Annual Engineer's Report - 2003

Yolo County Flood Control & Water Conservation District

Woodland, California

December 2003

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3301 C Street, Bldg 100-B
Sacramento, CA 95816
Tel: 916.341.7760
Fax: 916.341.7767

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HAND DELIVERED

December 31, 2003

Mr. Tim O'Halloran, General Manager
Yolo County Flood Control & Water
Conservation District
34274 State Highway 16
Woodland, California 95695

Dear Mr. O'Halloran:

Subject: Yolo County Flood Control & Water Conservation District (8108.001) – Annual Engineer's Report (2003)

Enclosed is the Annual Engineer's Report for 2003, which was prepared by Wood Rodgers, Inc., for the Yolo County Flood Control & Water Conservation District (District). This report summarizes the District's overall groundwater situation.

The report addresses efforts of the District in 2003, in which Wood Rodgers was involved relative to implementing the District's Water Management Plan. Comments are also made in relation to the recommendations presented in the Engineer's Report for 2002.

Wood Rodgers appreciates the opportunity to participate in the District's water resources program.

Respectfully submitted,

Francis E. Borcalli, P.E.

Enclosure (12)

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I. INTRODUCTION

This Annual Engineer's Report, prepared by Wood Rodgers, Inc., summarizes the groundwater situation within the Yolo County Flood Control & Water Conservation District (District) in 2003, generally, and addresses Action Items from the District's Water Management Plan, in which Wood Rodgers was involved. The report concludes with recommendations aimed at advancing water management efforts in Yolo County.

It is important to note that the District is involved in other water-related activities, which are extensive in scope; however, these activities are not addressed in this report.

II. GROUNDWATER SITUATION

Data from the District's monitoring of groundwater levels in Yolo County in the spring and fall of each year are transmitted to the California Department of Water Resources (DWR) for compilation into DWR's database. DWR's database includes data from the District, the U.S. Bureau of Reclamation (USBR), as well as from wells monitored by DWR.

Shown on Map 1 is the location of wells represented in DWR's database, which includes the wells monitored by the District.

Water level data obtained along Cache Creek, as part of the Cache Creek Resources Management Program, the cities of Woodland and Davis, the University of California at Davis (UCD), and the reclamation districts, are not now incorporated into DWR's database. The inclusion of this data would enhance the overall program. This should be accomplished through the District's AB 303 Groundwater Monitoring Program, which is addressed later in this report.

A. Groundwater Level Hydrographs

The District compiled average groundwater-level data for groups of wells to represent geographic areas within the District for the years 2002 and 2003. This information shows no significant difference in water levels from the spring and fall readings for the two years.

Additionally, for evaluation as part of this report, selected wells are used as "index" wells to represent the behavior of groundwater levels in various areas of the District. The location of the respective wells is shown on Map 1. Presented on Figure 1 through Figure 5 are water level hydrographs for the "index" wells.

In view of the interest in Capay Valley regarding the impact of water use by the Cache Creek Casino, data from two wells in that area have been included in this report. These include Well No. 10N/03W-02R02 and Well No. 10N/02W-07A01.

Data from these wells provide a reasonable baseline condition in that the period of data is approximately 15 and 40 years, respectively. The water level in Well No. 10N/03W-02R02 appears to respond immediately to dry year conditions judging from the behavior from 1987 to 1993. Well No. 10N/02W-07A01 is relatively close to Cache Creek and appears, based upon the response in 1991, to respond to the presence of water in Cache Creek. In 1991, the District made no water releases from Clear Lake or Indian Valley.

Observations from data representing other "index" wells show groundwater levels in the Hungry Hollow area and southwest of Woodland to be near Spring 2002 levels; however, recovery is lagging in other areas as the levels are approximately 10 feet lower than the high level reported in Spring 1998, which was an exceptionally wet season.

B. Groundwater Contours

Changes in spring water levels need to be reviewed somewhat cautiously as the apparent groundwater behavior can be influenced by relative wetness or dryness and the time at which pumping for irrigation begins.

Groundwater contours are used to represent general groundwater elevations and direction of flow. Since the number and distribution of monitoring wells is greatest for those wells monitored on a semiannual basis, this data is used to develop general groundwater contour maps. Accordingly, a groundwater contour map was prepared for Spring 2003. This information is presented on Map 2.

Groundwater levels and gradients for Spring 2003 are similar to historic patterns with no apparent anomalies.

