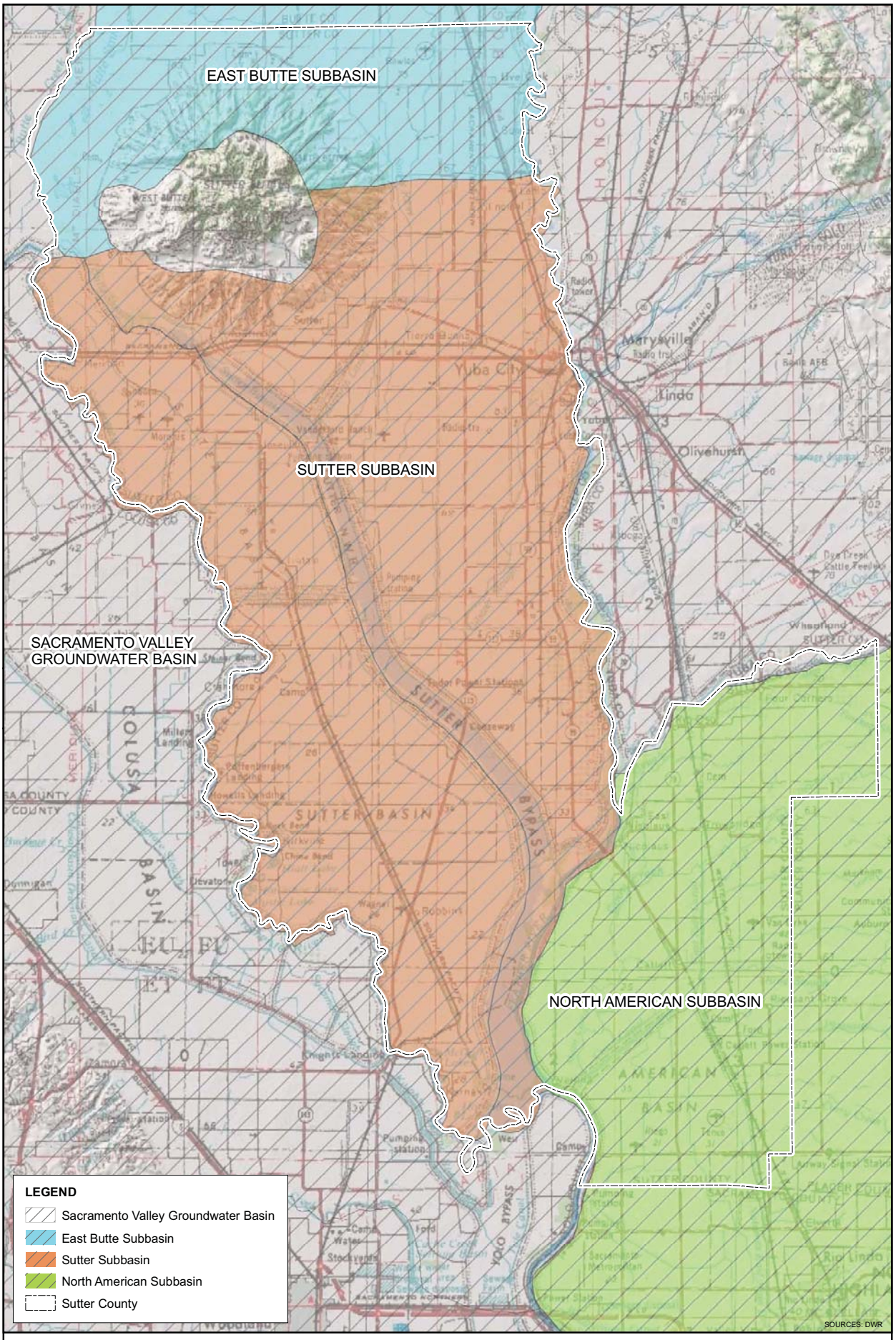

FIGURE 1
GROUNDWATER BASIN AND SUBBASINS
SUTTER COUNTY GROUNDWATER MANAGEMENT PLAN
FEBRUARY 2012

NORTH
0 1.5 3
MILES

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J:\Jobs\8337_SutterCounty\GIS\Tasks\20120201 Final Draft Figure Comments\Figure 1 Groundwater Subbasins.mxd 2/7/2012 12:50:01 PM bdemucha

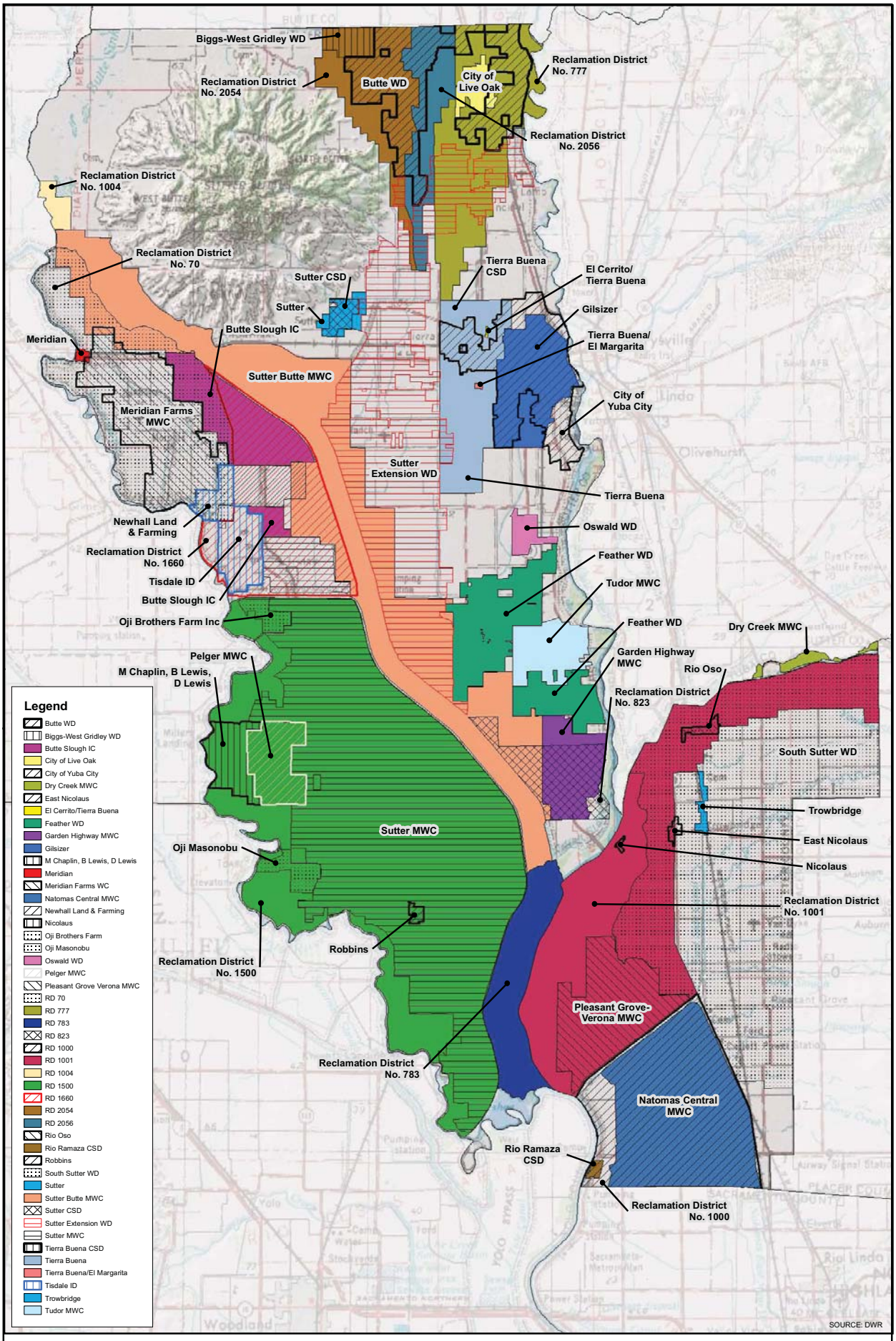

FIGURE 2
WATER DISTRICTS, PURVEYORS, AND WATER COMPANIES
SUTTER COUNTY GROUNDWATER MANAGEMENT PLAN
FEBRUARY 2012

NORTH
0 1.5 3
MILES

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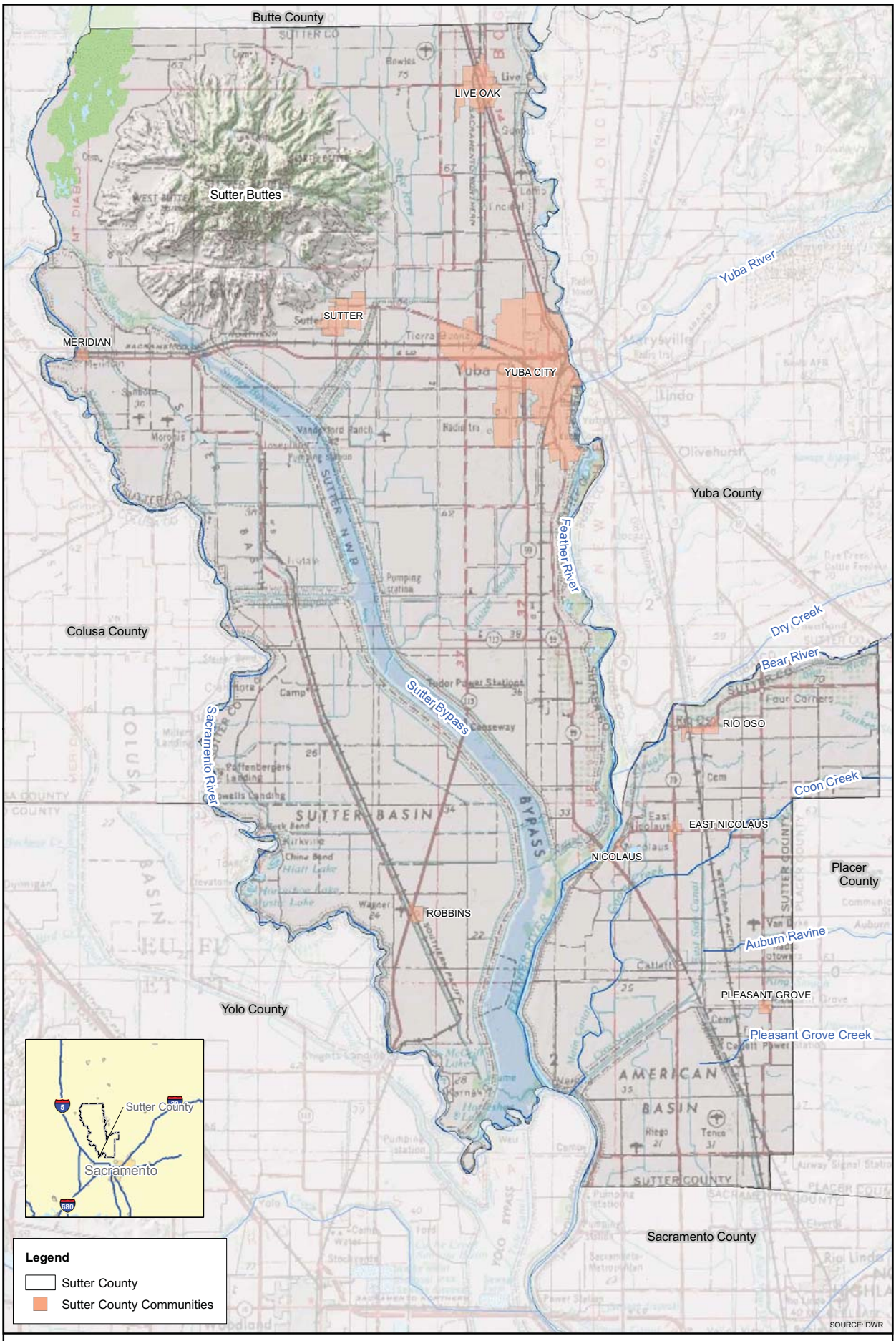

FIGURE 5
PHYSICAL FEATURES
SUTTER COUNTY GROUNDWATER MANAGEMENT PLAN
FEBRUARY 2012

NORTH

0 1.5 3
MILES

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J:\Jobs\8337_SutterCounty\GIS\Tasks\20120116 Final Draft\Figure 5 Sutter County Physical Features.mxd 2/7/2012 12:47:54 PM bdemucha

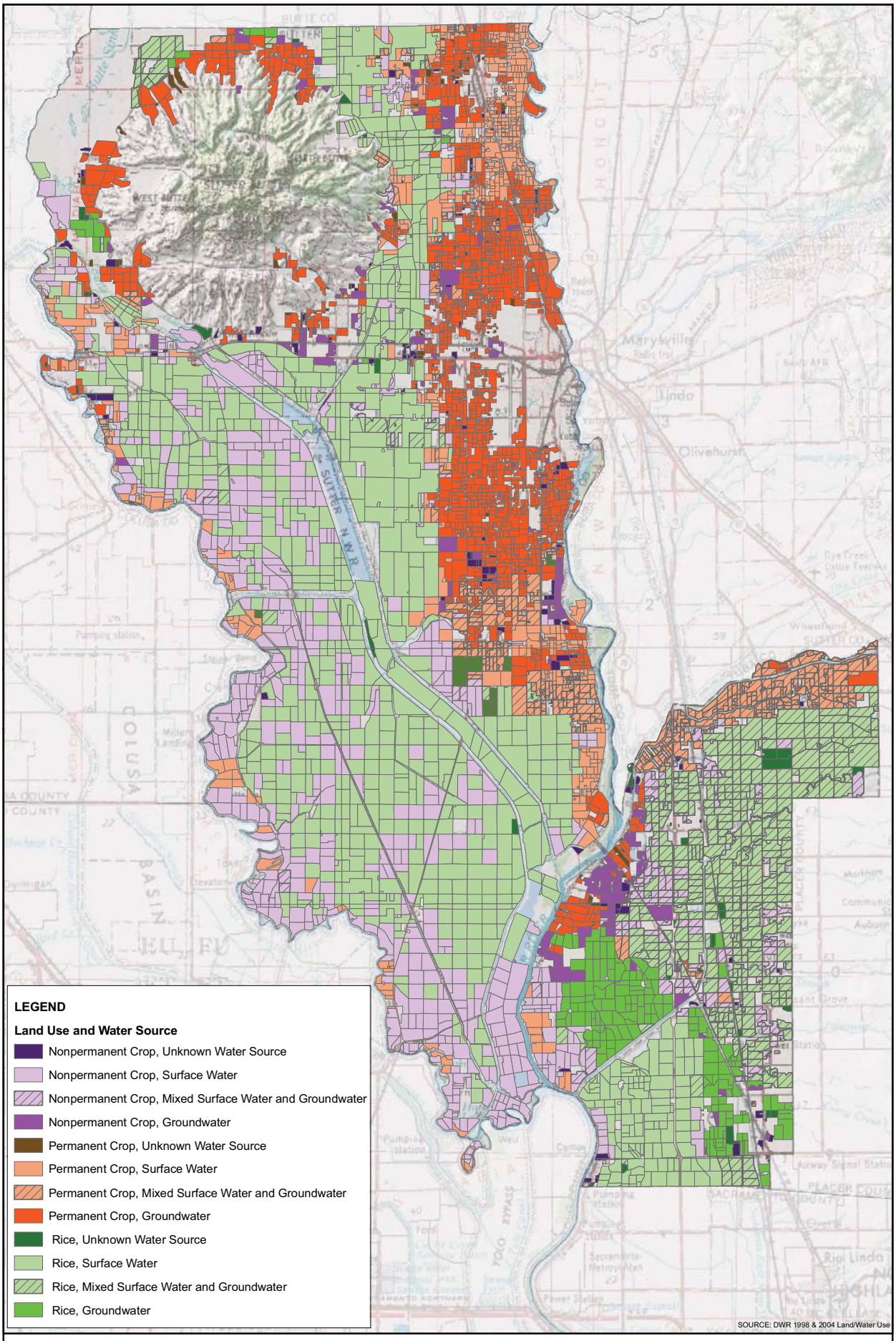

FIGURE 6
WATER SOURCES FOR IRRIGATED CROPS
SUTTER COUNTY GROUNDWATER MANAGEMENT PLAN
FEBRUARY 2012

NORTH
0 1.5 3
MILES

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J:\Jobs\8337_SutterCounty\GIS\Tasks\20120116 Final Draft\Figure 6 Water_Source_IRR_Crops_.mxd 2/7/2012 12:52:19 PM bdemucha

