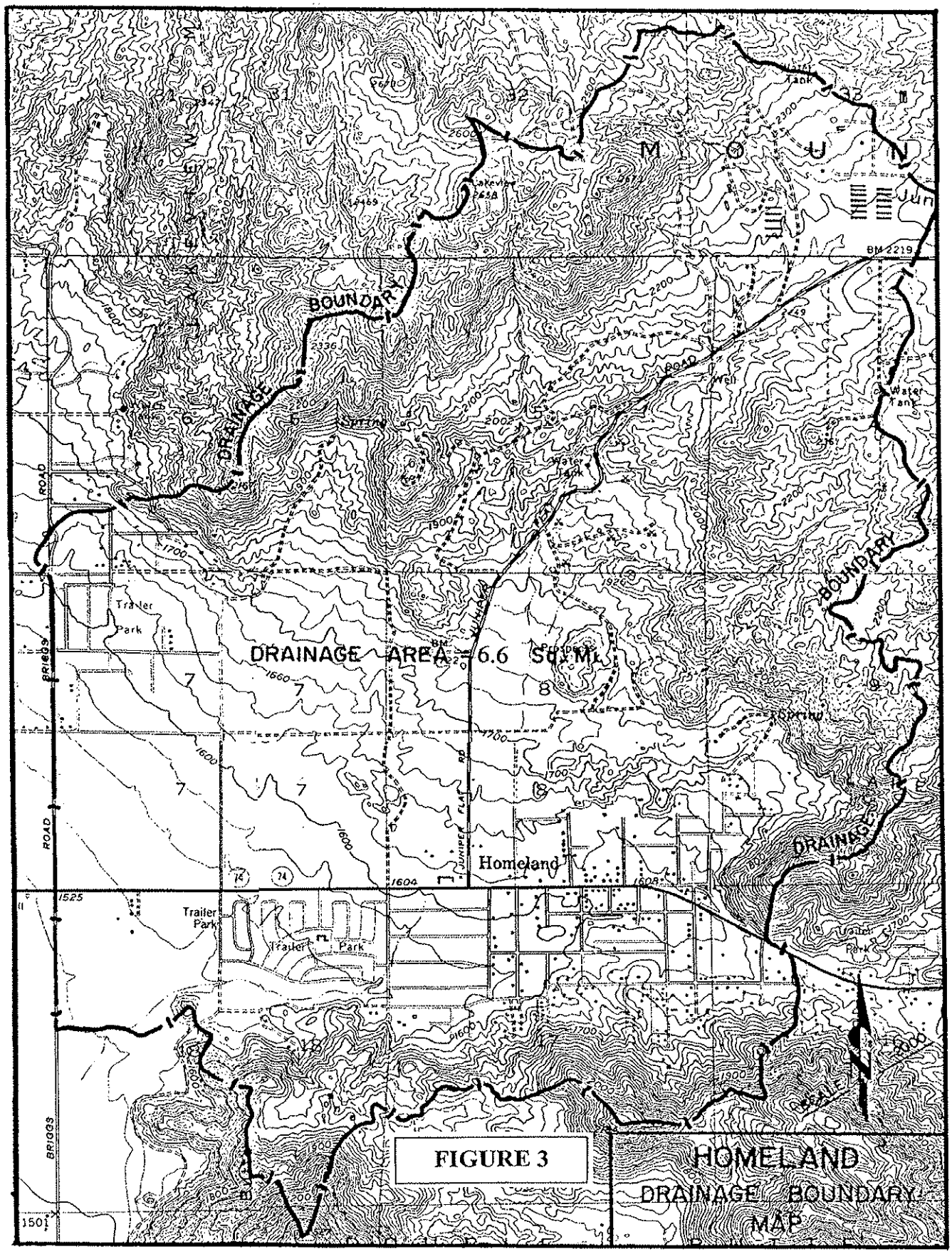
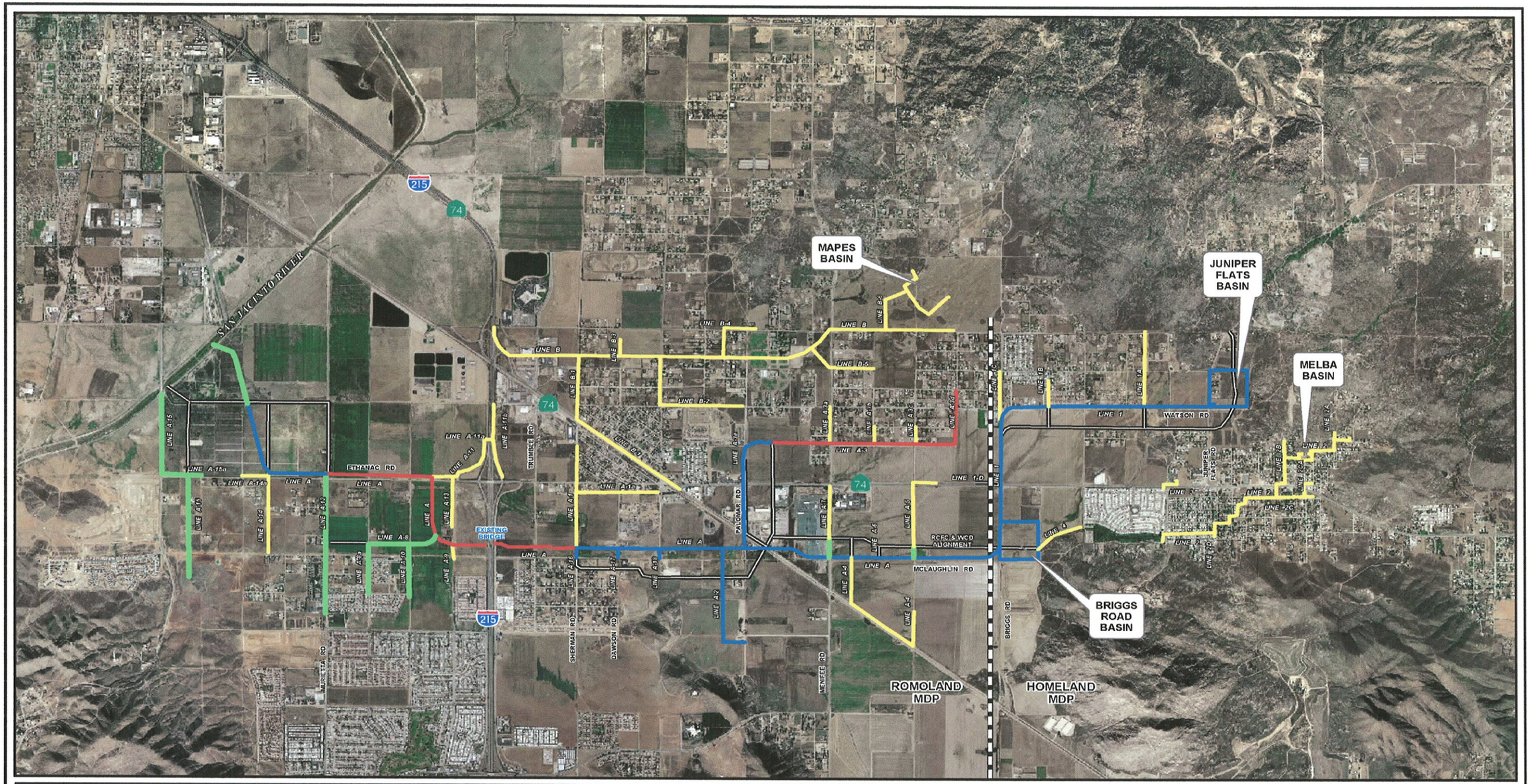


FIGURE 2

1982 HOMELAND ASSUMED LAND USE MAP


DRAINAGE AREA = 6.6 Sq. Mi.
BOUNDARY
DRAINAGE
Homeland
Trailer Park
BRIGGS ROAD
JUNIPER FLAT RD
Water Tank
Well
Spring
BM 2219
FIGURE 3
HOMELAND
DRAINAGE BOUNDARY
MAP



Source: AirPhoto USA
February 2004

ALBERT A. WEBB ASSOCIATES
ENGINEERING CONSULTANTS

N
W E
S

0 3,000 6,000 Feet

LEGEND

- PHASE I - PROPOSED REVISIONS
- PHASE I - PREVIOUSLY ADOPTED
- FUTURE FACILITIES - PROPOSED REVISIONS
- FUTURE FACILITIES - PREVIOUSLY ADOPTED
- PREVIOUSLY ADOPTED, TO BE ELIMINATED

Figure 4

MDP's - Adopted and Revised

Romoland / Homeland MDP/ADP

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