C. Change in Groundwater Levels

Presented on Map 3 are contours showing the change in groundwater levels from Spring 2002 to Spring 2003. This approach is used to identify differences that otherwise would not be readily apparent from the seasonal contour maps alone. As shown on Map 3, there was a significant change in water level in the Plainfield Ridge area. Closer examination of some of the data shows some anomalies that warrant review to confirm the validity of the data.

D. Summary

In summary, the groundwater situation within the District continues to be good with respect to groundwater levels subject to the validity of the data in the Plainfield Ridge area. The spring levels tend to be lower than that experienced in Winter/Spring 1998, although this period was exceptionally wet.

III. WATER MANAGEMENT RELATED ACTIVITIES

A. Water Management Plan Implementation

The District adopted its Water Management Plan in October 2000. In 2002, notable effort has been expended to implement specific Action Items. As noted previously, only work in which Wood Rodgers has been involved is discussed in this report. The District worked on implementing other Action Items; however, they are not addressed herein.

1. Action Item D. - Surface Water Monitoring

   To document surface water leaving the District, the District has continued its cooperative effort with the U.S. Geological Survey to monitor flow on Willow Slough and the Willow Slough Bypass. Data from these gages indicate that from April through the first week of November, a total of 11,500 acre-feet of water flowed from the District, which is comparable to the 12,000 acre-feet reported in 2002

   As noted in previous annual reports, the composition of the water flowing is most probably irrigation return flow derived from a combination of applied surface water delivered by the District, applied groundwater to which the District has entitlement, and applied groundwater to which overlying lands have entitlement.

2. Action Item E. - Groundwater Monitoring

   The District was successful in obtaining grant funding under AB 303, the Local Groundwater Assistance Fund. The District's application for grant funding is entitled, "A Design and Implementation of Groundwater Monitoring Program and Data Management System." This program is underway with considerable effort made, as intended in the application, to be a countywide program. As it now appears, the geographic scope of the program will include the District with

participation from Reclamation District No. 108, Reclamation District No. 737, and the Dunnigan Water District.

Within the District, the groundwater monitoring network would be enhanced to include additional data for wells along Cache Creek, the cities of Woodland, Davis, and Winters, the University of Davis (UCD), and the Cache Creek Casino.

Some difficulties are being confronted with respect to use and publishing groundwater quality data from DWR and the Department of Public Health Services. There is an issue regarding confidentiality that needs to be dealt with.

Similarly, from comments received at program coordinating meetings the owners of individual wells may be reluctant to dedicate their wells for groundwater quality monitoring for fear of what may be required if contamination has occurred. This concern may either limit the extent of the monitoring network or limit the extent of constituents to test.

In January 2004, the District will initiate communications with owners of wells presently within the District's groundwater level monitoring network to request their participation in groundwater quality monitoring. The overall success or extent of the groundwater monitoring network would then be determined.

The first round of water quality sampling is planned for March 2004, as part of this program. The work under this AB 303 grant is to be completed in June 2004.

3. Action Item I. - District-Yolo-Zamora In-Lieu Recharge Project

In cooperation with landowners within the south portion of the Yolo-Zamora Water District, the District completed a feasibility study for of a conjunctive water use program. Four alternatives for delivering surface water to the area were evaluated. Two alternatives were based upon utilizing the District's existing supplies, the third

alternative was based upon diverting "winter" water, and the fourth alternative considered diverting "winter" water from the Colusa Basin Drain to store for irrigation the following summer. Each alternative was deemed infeasible due to costs and limited benefits.

An important work product that was derived from the feasibility study includes the refinement and calibration of DWR's Lower Colusa Basin Integrated Groundwater Surface Model (LCBIGSM). This work was performed by WRIME. The groundwater model was selected to evaluate the impact of conjunctive water use in the study area with the understanding that in the future it could be expanded for portions or all of Yolo County.

Wood Rodgers developed an operations model for the District's Cache Creek system using the Danish Hydraulic Institute's MIKE BASIN model. The model was developed to characterize the system's water supply for the hydrologic period 1922-2002. To address environmental considerations along Cache Creek, the Natural Heritage Institute performed a preliminary assessment of hydrologic, hydraulic, and environmental resources and concepts for resources management along Cache Creek. This work represents a discussion document for future activities involving Cache Creek.