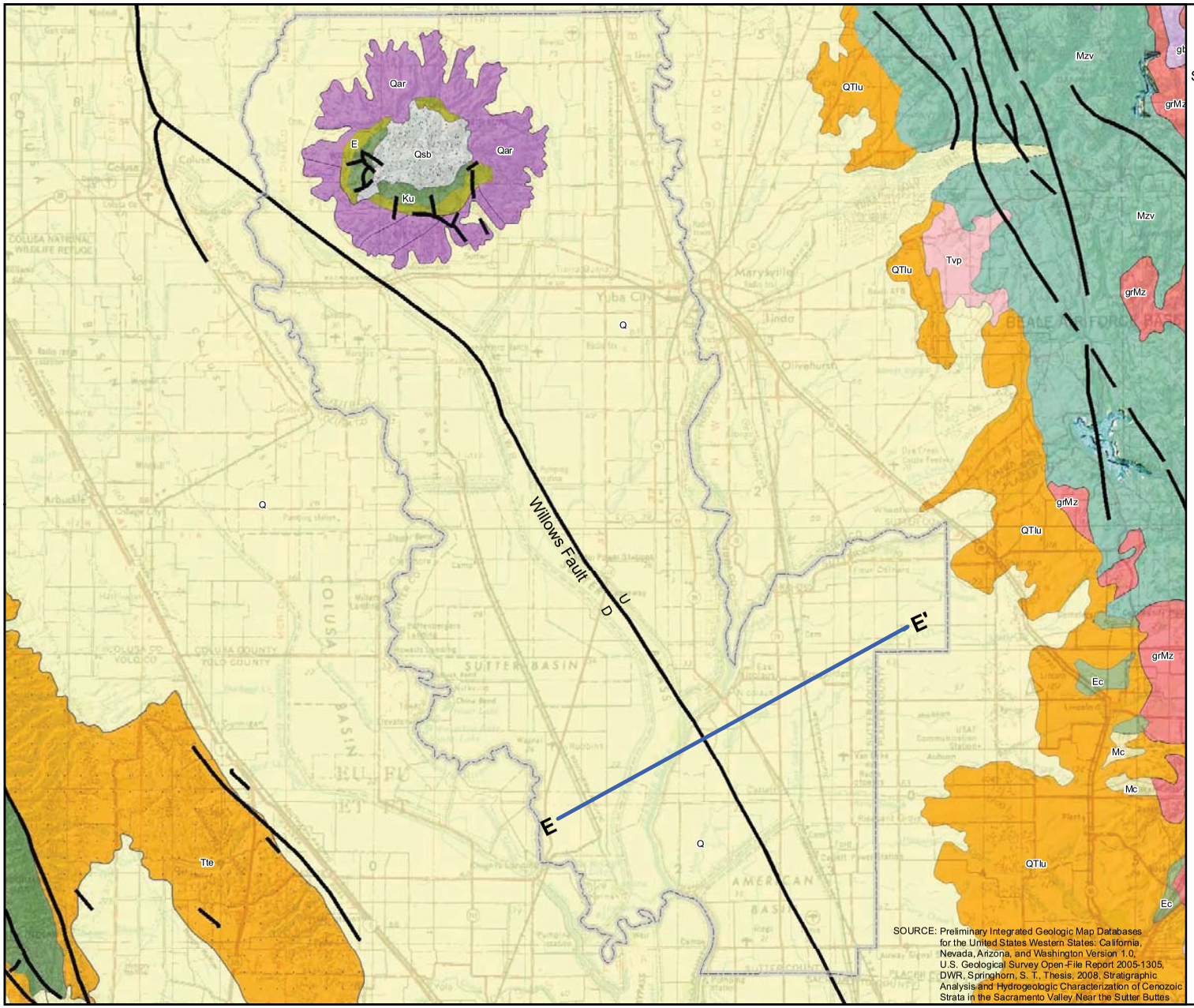

FIGURE 7
SIMPLIFIED SURFACE GEOLOGY AND FAULTS
SUTTER COUNTY GROUNDWATER MANAGEMENT PLAN
FEBRUARY 2012

NORTH

0 2 4
MILES

LEGEND

- Q - Recent Deposits
  - Qb - Basin Deposits
  - Qm - Modesto Formation
  - Qr - Riverbank Formation
- Qsb - Sutter Buttes Igneous Rocks
- Qar - Sutter Buttes Andesitic Rampart
- QTlu - Laguna Formation
- Tte - Tehama Formation
- Tvp - Andesite, Rhyolite
- Mc - Sandstone, Conglomerate
- Ec - Conglomerate, Sandstone
- E - Mudstone, Sandstone
- Ku - Sandstone, Mudstone
- J - Mudstone, Sandstone, & Slate
- um - Serpentinite
- Mzv - Volcanic, Metavolcanic
- gb - Gabbro, Diorite
- grMz - Granodiorite
- Fault
- Fault Displacement - U, upthrown side; D, downthrown side
- Counties
- Simplified Conceptual Geologic Cross Section Line (See Figure 8)

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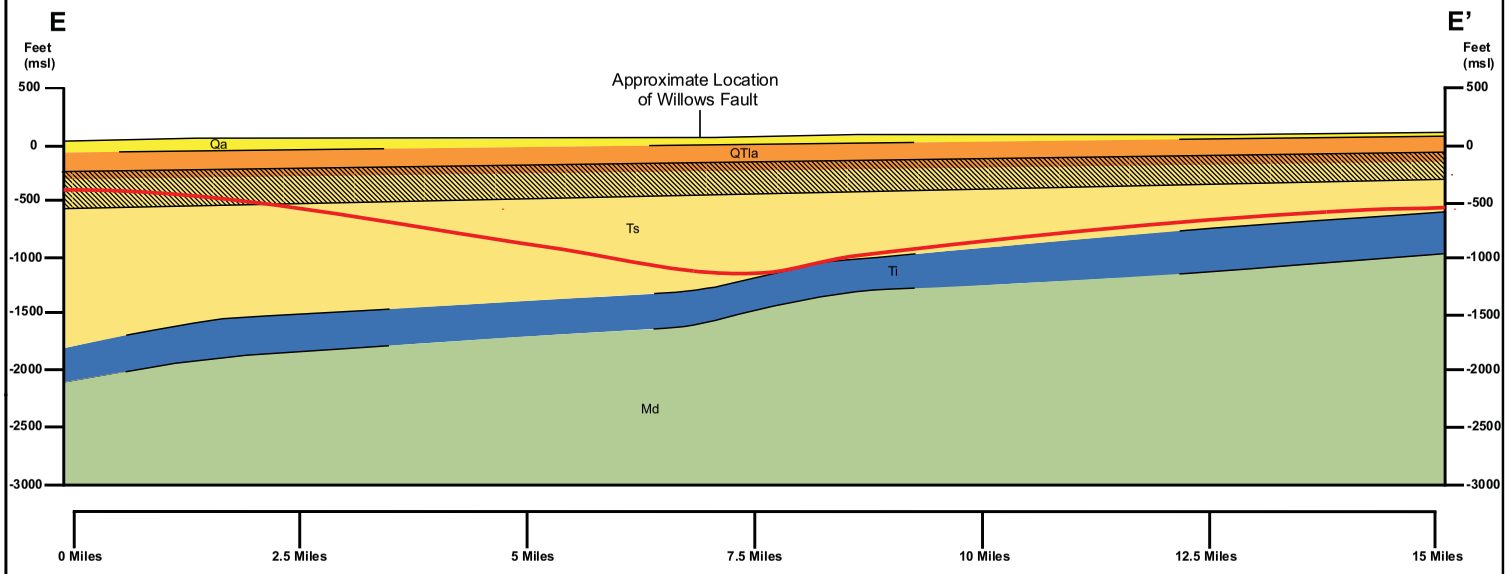
J:\Jobs\8337_SutterCounty\GIS\Tasks\20120116 Final Draft\Figure 7 Simplified Surface Geology and Faults.mxd 2/7/2012 12:54:14 PM bdemucha



Cross Section Scale

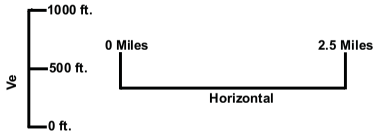


FIGURE 8
SIMPLIFIED CONCEPTUAL GEOLOGIC CROSS SECTION
SUTTER COUNTY GROUNDWATER MANAGEMENT PLAN
FEBRUARY 2012

Explanation

- Qa — Alluvial Deposits
- QTla — Laguna Formation
- Laguna and Sutter Formation Transition (approximate depth)
- Ts — Sutter Formation (map unit, Williams and Curtis, 1977; Helley and Harwood, 1985)
  - Tt — Tuscan Formation (map unit, Helley and Harwood, 1985)
  - Tm — Mehrten Formation (map unit, Helley and Harwood, 1985)
- Ti — Ione Formation (map unit, Helley and Harwood, 1985)
- Md — Marine Deposits
- Inferred Geologic Contact
- Approximate Base of Fresh Water. Line represent depths at which Specific Conductance levels exceed approximately 3,000 umhos/cm

SOURCES: DOGGR; DWR; Springhom, S. T., Thesis, 2008, Stratigraphic Analysis and Hydrogeologic Characterization of Cenozoic Strata in the Sacramento Valley Near the Sutter Buttes; Berkstresser, C.F. Jr. 1973. Base of Fresh Ground-Water -- Approximately 3,000 micromhos in the Sacramento Valley and Sacramento-San Joaquin Delta, California. U.S. Geological Survey Water-Resource Inv. 40-73; Helley, E. J. and Harwood, D. S., 1985, Geologic Map of Late Cenozoic Deposits of the Sacramento Valley and Northern Sierran Foothills, California.

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J:\Jobs\8337_SutterCounty\GIS\Tasks\20120116 Final Draft\Figure 8 Geologic Cross Section E-E'.mxd 2/7/2012 12:57:54 PM bdemucha

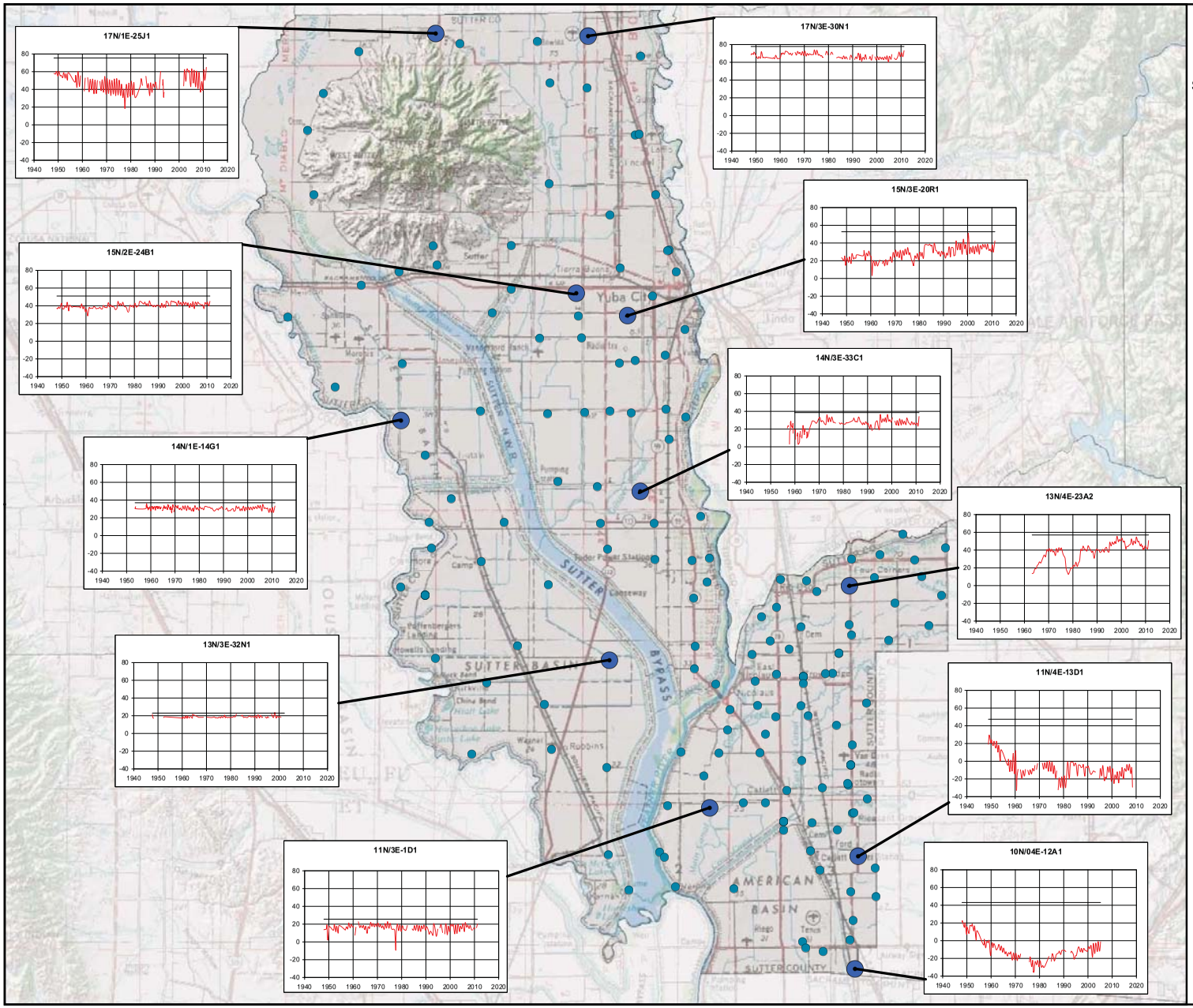


FIGURE 9
HISTORIC GROUNDWATER ELEVATIONS IN SUTTER COUNTY
SUTTER COUNTY GROUNDWATER MANAGEMENT PLAN
FEBRUARY 2012

NORTH

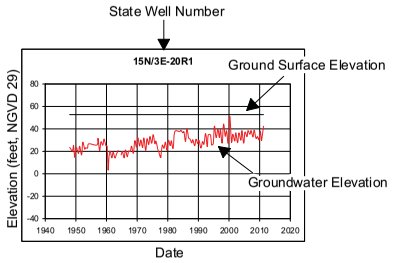
0 2 4
MILES

Legend

- Well with Hydrograph Shown
- Well with Water Level Measurement since 2004

Note: This figure represents wells with historic water level and current measurements either submitted to or obtained by the California Department of Water Resources and may not represent current monitoring activities. Groundwater elevations are in feet above mean sea level.

