Chapter 19. Hazards

BACKGROUND

Flooding

The Planning Area is drained by Putah Creek, Dry Slough, and the Willow Slough Bypass. The old North Fork of Putah Creek east of Interstate 80 no longer contains flowing water because it has been diverted into the South Fork for flood control. The South Fork of Putah Creek runs through the UC Davis campus eastward and terminates in the Putah Creek Sinks, located in the Yolo Bypass at the eastern edge of the Planning Area. Groundwater is naturally recharged in this area.

The California Department of Water Resources maintains the Willow Slough Bypass, which directs water away from Willow Slough and Dry Slough, in the eastern section of the Planning Area, and carries water eastward to the Yolo Bypass at the eastern boundary of the Planning Area. Willow Slough drains the valley floor between Putah and Cache Creeks. Agricultural runoff contributes water to the slough during irrigation season. Dry Slough, which forks with Willow Slough in Plainfield, has an intermittent flow. The Yolo Bypass, which runs north-south, is flooded when the Sacramento River carries high stormwater runoff levels. Water is released into the Bypass from the Fremont Weir located downstream from Knight's Landing.

Figure 35 shows areas known to be subject to flooding in the Planning Area. This map represents a combination of information from the adopted 1987 National Flood Insurance Map from FEMA, a 1997 draft update of FEMA data for the west side of Davis and a 1992 update of information from the "Covell Drainage System Comprehensive Drainage Plan" prepared by Borcalli Associates for the Yolo County Flood Control and Water Conservation District. This study addressed the problems of drainage and flooding in the Covell Drain system, which includes Willow Slough, Dry Slough, the Covell Drain, the Willow Slough Bypass and the Yolo Bypass.

Flood hazards shown in Figure 35 generally consist of shallow sheet flooding caused by surface water runoff during large rain storms. Flooding could be caused by creeks and other waterways overflowing their banks along Putah Creek, Willow Slough, Dry Slough, and the edge of the Yolo Bypass.
Davis is also in the path of flooding that would occur in the event of the failure of Monticello Dam on Putah Creek (Lake Berryessa). An inundation map prepared by the Bureau of Reclamation to analyze the effects of dam failure shows that the flooding in Davis would not be significantly greater than in a 100-year flood. This is because of the 23-mile distance between the dam and Davis.

The city's Public Works Department currently maintains (or contracts for the maintenance of) three main channels and three detention ponds which provide for drainage and storm water detention. A fourth pond, the North Stonegate Detention Pond, is operated by a local maintenance association. Maintenance of the channels includes removal of silt, control of weeds, and removal of brush. The Public Works Department also operates drainage pump stations.

Flood control services outside of the City are provided by the Yolo County Flood Control and Water Conservation District and the State Department of Water Resources. The Department of Water Resources has primary responsibility of maintaining the levees in the Planning Area.