It is noted that although the alternatives evaluated were not feasible for a conjunctive water use project for agriculture in the Yolo-Zamora Water District, there may be an opportunity for similar projects associated with environmental enhancement and municipal water supplies.

IV. RECOMMENDATIONS

The Annual Engineer's Report - 2001, identified certain items that warranted attention to enhance the overall database to manage water resources within the District and Yolo County as well. Those items were reiterated in the Annual Engineer's Report – 2002, as Wood Rodgers viewed them important to continue. These items are reiterated below with comments relating to the status of each item.

1. Requesting the county, cities, reclamation districts, and other entities gathering groundwater levels/elevations on a regular basis, to have the respective data compiled as part of DWR's groundwater database for Yolo County.

   Comment: This is being accomplished for an expanded area as part of the District's AB 303 program.

2. Investigating the prospects of having DWR's land use program coordinated as an integral part of the District's and/or county's water management program for the regular and timely availability of land and water use data.

   Comment: This remains to be done.

3. Monitoring selected index wells in the central and northern portions of the District on a monthly basis.

   Comment: This should be a part of the monitoring program developed under the District's AB 303 program.

4. Establishing a collaborative effort with other agencies to provide an efficient and effective means of compiling and disseminating resource data.

Comment: This will be addressed for groundwater data as part of the District's AB 303 program.

Additionally, Wood Rodgers recommends the District's consideration of implementing Action Item L, "Water Management and Operations Report," from the October 2000 Water Plan.

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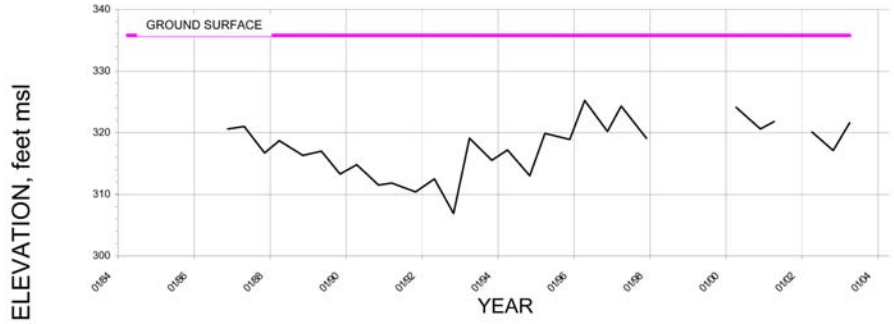
Figures