SOURCE: DWR



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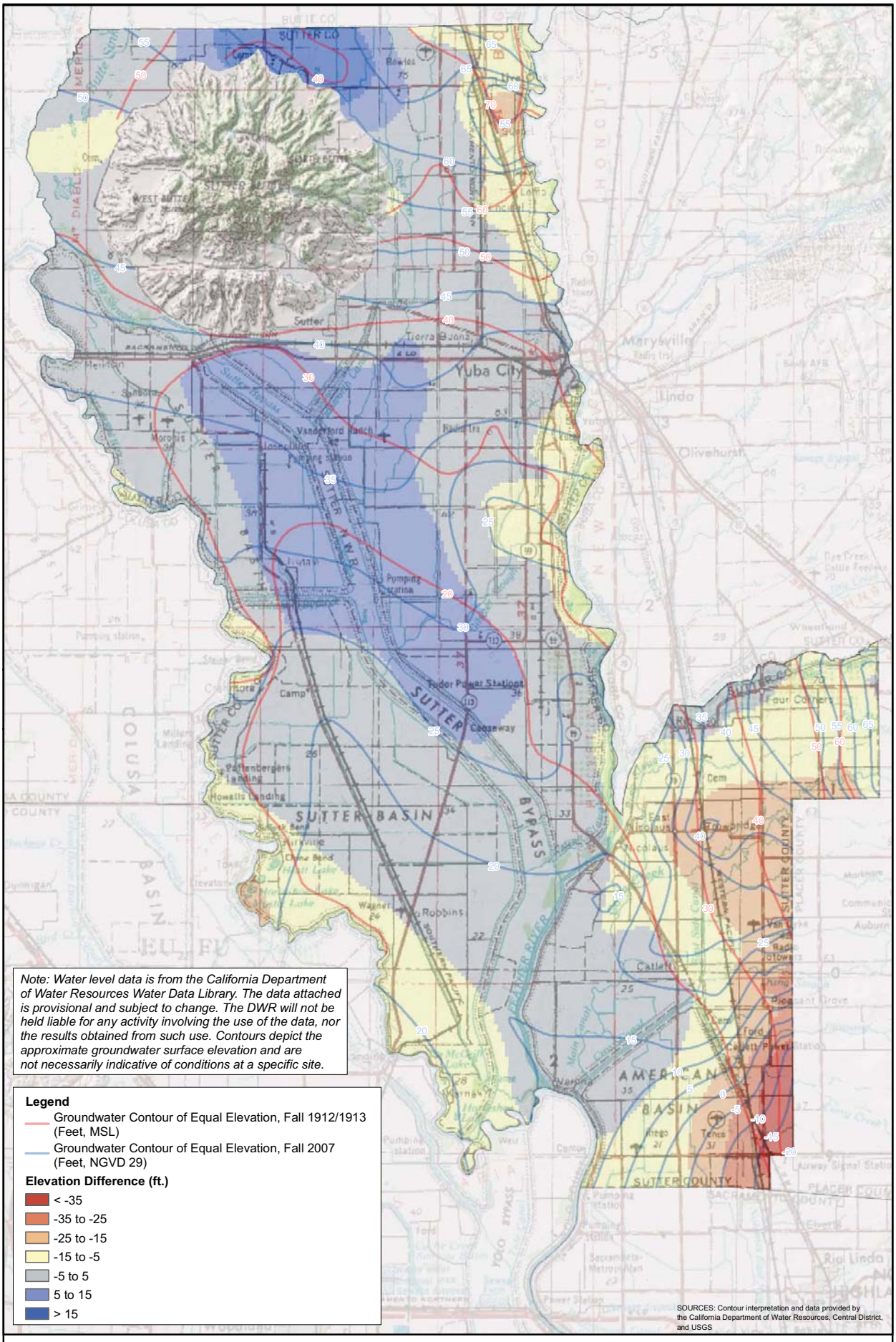

FIGURE 10
GROUNDWATER LEVEL CHANGE MAP
FALL 2007 AND FALL 1912/1913
SUTTER COUNTY GROUNDWATER MANAGEMENT PLAN
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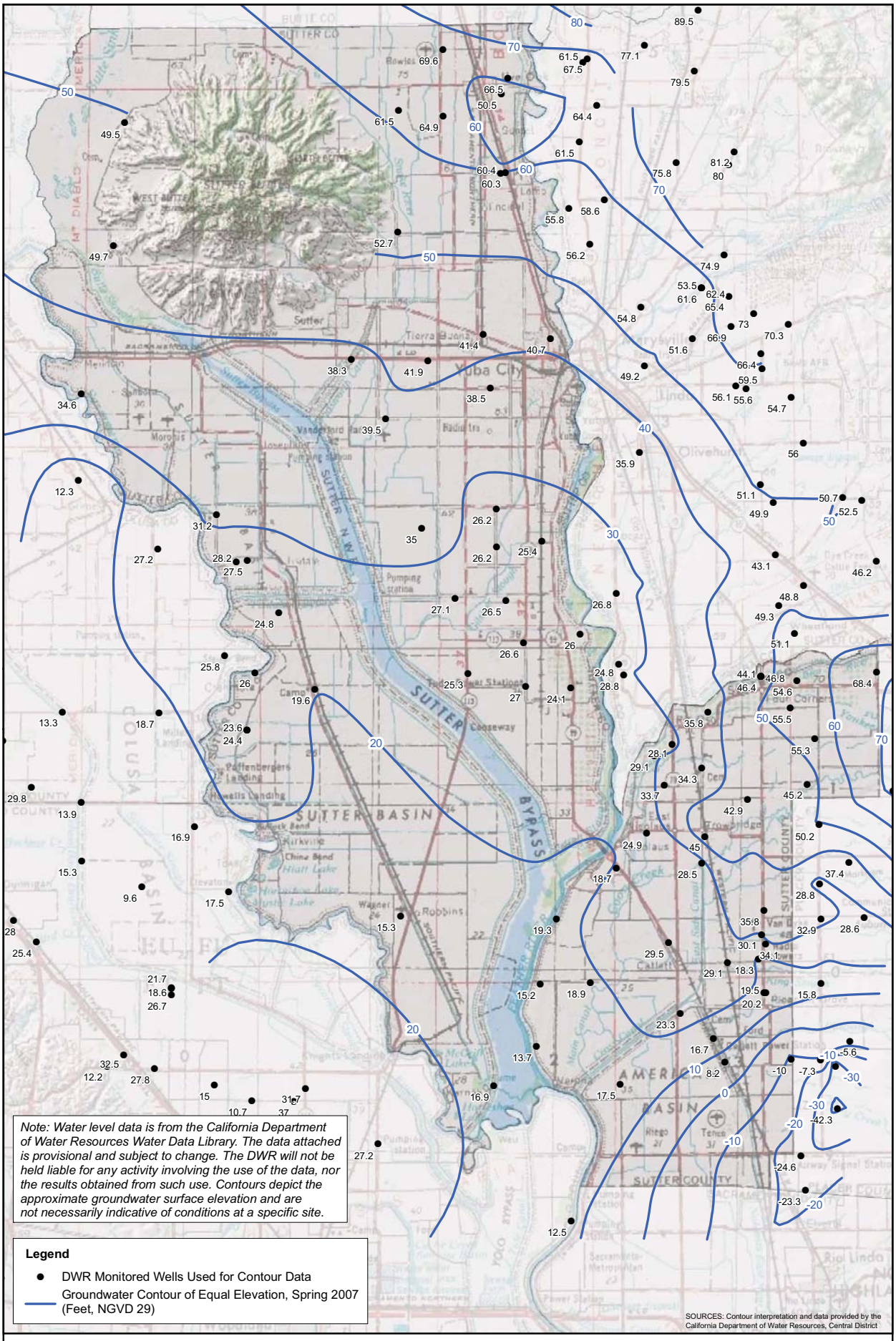

FIGURE 11
GROUNDWATER ELEVATION CONTOUR MAP
SPRING, 2007
SUTTER COUNTY GROUNDWATER MANAGEMENT PLAN
FEBRUARY 2012

NORTH
0 1.5 3
MILES

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J:\Jobs\8337_SutterCounty\GIS\Tasks\20120201 Final Draft Figure Comments\Figure 11 Groundwater Elevation Contour Map Spring 2007.mxd 2/7/2012 5:55:07 PM bdemucha

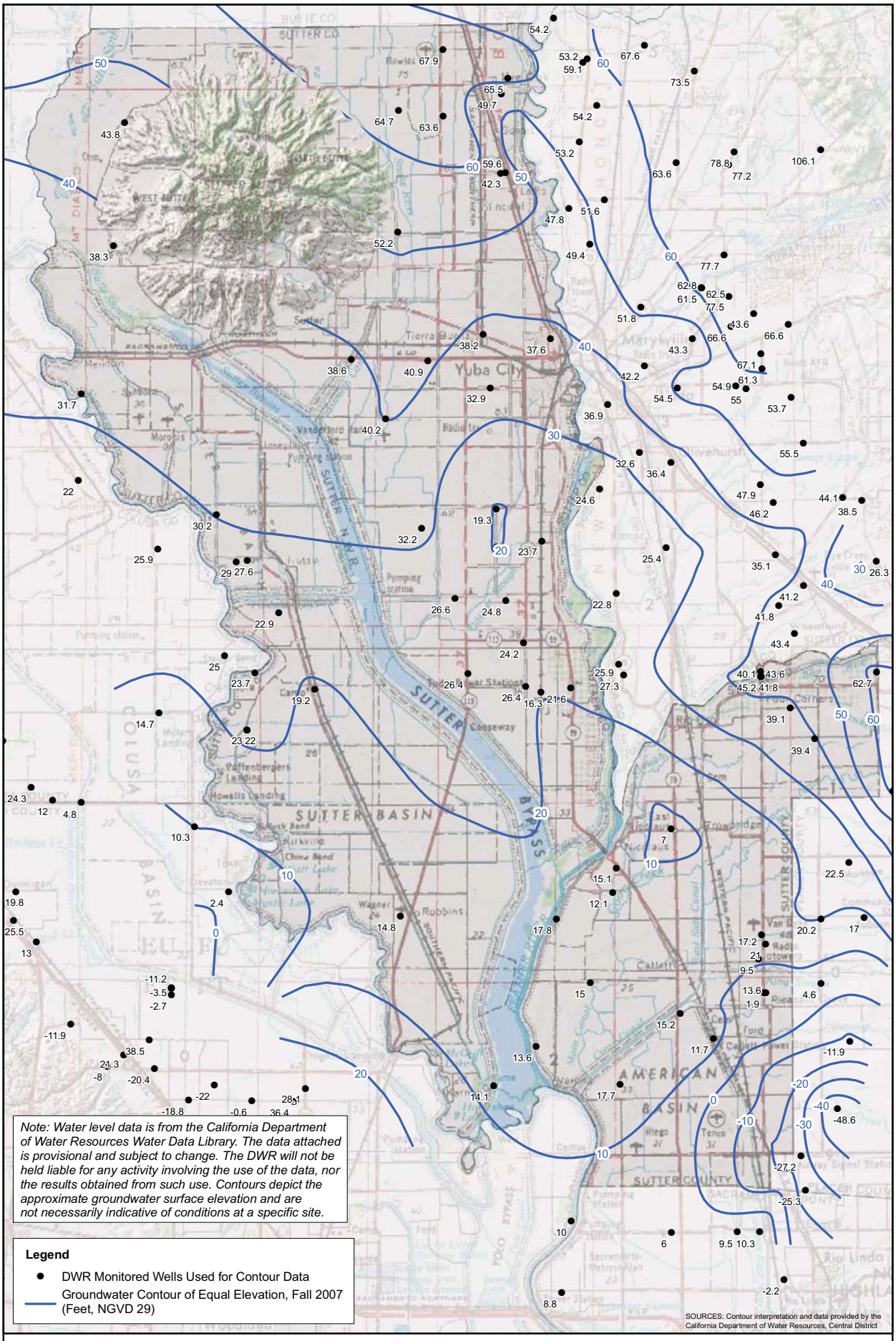

FIGURE 12
GROUNDWATER ELEVATION CONTOUR MAP
FALL, 2007
SUTTER COUNTY GROUNDWATER MANAGEMENT PLAN
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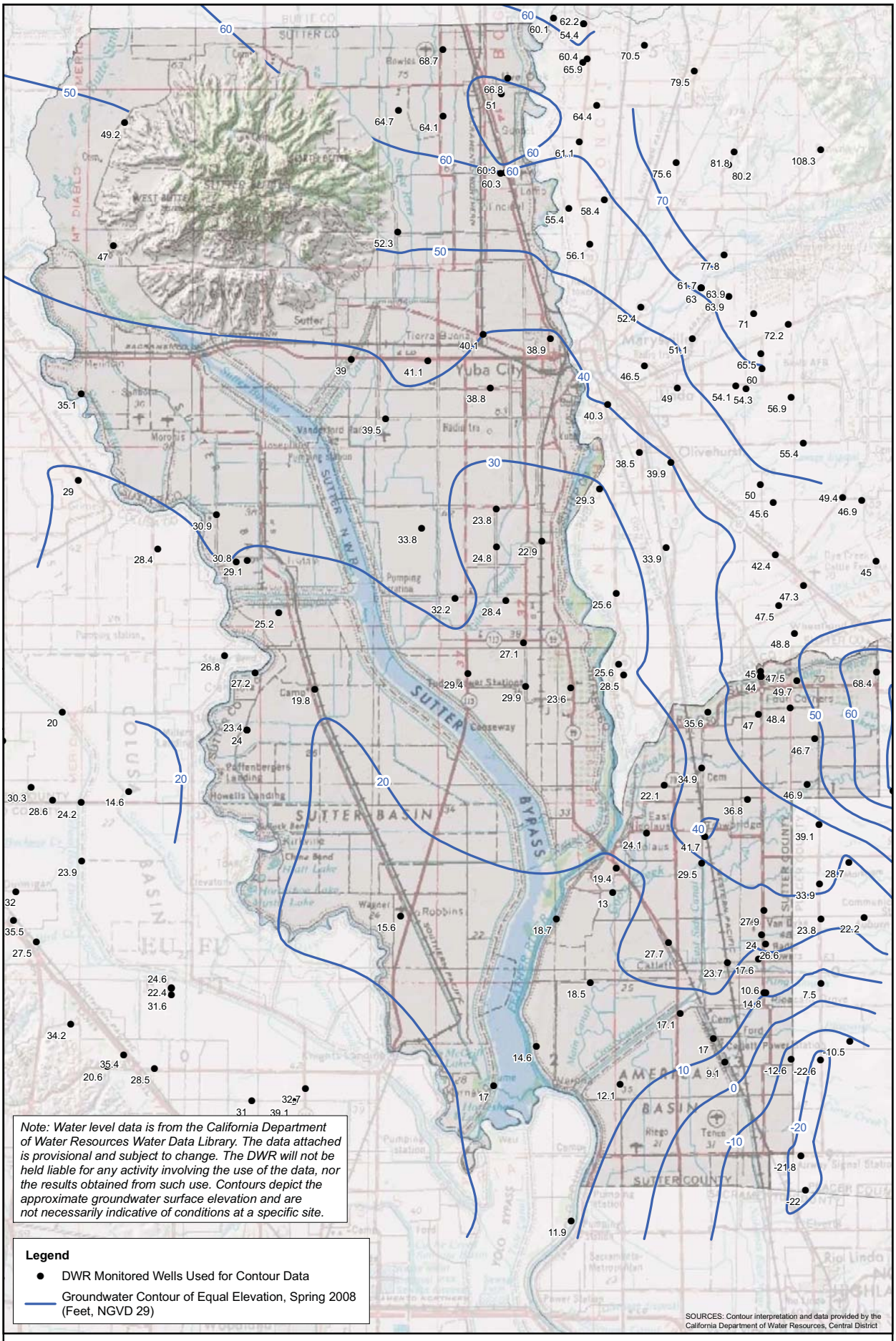