Figures

YOLO COUNTY FLOOD CONTROL &
WATER CONSERVATION DISTRICT

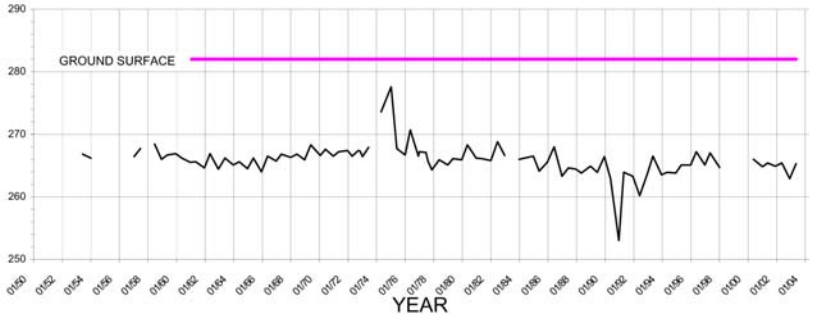
WATER LEVEL HYDROGRAPHS

WELL NO. 10N/03W-02R02



GROUNDWATER ELEVATION, feet msl

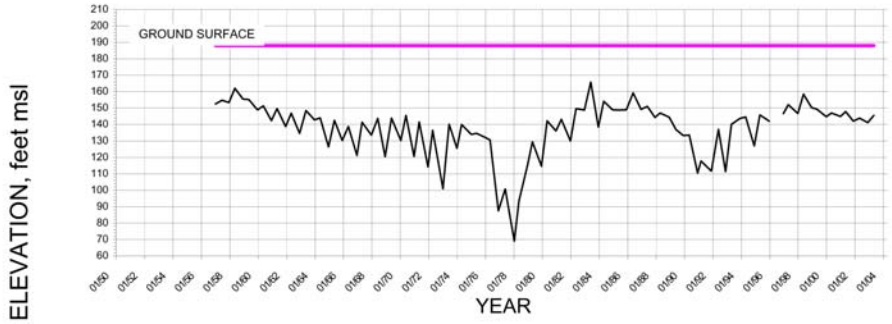
WELL NO. 10N/02W-07A01



YOLO COUNTY FLOOD CONTROL &
WATER CONSERVATION DISTRICT

WATER LEVEL HYDROGRAPHS

WELL NO. 10N/01W-05E01



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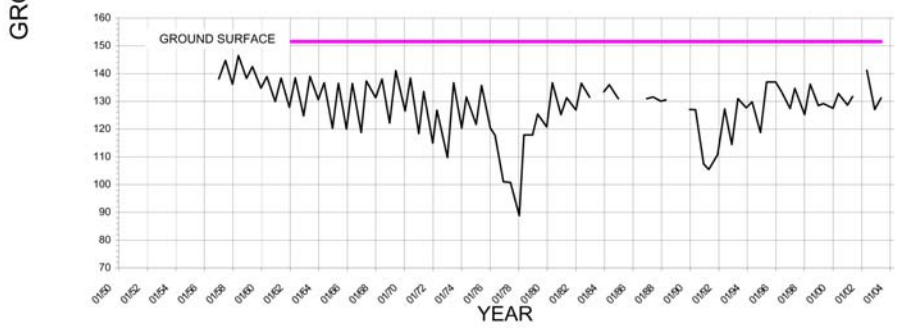