FIGURE 13
GROUNDWATER ELEVATION CONTOUR MAP
SPRING, 2008
SUTTER COUNTY GROUNDWATER MANAGEMENT PLAN
FEBRUARY 2012

NORTH
0 1.5 3
MILES

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J:\Jobs\8337_SutterCounty\GIS\Tasks\20120116 Final Draft\Figure 13 Groundwater Elevation Contour Map Spring 2008.mxd 2/7/2012 6:20:59 PM bdemucha

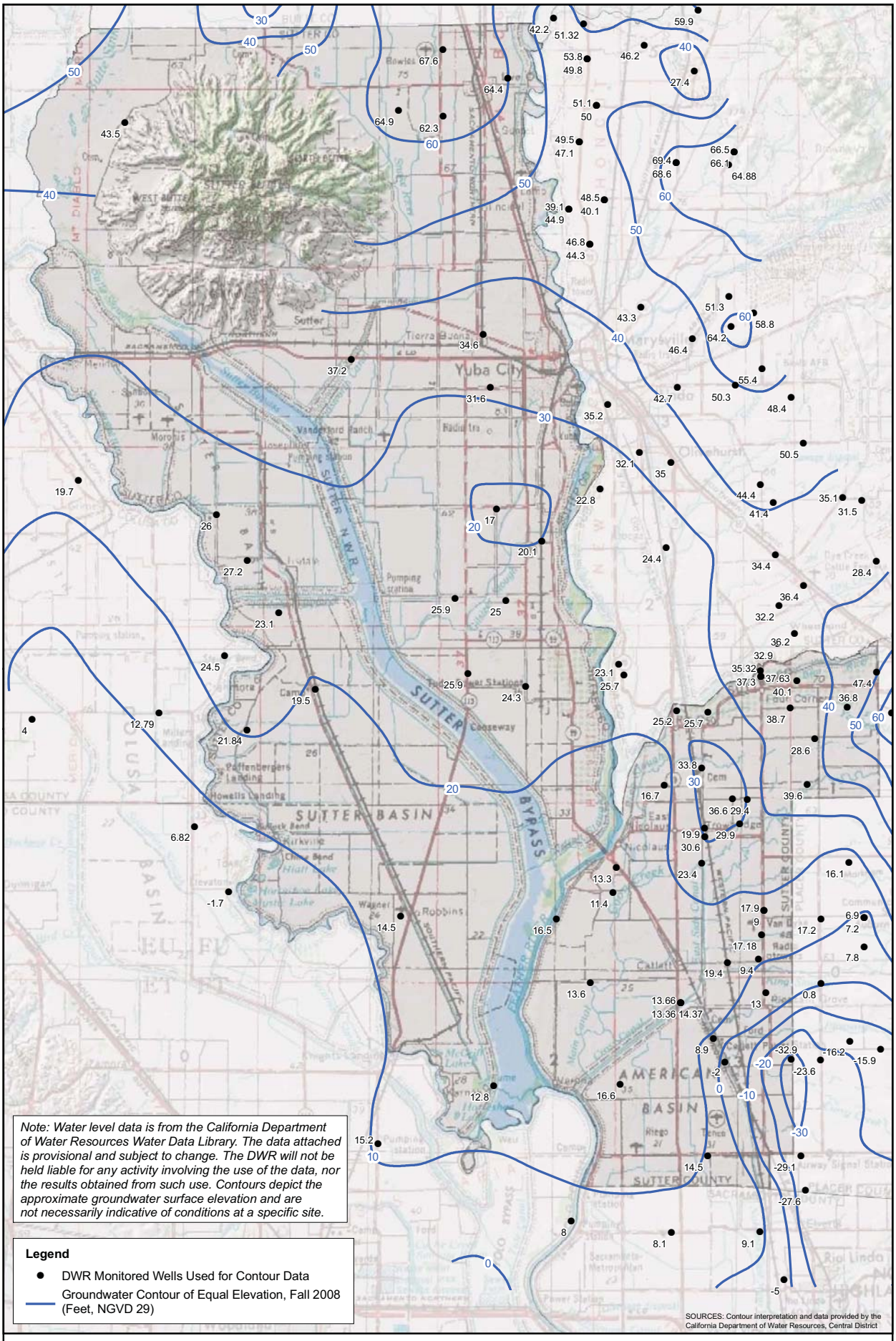

FIGURE 14
GROUNDWATER ELEVATION CONTOUR MAP
FALL, 2008
SUTTER COUNTY GROUNDWATER MANAGEMENT PLAN
FEBRUARY 2012

NORTH
0 1.5 3
MILES

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J:\Jobs\8337_SutterCounty\GIS\Tasks\20120116 Final Draft\Figure 14 Groundwater Elevation Contour Map Fall 2008.mxd 2/8/2012 9:20:28 AM bdemucha

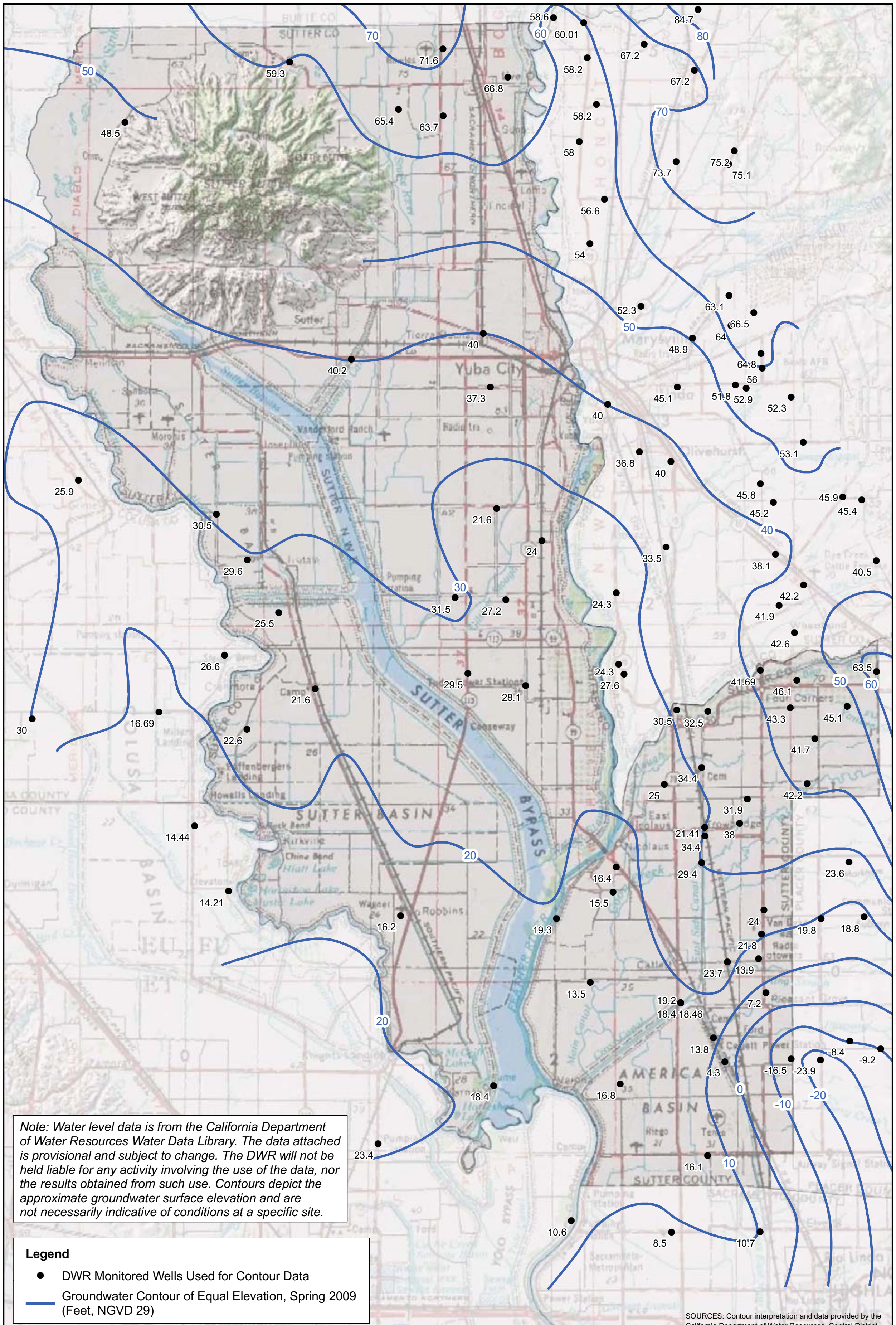

FIGURE 15
GROUNDWATER ELEVATION CONTOUR MAP
SPRING, 2009

SUTTER COUNTY GROUNDWATER MANAGEMENT PLAN
FEBRUARY 2012

NORTH
0 1.5 3
MILES

SUTTER COUNTY CALIFORNIA

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J:\Jobs\8337_SutterCounty\GIS\Tasks\20120116 Final Draft\Figure 15 Groundwater Elevation Contour Map Spring 2009.mxd 2/8/2012 9:33:20 AM bdemucha

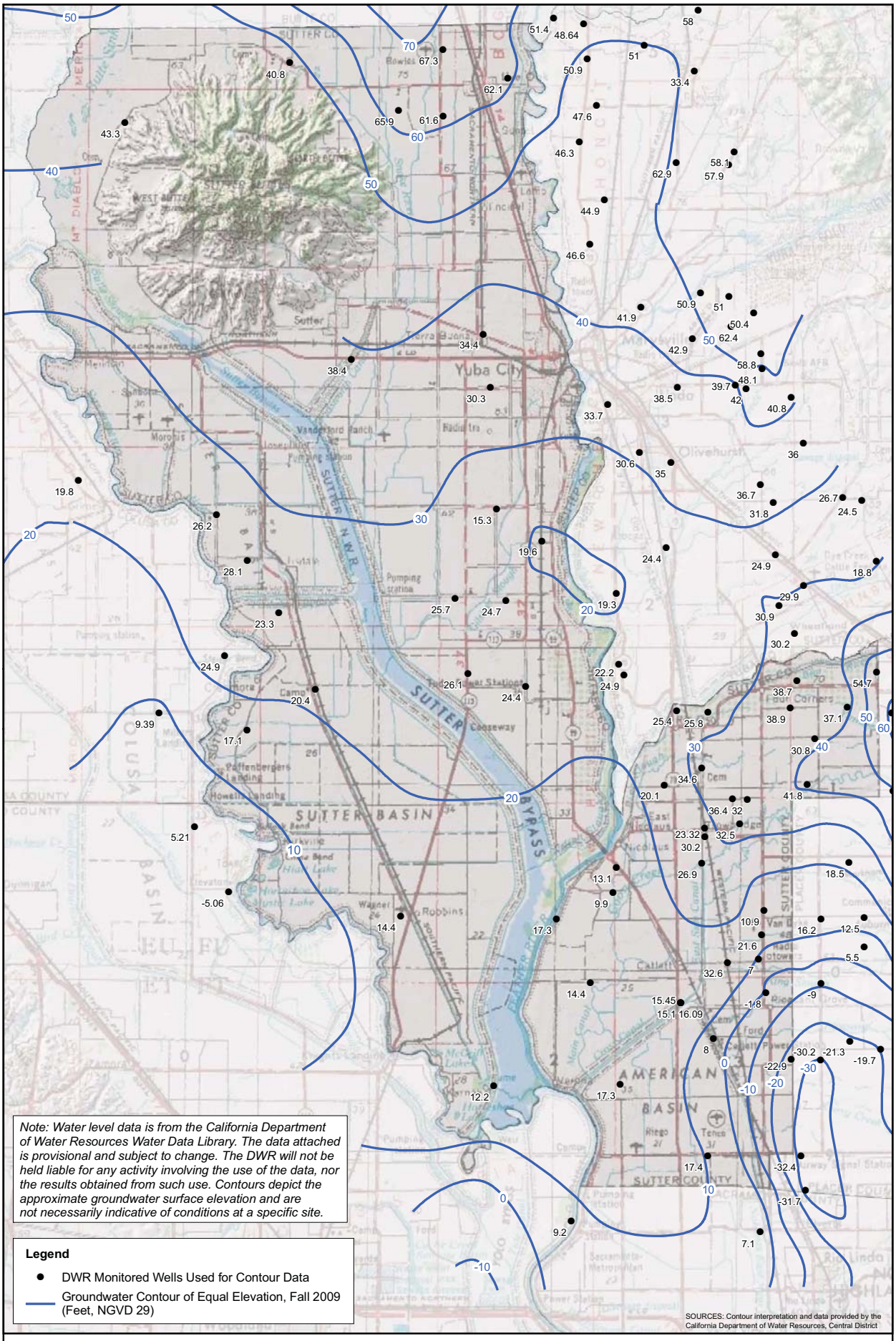

FIGURE 16
GROUNDWATER ELEVATION CONTOUR MAP
FALL, 2009
SUTTER COUNTY GROUNDWATER MANAGEMENT PLAN
FEBRUARY 2012

NORTH
0 1.5 3
MILES

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J:\Jobs\8337_SutterCounty\GIS\Tasks\20120116 Final Draft\Figure 16 Groundwater Elevation Contour Map Fall 2009.mxd 2/8/2012 9:44:53 AM bdemucha

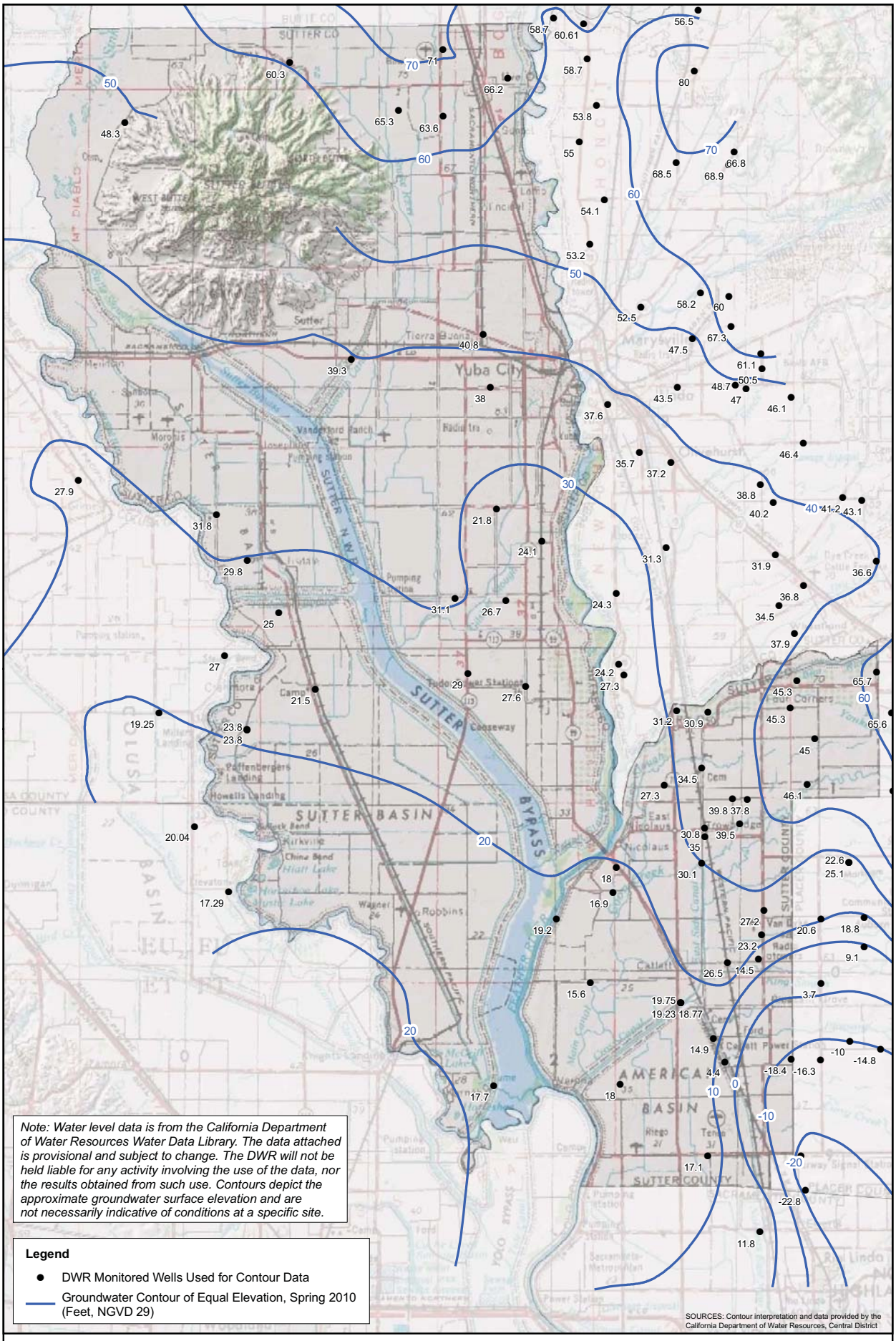

FIGURE 17
GROUNDWATER ELEVATION CONTOUR MAP
SPRING, 2010
SUTTER COUNTY GROUNDWATER MANAGEMENT PLAN
FEBRUARY 2012

NORTH
0 1.5 3
MILES

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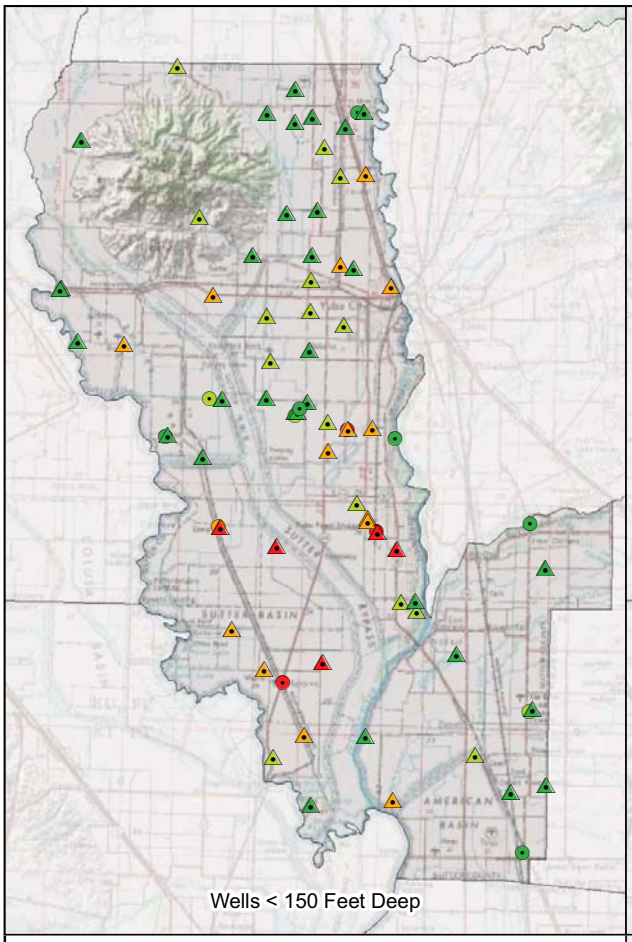
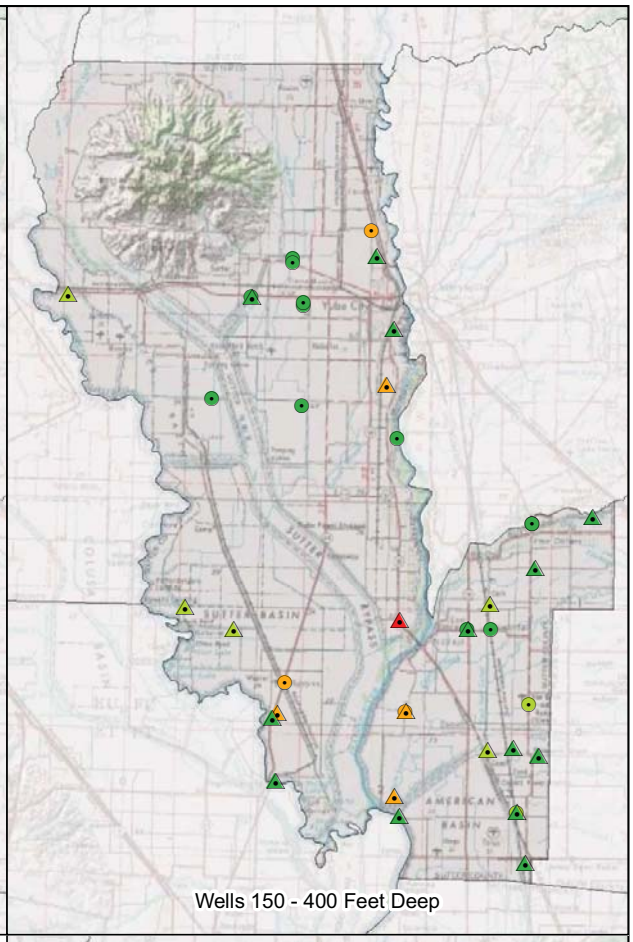
J:\Jobs\8337_SutterCounty\GIS\Tasks\20120116 Final Draft\Figure 17 Groundwater Elevation Contour Map Spring 2010.mxd 2/8/2012 9:53:27 AM bdemucha





EC in DWR Wells (µmhos/cm)

- < 600
- 600 - 900
- 900 - 1600
- > 1600

EC in USGS Wells (µmhos/cm)

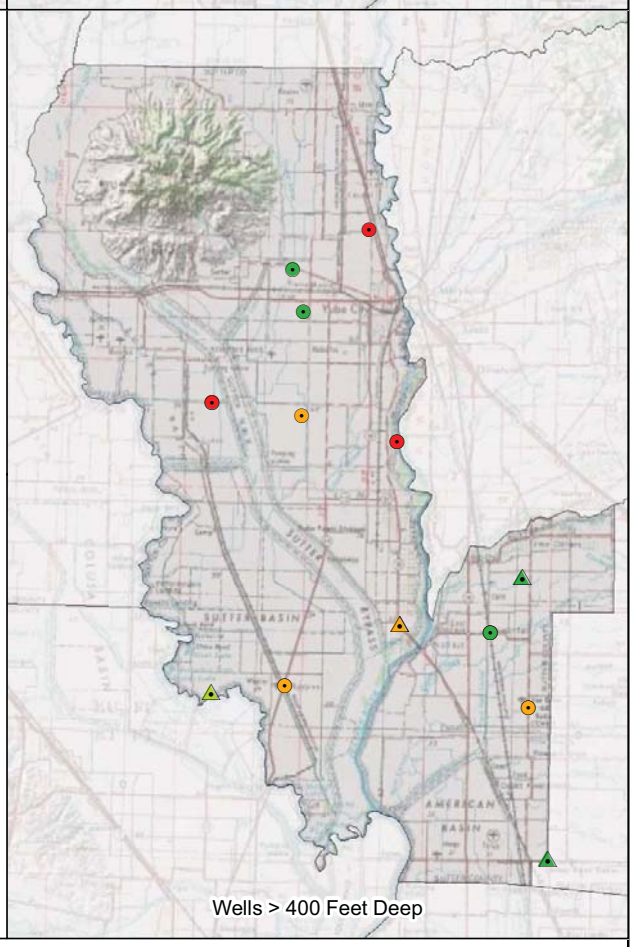
- < 600
- 600 - 900
- 900 - 1600
- > 1600

Note:
"EC" is an abbreviation for specific conductance, which is related to the salt content of a water sample.

For public drinking water systems, the secondary (aesthetic) maximum contaminant levels for EC are 900 micromhos/centimeter (µmhos/cm) (recommended), 1600 µmhos/cm (upper), and 2200 µmhos/cm (short-term).

For irrigation, crop yields decrease above a threshold EC value, which is crop-dependent. Crop yield potential decreases above these threshold levels:

Almonds - 1000 µmhos/cm
Beans - 700 µmhos/cm
Rice - 2000 µmhos/cm
Squash - 2100-3100 µmhos/cm
Tomatoes - 1700 µmhos/cm
Wheat - 4000 µmhos/cm



SOURCES: USGS, DWR, SEWD, DHS, FAO, EPA

FIGURE 18
SPECIFIC CONDUCTANCE BY WELL DEPTH
SUTTER COUNTY GROUNDWATER MANAGEMENT PLAN
FEBRUARY 2012

NORTH
0 3 6
MILES

SUTTER COUNTY CALIFORNIA

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J:\Jobs\8337_SutterCounty\GIS\Tasks\20120116 Final Draft\Figure 18 EC_Well Depth.mxd 2/8/2012 10:00:29 AM bdemucha

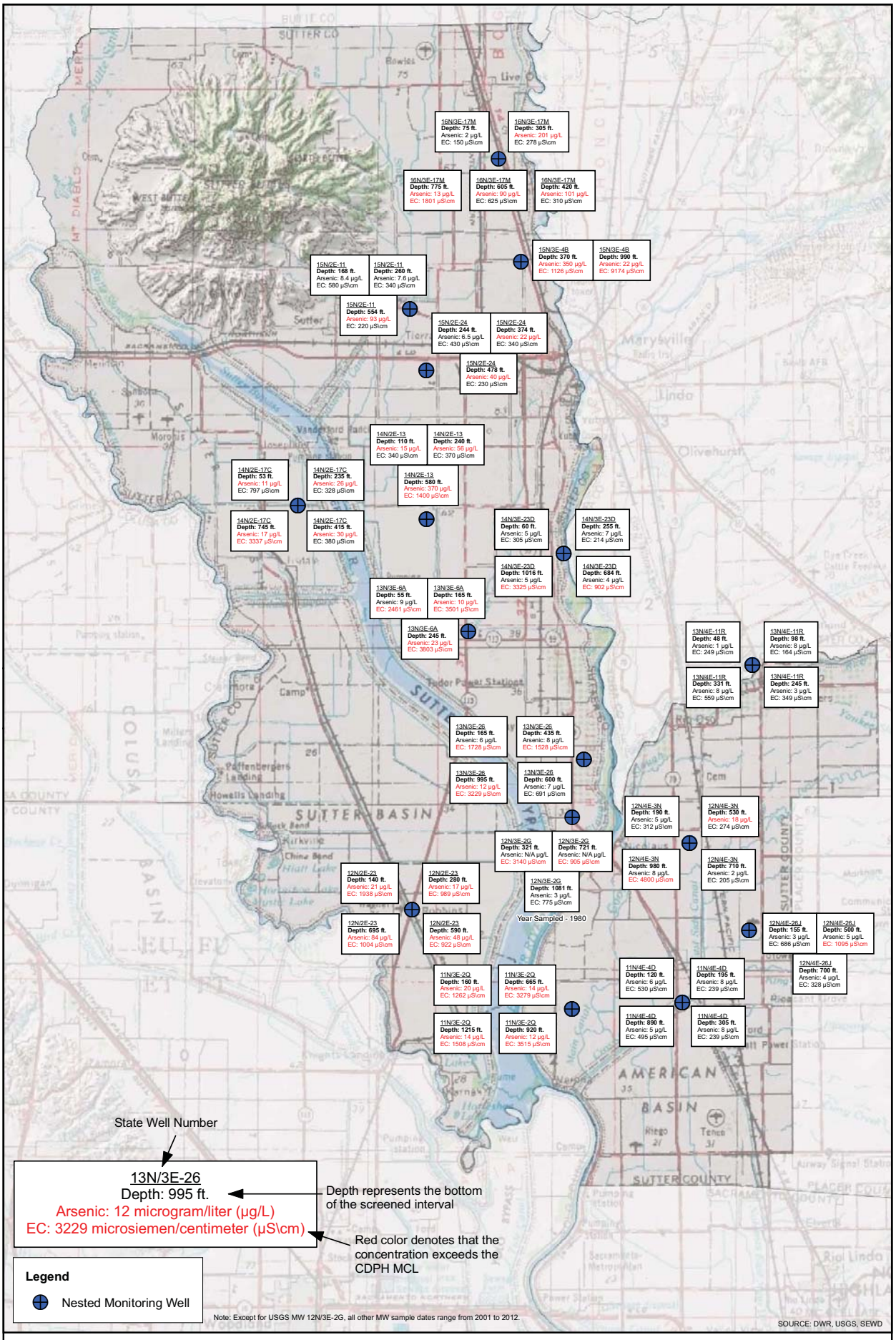

FIGURE 19
DEPTH SPECIFIC ARSENIC AND SPECIFIC CONDUCTANCE CONCENTRATIONS
SUTTER COUNTY GROUNDWATER MANAGEMENT PLAN
FEBRUARY 2012