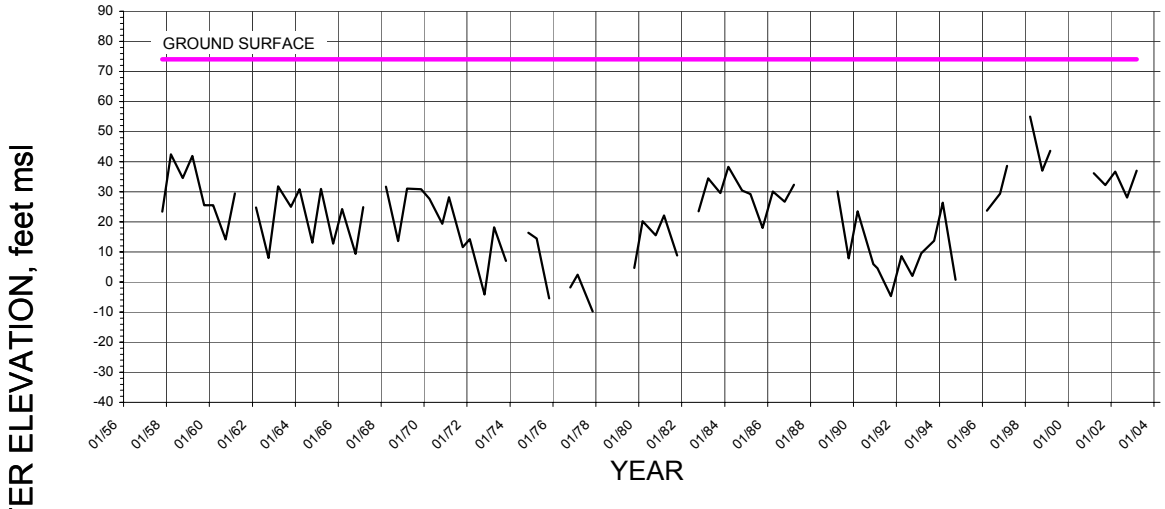
12/31/03

FIGURE 2

YOLO COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT

WATER LEVEL HYDROGRAPHS

WELL NO. 10N/02E-18M01



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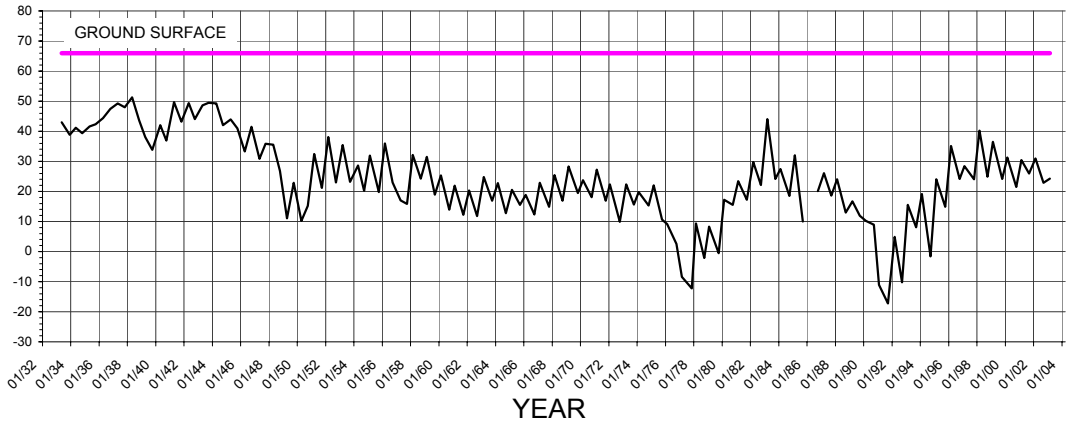
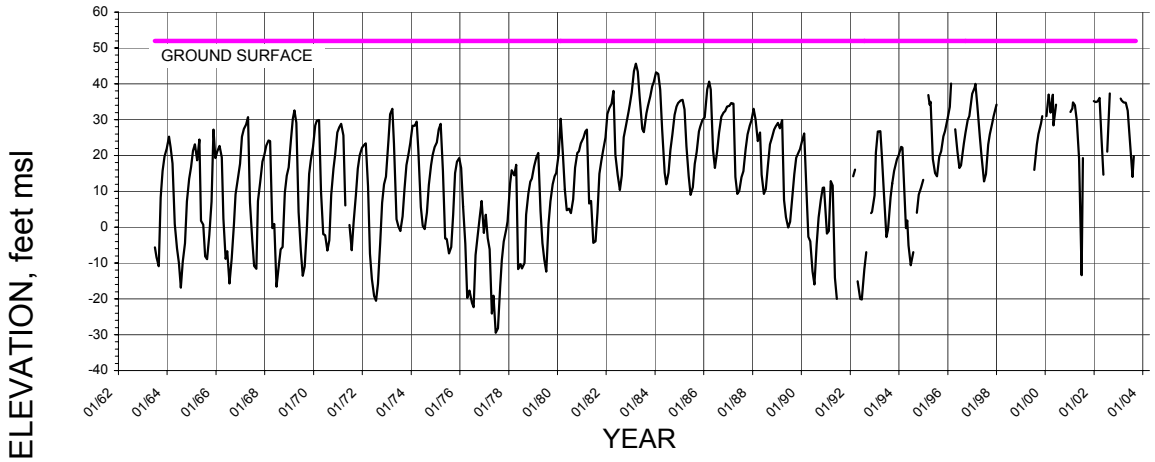


YOLO COUNTY FLOOD CONTROL &
WATER CONSERVATION DISTRICT

WATER LEVEL HYDROGRAPHS

WELL NO. 09N/02E-16N01



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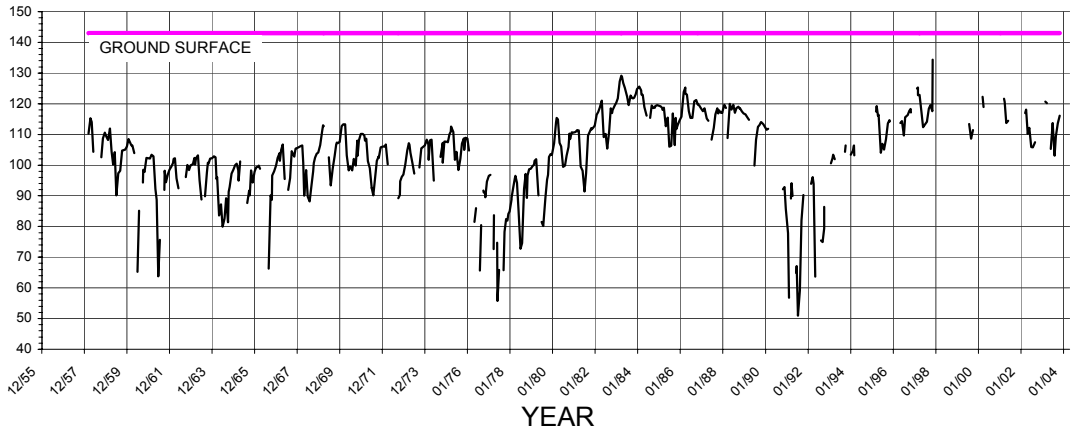