NORTH
0 1.5 3
MILES

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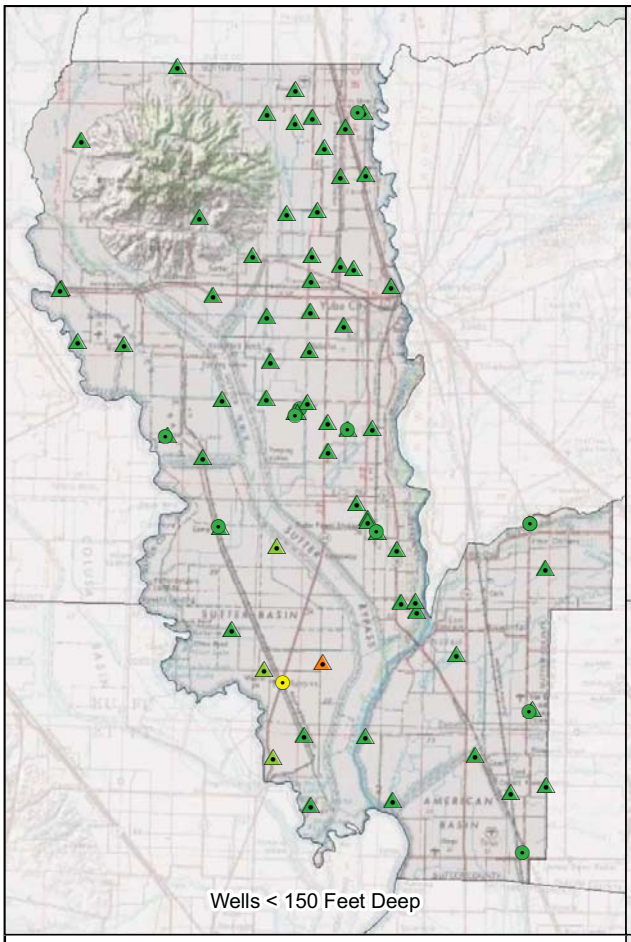
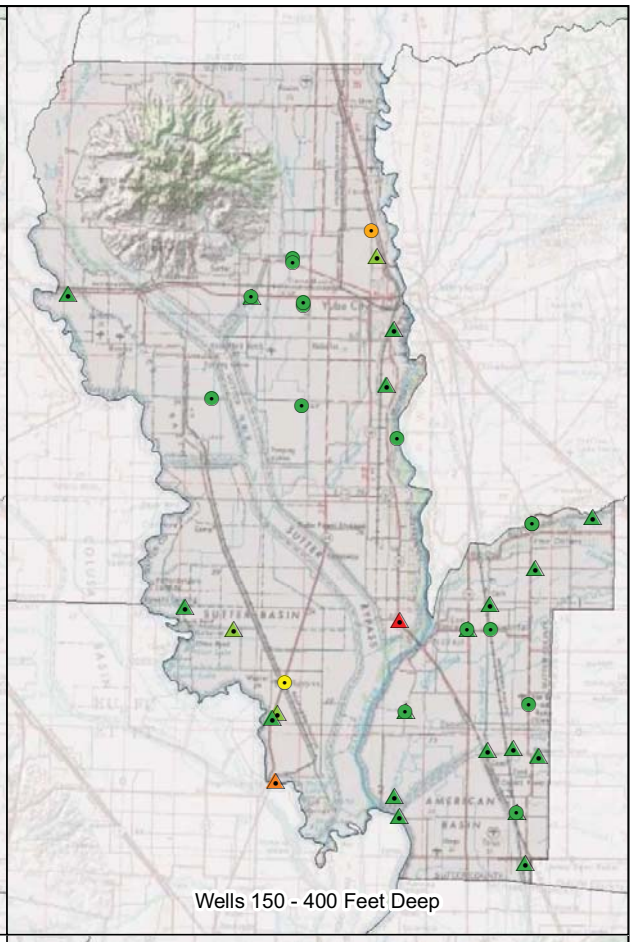
J:\Jobs\8337_SutterCounty\GIS\Tasks\20120201 Final Draft Figure Comments\Figure 19 Depth Specific Arsenic and Specific Conductance.mxd 2/8/2012 11:34:41 AM bdemucha





Boron in DWR Wells (µg/L)

- < 500
- 500 - 750
- 750 - 1000
- 1000 - 2000
- > 2000

Boron in USGS Wells (µg/L)

- < 500
- 500 - 750
- 750 - 1000
- 1000 - 2000
- > 2000

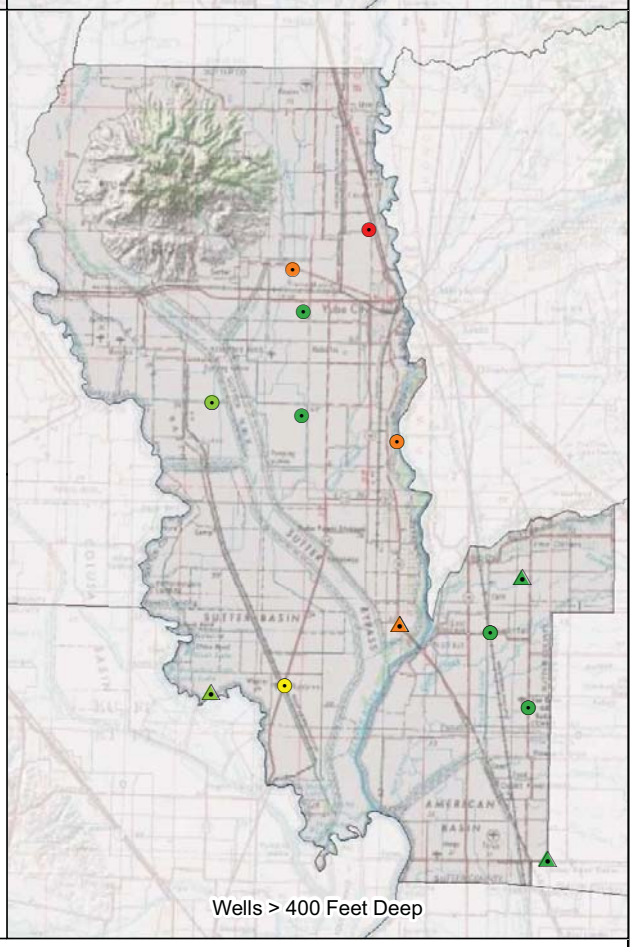
Note:
Boron is naturally occurring and leaches from aquifer materials into groundwater.

For public drinking water systems, there is a notification level for boron of 1000 micrograms/liter (µg/L).

For irrigation, boron is necessary for crop growth but becomes toxic to the point that yields may decrease above these threshold levels:

Beans - 750 - 1000 µg/L
Grapes - 500 - 750 µg/L
Squash - 2000 - 4000 µg/L
Tomatoes - 4000 - 6000 µg/L
Walnuts - 500 - 750 µg/L
Wheat - 750 - 1000 µg/L

Many other trees are vulnerable to boron toxicity above 500 - 750 µg/L.



SOURCES: USGS, DWR, SEWD, DHS, FAO, EPA

FIGURE 20
BORON BY WELL DEPTHS
SUTTER COUNTY GROUNDWATER MANAGEMENT PLAN
FEBRUARY 2012

NORTH
0 3 6
MILES

SUTTER COUNTY CALIFORNIA

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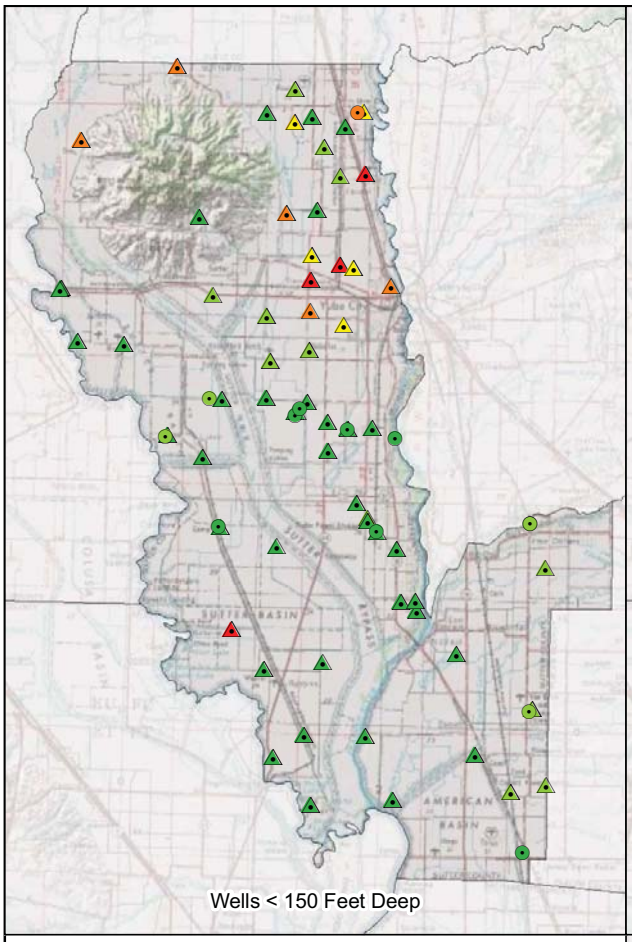
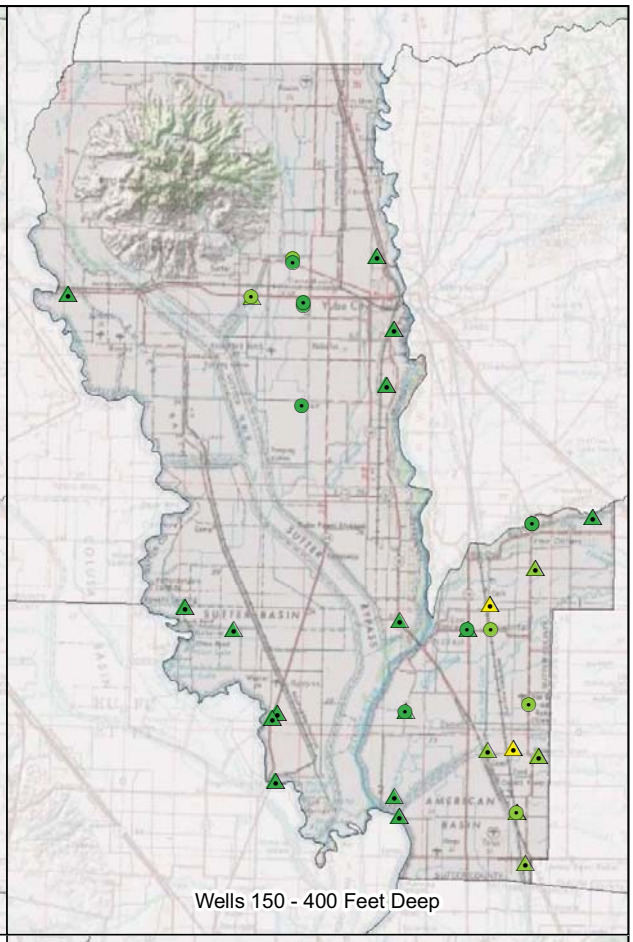




Nitrate in DWR Wells (mg/L)

- < 5
- 5 - 15
- 15 - 30
- 30 - 45
- > 45

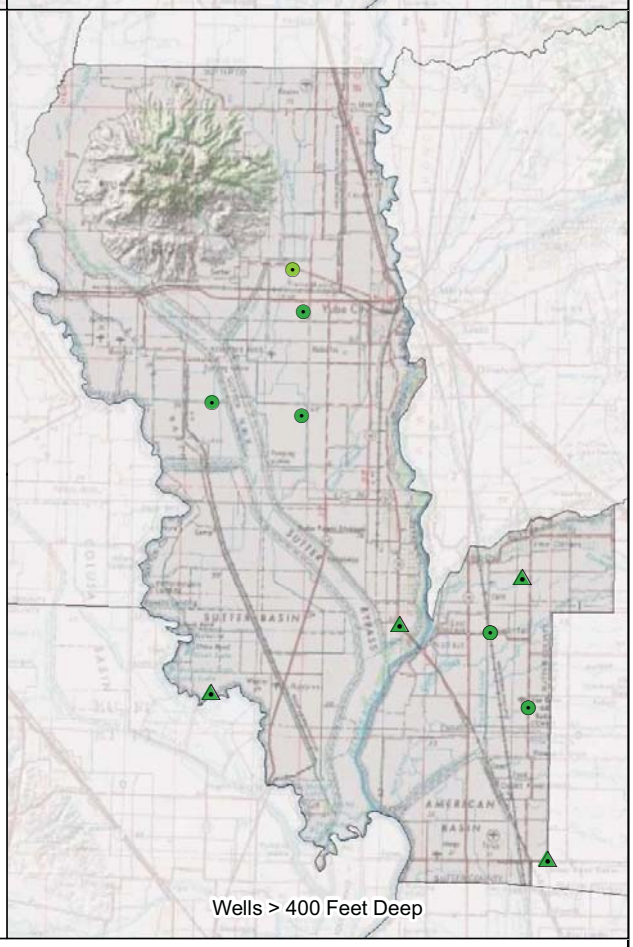
Nitrate in USGS Wells (mg/L)

- < 15
- 5 - 15
- 15 - 30
- 30 - 45
- > 45

Note:
Nitrate is generally introduced into groundwater by septic systems, fertilizers, or confined animal operations.

For public drinking water systems, the primary (health-based) maximum contaminant level for nitrate as NO3 is 45 milligrams/liter (mg/L).

At concentrations exceeding the maximum contaminant level, nitrate can interfere with the blood's ability to carry oxygen. This effect can be especially pronounced in infants, where it is known as "blue baby syndrome".



SOURCES: USGS, DWR, SEWD, DHS, FAO, EPA

FIGURE 21
NITRATE BY WELL DEPTH
SUTTER COUNTY GROUNDWATER MANAGEMENT PLAN
FEBRUARY 2012

NORTH
0 3 6
MILES

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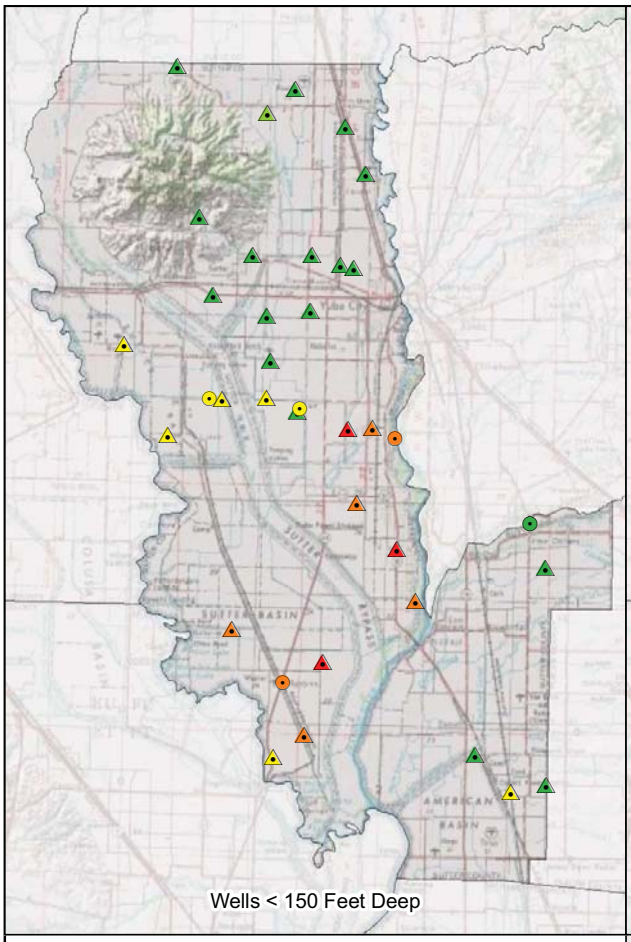
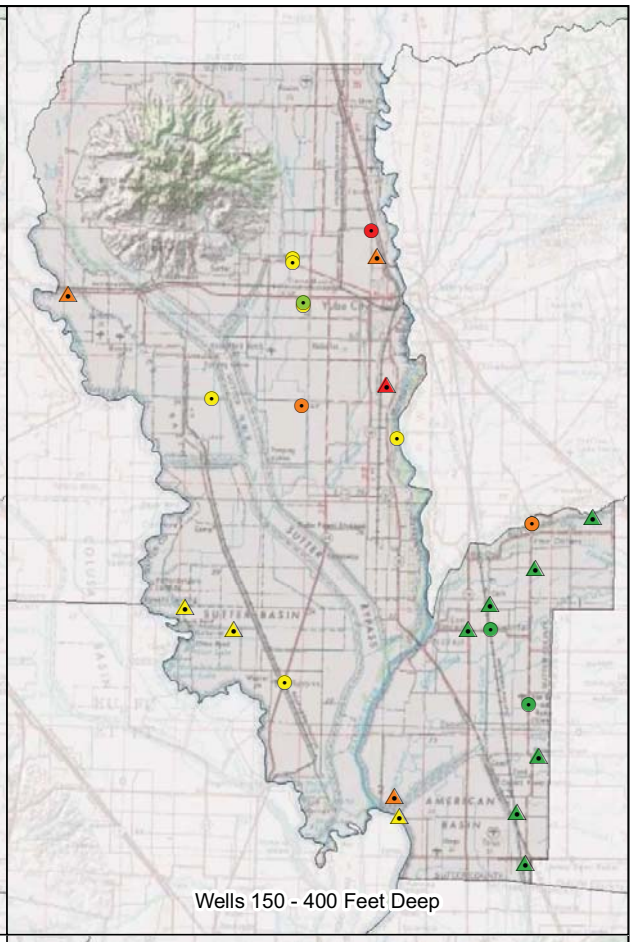
J:\Jobs\8337_SutterCounty\GIS\Tasks\20120116 Final Draft\Figure 21 Nitrates_Well Depth.mxd 2/8/2012 2:10:46 PM bdemucha



Wells < 150 Feet Deep



Wells 150 - 400 Feet Deep

Manganese in DWR Wells (µg/L)

- < 25
- 25 - 50
- 50 - 150
- 150 - 500
- > 500

Manganese in USGS Wells (µg/L)

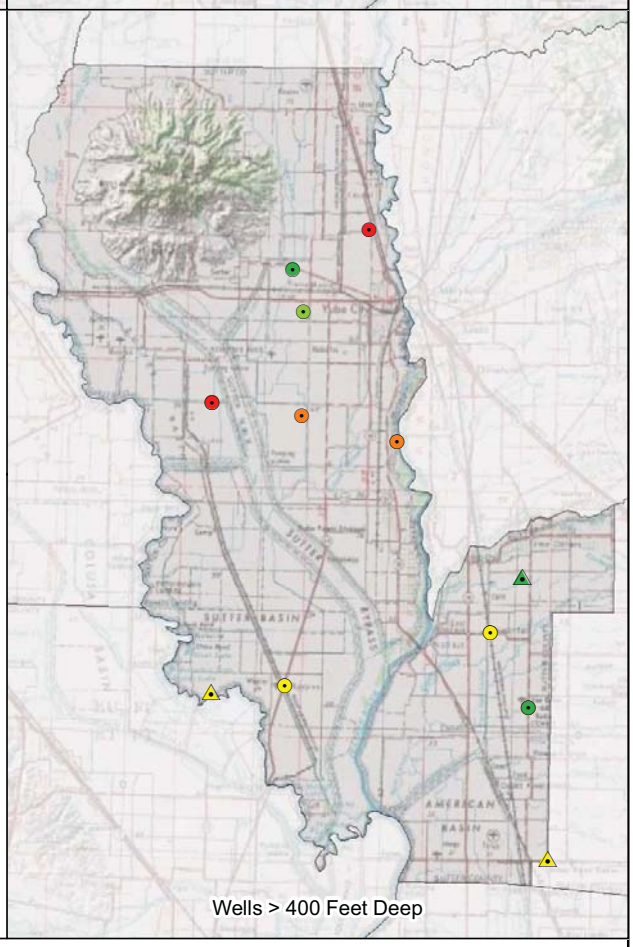
- < 25
- 25 - 50
- 50 - 150
- 150 - 500
- > 500

Note:
Manganese is naturally occurring and leaches from aquifer materials into groundwater.

For public drinking water systems, the secondary (aesthetic) maximum contaminant level for manganese is 50 micrograms/liter (µg/L). There is also a notification level for manganese of 500 µg/L. Notification levels are health-based advisory levels for chemicals that do not have primary maximum contaminant levels.

Manganese can cause staining of plumbing and fixtures, and can contribute a metallic odor to water. At very high concentrations (above the notification level) manganese may cause neurologic problems.

Analysis for manganese is very sensitive to turbidity of samples - turbid samples will often have artificially high results for manganese.



Wells > 400 Feet Deep

SOURCES: USGS, DWR, SEWD, DHS, FAO, EPA

FIGURE 22
MANGANESE BY WELL DEPTHS
SUTTER COUNTY GROUNDWATER MANAGEMENT PLAN
FEBRUARY 2012

NORTH

0 3 6
MILES

SUTTER COUNTY CALIFORNIA

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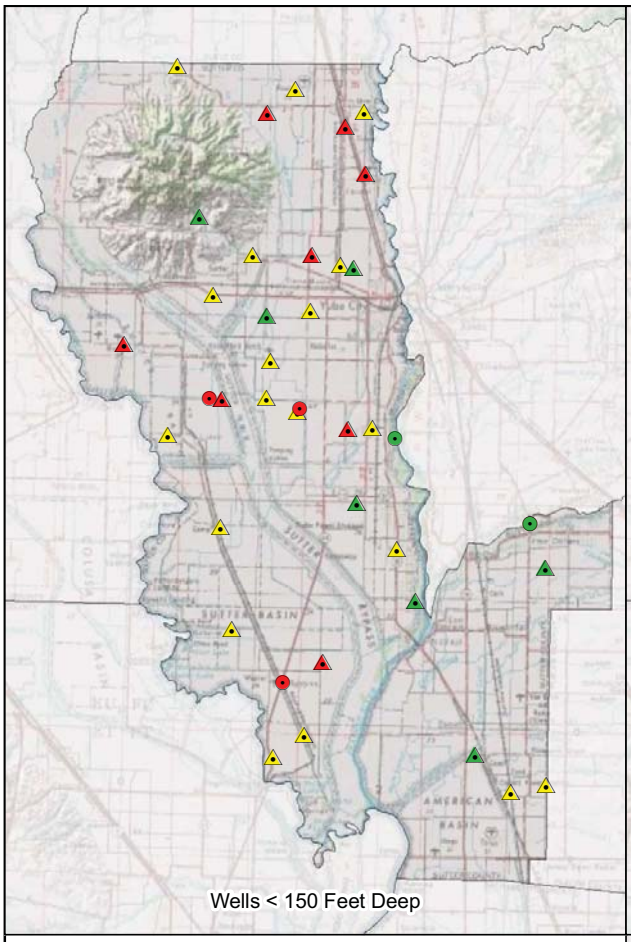
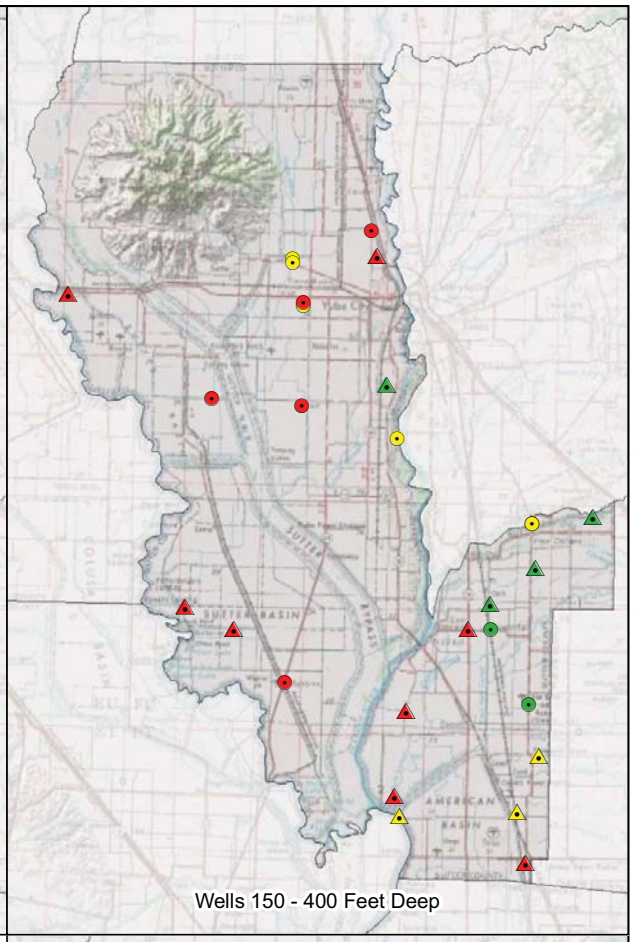
J:\Jobs\8337_SutterCounty\GIS\Tasks\20120201 Final Draft Figure Comments\Figure 22 Manganese_Well Depth.mxd 2/8/2012 3:23:15 PM bdemucha



Wells < 150 Feet Deep



Wells 150 - 400 Feet Deep

Arsenic in DWR Wells (µg/L)

- < 5
- 5 - 10
- > 10

Arsenic in USGS Wells (µg/L)

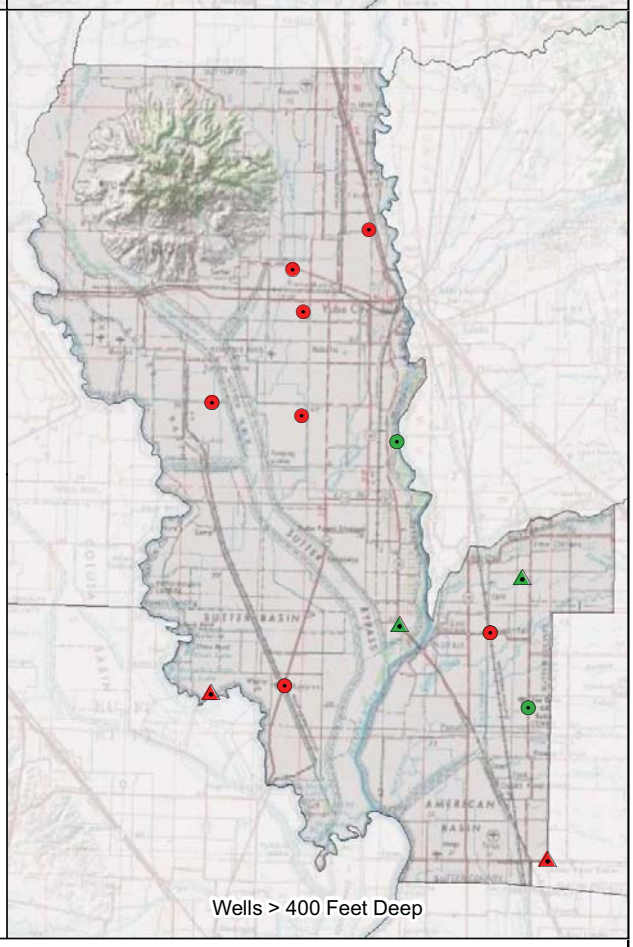
- < 5
- 5 - 10
- > 10

Note:
Arsenic is naturally occurring and leaches from aquifer materials into groundwater.

For public drinking water systems, the primary maximum contaminant level for arsenic is 10 micrograms/liter (µg/L).

Exposure to arsenic can cause both short and long term health effects. Long term exposure to arsenic has been linked to cancer of the bladder, lungs, skin, kidneys, nasal passages, liver and prostate. Short term exposure to high doses of arsenic can cause other adverse health effects.

Analysis for arsenic is very sensitive to turbidity of samples - turbid samples will often have artificially high results for arsenic.



Wells > 400 Feet Deep

SOURCES: USGS, DWR, SEWD, DHS, FAO, EPA

FIGURE 23
ARSENIC BY WELL DEPTHS
SUTTER COUNTY GROUNDWATER MANAGEMENT PLAN
FEBRUARY 2012

NORTH
0 3 6
MILES

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J:\Jobs\8337_SutterCounty\GIS\Tasks\20120116 Final Draft\Figure 23 Arsenic_Well Depth.mxd 2/8/2012 2:39:39 PM bdemucha

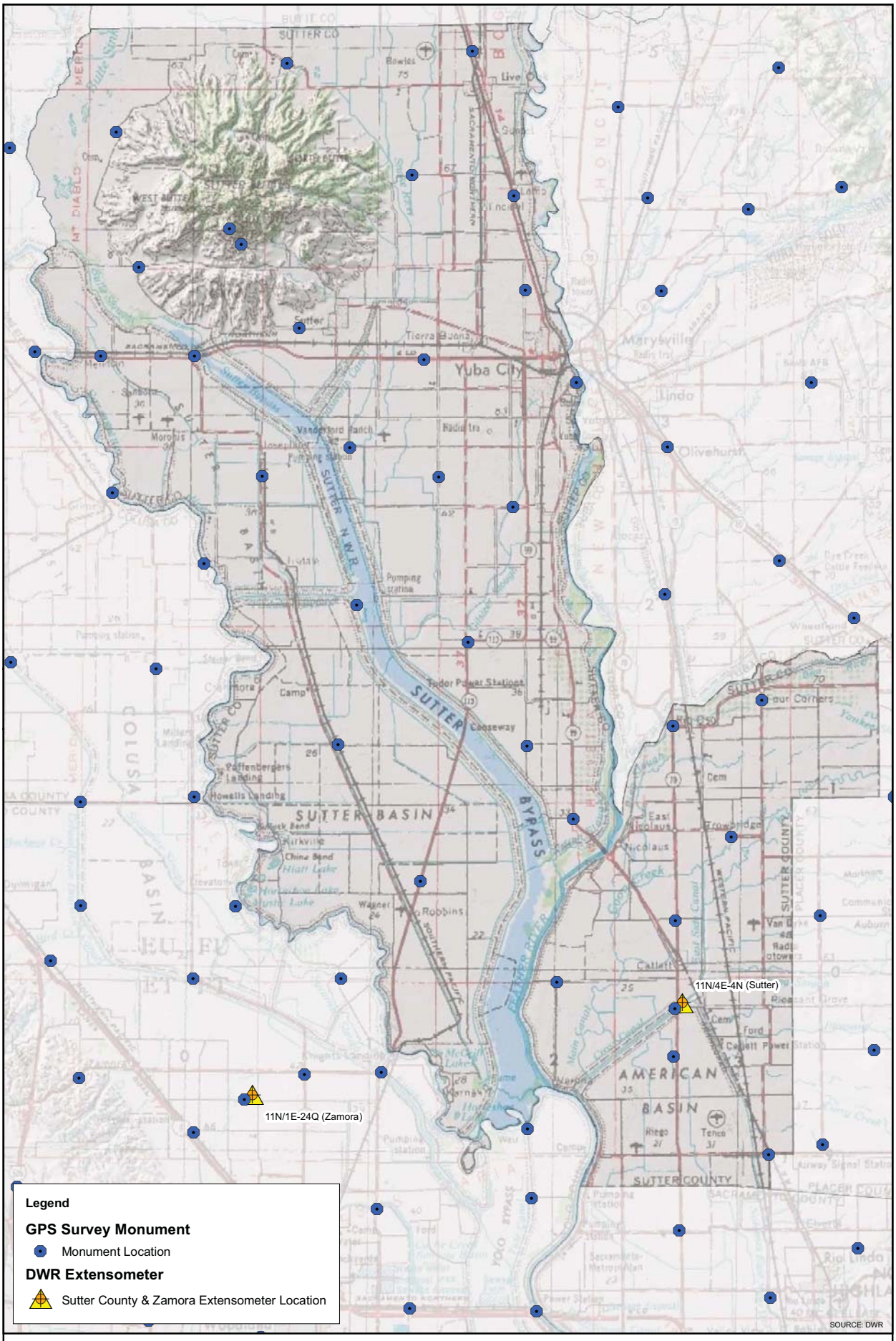

FIGURE 24
LAND SUBSIDENCE NETWORK
SUTTER COUNTY GROUNDWATER MANAGEMENT PLAN
FEBRUARY 2012

NORTH
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MILES

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J:\Jobs\8337_SutterCounty\GIS\Tasks\20120116 Final Draft\Figure 24 Land Subsidence Network.mxd 2/8/2012 2:43:42 PM bdemucha