YOLO COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT

WATER LEVEL HYDROGRAPHS

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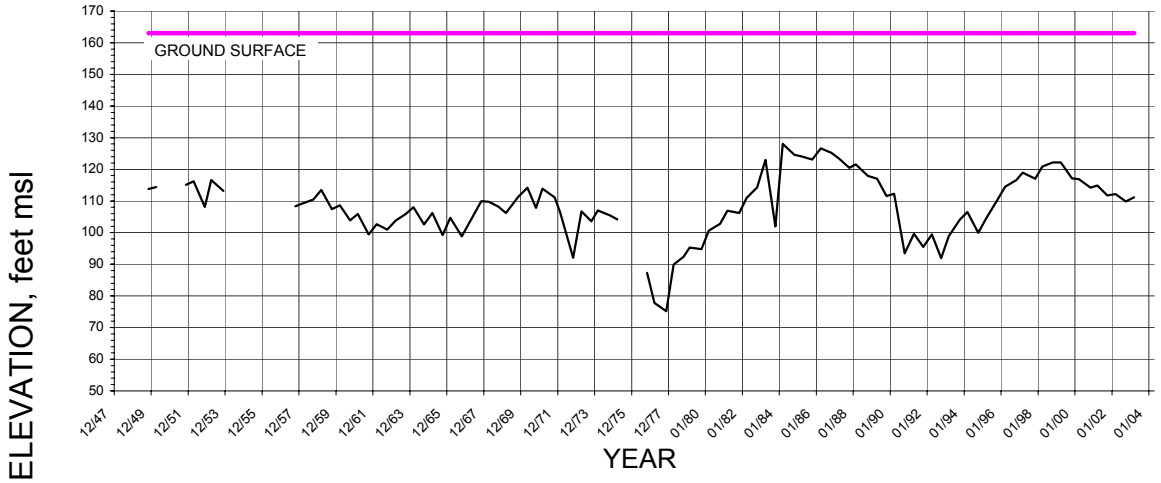

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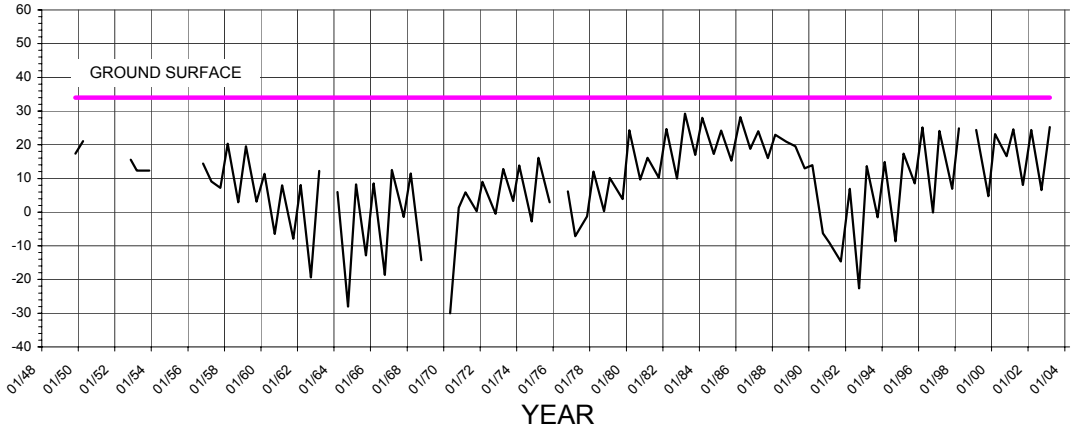

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Maps

Maps

LEGEND

- Waterways/Creeks
- Canals
- City/Town
- Groundwater Monitoring Wells - Semiannual Monitoring
- Groundwater Monitoring Wells - Monthly Monitoring
- 08N/01E-23C01 Well Number
- Groundwater Monitoring Well With Hydrograph in Report

N

0 10,000 20,000

SCALE IN FEET

YOLO COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT

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WELL LOCATION MAP

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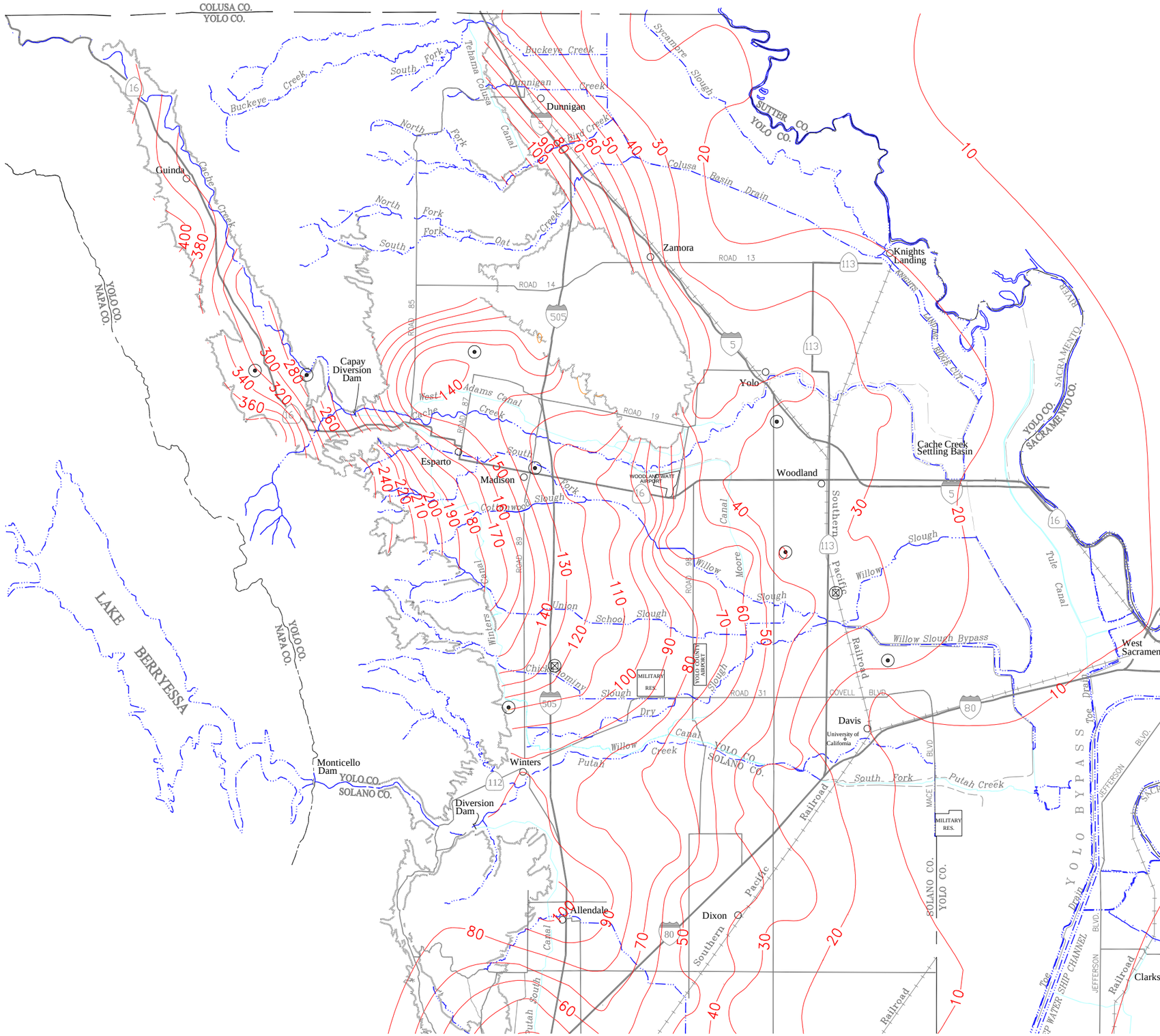
MAP 1

J:\Jobs\8108-YCFC_WCD\ENGINEERS RPT 2003\wells2003.dwg 5/14/04 9:27am jbuchanan



LEGEND

- Waterways/Creeks
- Canals
- 20 — Lines of Equal Groundwater Elevation
- ○ City/Town
- ⊙ Groundwater Monitoring Wells - Semiannual Monitoring With Hydrograph in Report
- ⊗ Groundwater Monitoring Wells - Monthly Monitoring With Hydrograph in Report

Note: Some data in the Plainfield Ridge area should be examined for reasonableness.