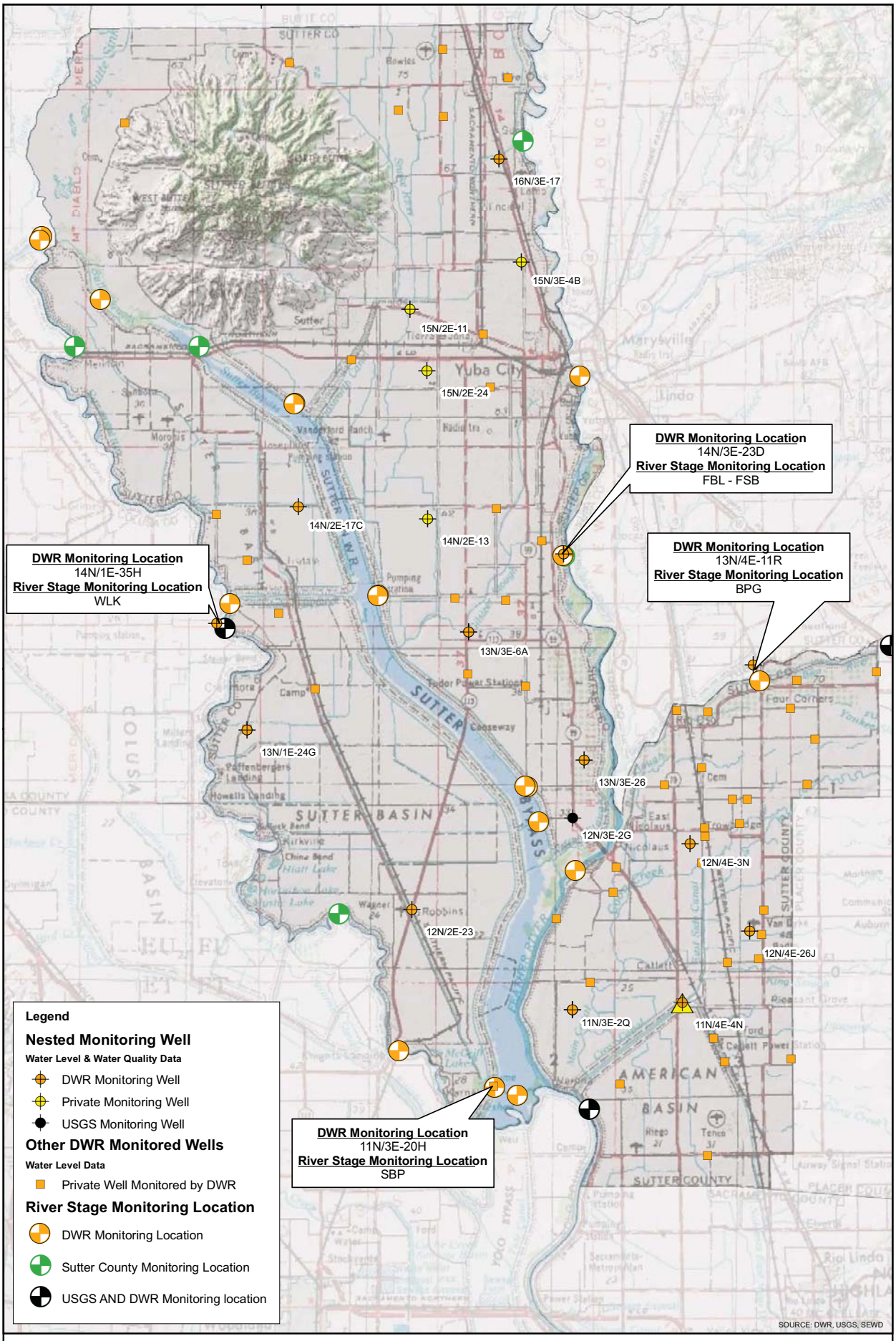

FIGURE 25
GROUNDWATER AND RIVER STAGE MONITORING LOCATIONS
SUTTER COUNTY GROUNDWATER MANAGEMENT PLAN
FEBRUARY 2012

NORTH
0 1.5 3
MILES

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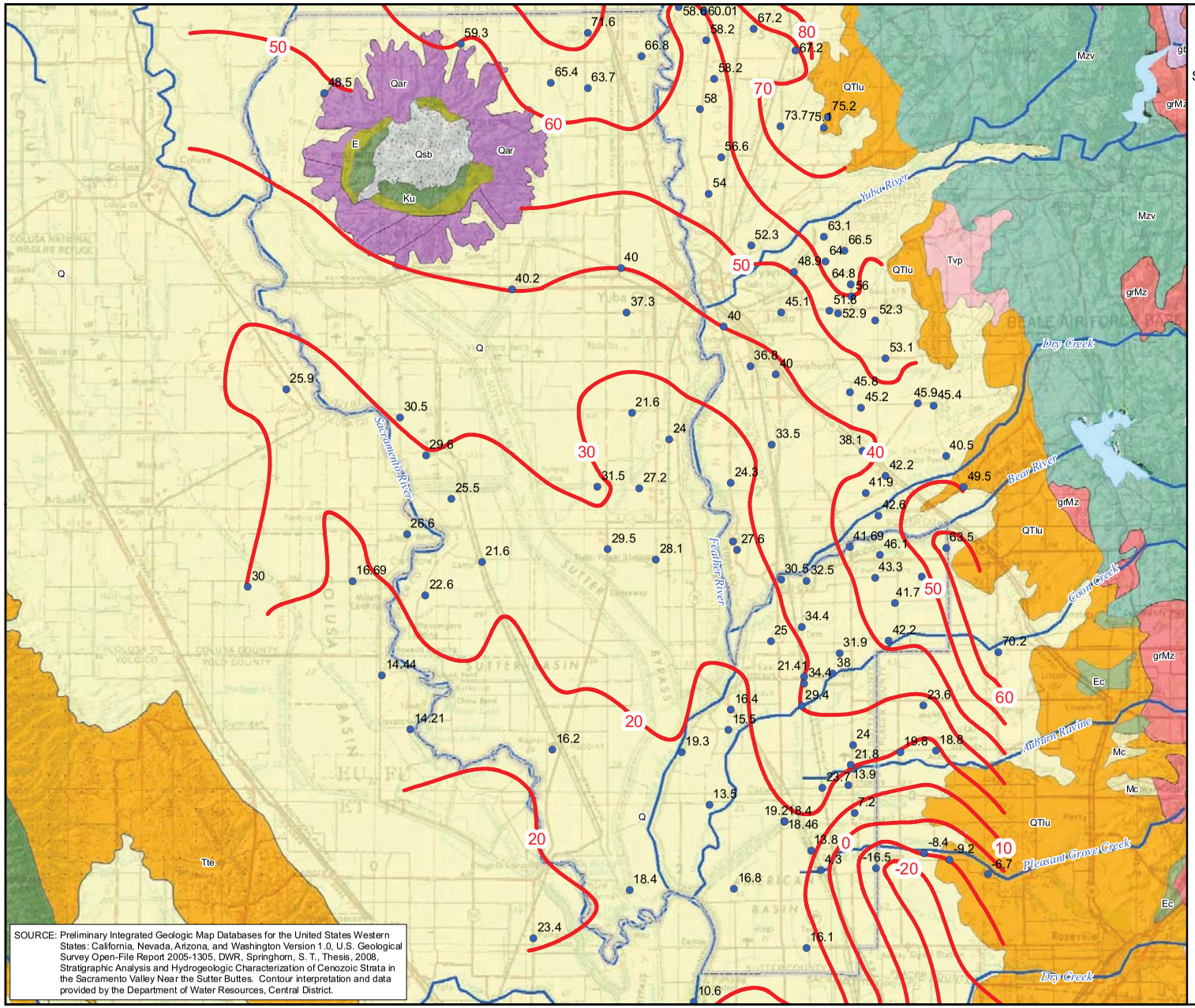
J:\Jobs\8337_SutterCounty\GIS\Tasks\20120116 Final Draft\Figure 25 Groundwater and River Stage Monitoring Locations.mxd 2/8/2012 2:46:51 PM bdemucha

FIGURE 26

RECHARGE AND GROUNDWATER ELEVATION CONTOUR MAP SPRING, 2009

SUTTER COUNTY GROUNDWATER MANAGEMENT PLAN
FEBRUARY 2012



SOURCE: Preliminary Integrated Geologic Map Databases for the United States Western States: California, Nevada, Arizona, and Washington Version 1.0, U.S. Geological Survey Open-File Report 2005-1305, DWR, Springhorn, S. T., Thesis, 2008, Stratigraphic Analysis and Hydrogeologic Characterization of Cenozoic Strata in the Sacramento Valley Near the Sutter Buttes. Contour interpretation and data provided by the Department of Water Resources, Central District.

NORTH

0 2 4
MILES

- Q - Recent Deposits
  - Qb - Basin Deposits
  - Qm - Modesto Formation
  - Qr - Riverbank Formation
- Qsb - Sutter Buttes Igneous Rocks
- Qar - Sutter Buttes Andesitic Rampart
- QTlu - Laguna Formation
- Tte - Tehama Formation
- Tvp - Andesite, Rhyolite
- Mc - Sandstone, Conglomerate
- Ec - Conglomerate, Sandstone
- E - Mudstone, Sandstone
- Ku - Sandstone, Mudstone
- J - Mudstone, Sandstone, & Slate
- um - Serpentinite
- Mzv - Volcanic, Metavolcanic
- gb - Gabbro, Diorite
- grMz - Granodiorite
- Sutter County
- DWR Monitored Wells Used for Contours
- Groundwater Contour of Equal Elevation (Feet, NGVD 29)

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J:\Jobs\8337_SutterCounty\GIS\Tasks\20120116 Final Draft\Figure 26 Recharge and Groundwater Elevation Contour Map Spring, 2009.mxd 2/8/2012 3:11:15 PM bdemucha

Figure 27
Sutter County
Well Construction By Year

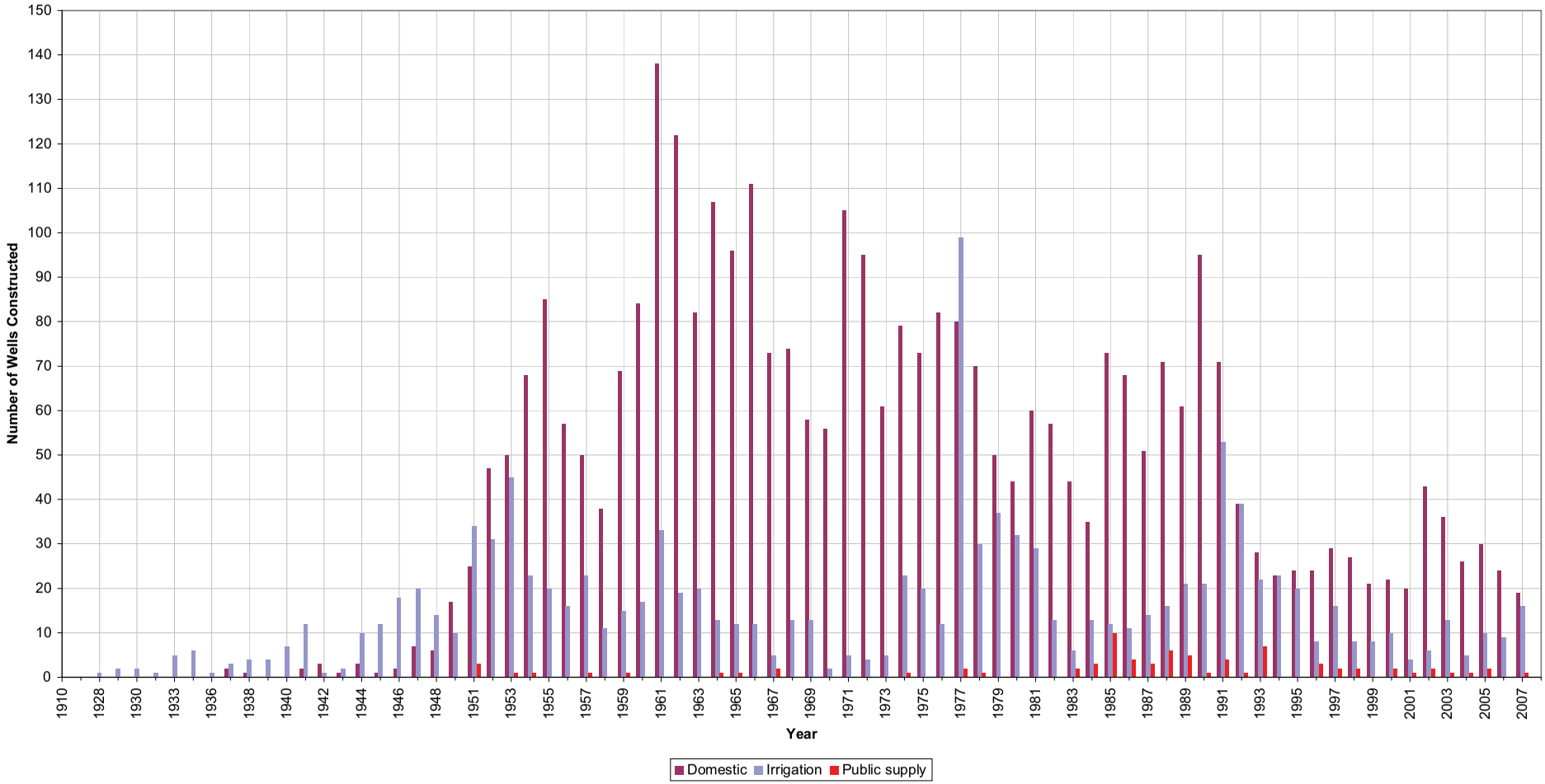

Figure 28
Sutter County
Historic Well Construction by Depth
and Annual Precipitation