N

0 10,000 20,000

SCALE IN FEET

PRELIMINARY

YOLO COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT

ANNUAL ENGINEER'S REPORT - 2003

GROUNDWATER CONTOURS - SPRING 2003

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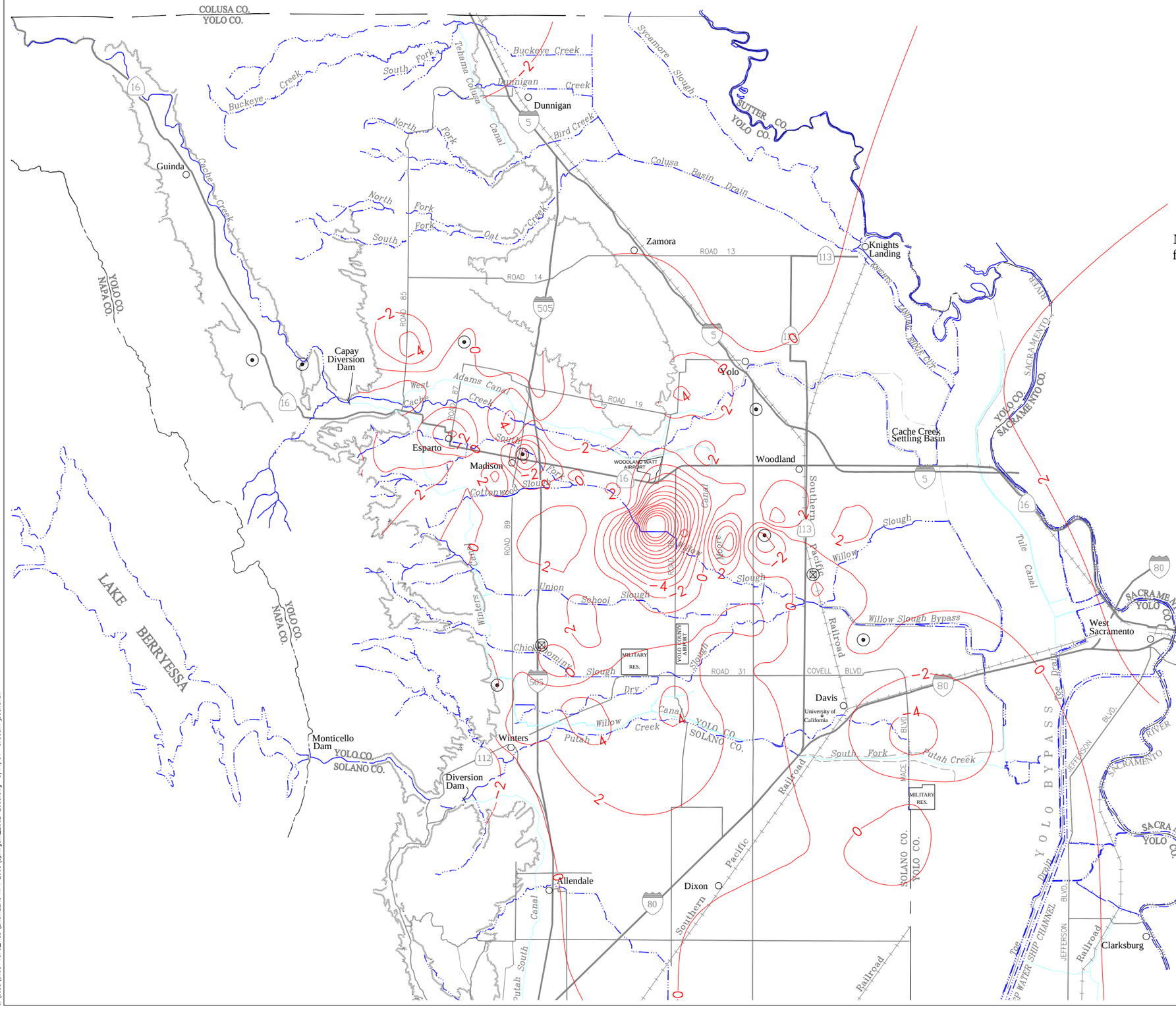
MAP 2

J:\Jobs\8108--YCFC...WCD\ENGINEERS RPT 2003\Spring2003.dwg 5/14/04 9:29am jbuchanan



LEGEND

- Waterways/Creeks
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0 10,000 20,000

SCALE IN FEET

PRELIMINARY

YOLO COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT

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SPRING 2002 TO SPRING 2003 CHANGE IN GROUNDWATER LEVELS

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J:\Jobs\8108~YCFC_WCD\ENGINEERS RPT 2003\Springdiff_2002-2003.dwg 5/14/04 9:30am jbuchanan

MAP 3