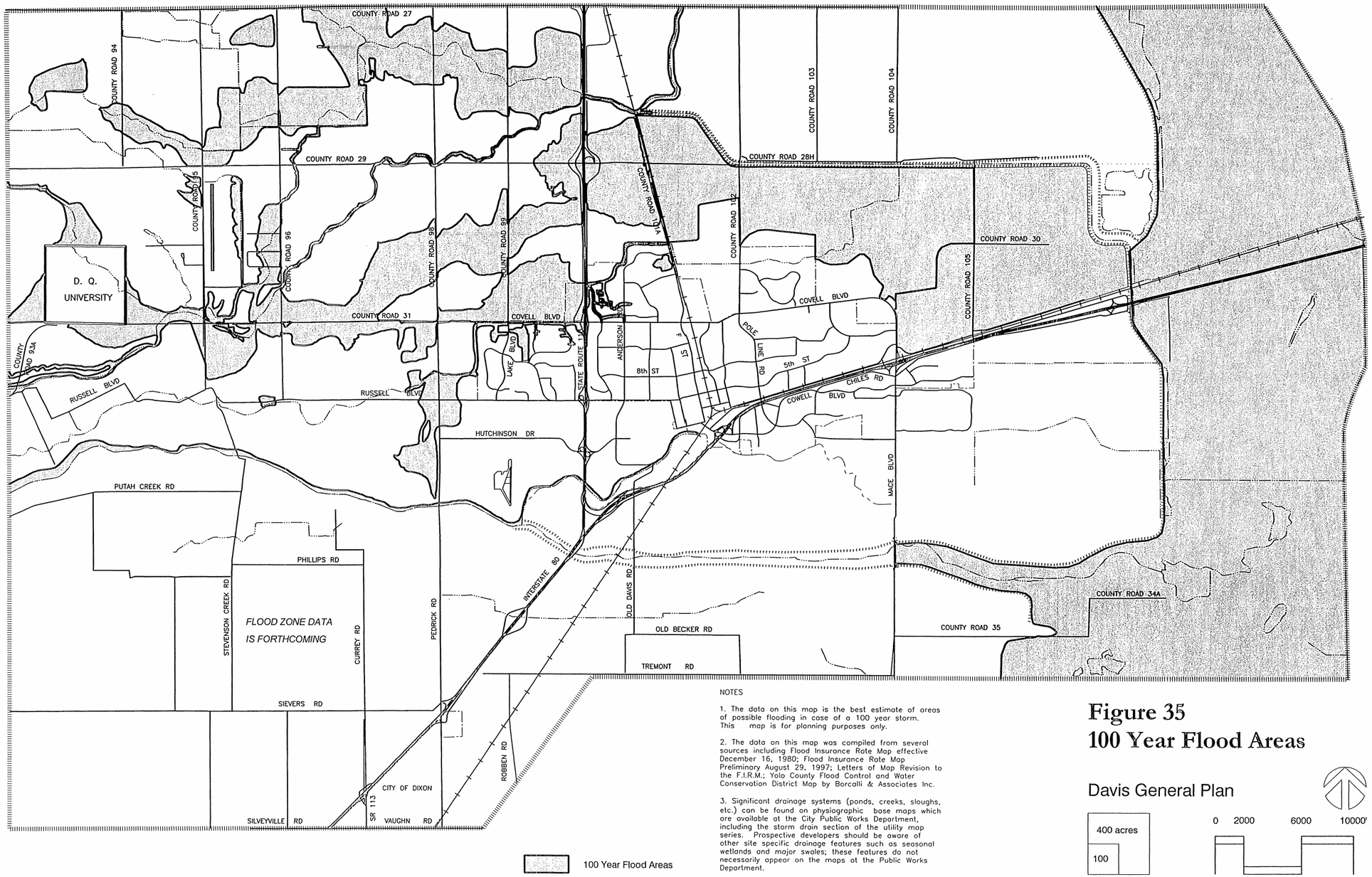
Geology and Soils

Davis is located in the eastern portion of the Putah Creek Plain, one of the major features of the southwestern Sacramento River valley. The land slopes at generally less than one percent, and elevations range from 60 feet above sea level in the west parts of the city to 25 feet in the east parts of the city. The foothills of the Coast Range are approximately fourteen miles to the west, and the Sacramento River is approximately eleven miles to the east.

Beneath the Sacramento Valley floor is a layer of metamorphic and igneous rock at depths greater than 17,000 feet. Atop this layer is a layer of marine and sedimentary rocks up to 15,000 feet thick. Neither of these layers bear water. The surface layers consist of up to 3,000 feet of water-bearing alluvial sediments, most of which are semi-consolidated, while only the uppermost layer, up to 200 feet deep, consists of unconsolidated alluvial deposits.

No earthquake faults run through the Planning Area, although the San Andreas fault system is to the west and the Eastern Sierra fault system is to the east. Numerous quakes along these faults have been felt in Davis. Major quakes occurred in 1833, 1868, 1892, 1902, 1906, and most recently in 1989, but Davis suffered no significant damage. The Office of Planning and Research has placed the Davis area in Seismic Activity Intensity Zone II, which indicates that the maximum intensity of an earthquake would be VII or VIII on the Modified Mercalli Intensity Scale. An earthquake of such magnitude would result in "slight damage in specially designed structures; considerable in ordinary substantial buildings, with partial collapse; great in poorly built structures." The Uniform Building Code places all of California in the zone of greatest earthquake severity because recent studies indicate high potential for severe ground shaking.

Due to a high proportion of silt and clay, the soils in the Planning Area are only moderately or slowly permeable, which hinders drainage and ground water recharge. Erosion hazards are "none to slight." Shrink-swell potential, which is the potential for soil to expand and contract due to moisture and temperature, is predominantly "moderate to high."



NOTES

1. The data on this map is the best estimate of areas of possible flooding in case of a 100 year storm. This map is for planning purposes only.

2. The data on this map was compiled from several sources including Flood Insurance Rate Map effective December 16, 1980; Flood Insurance Rate Map Preliminary August 29, 1997; Letters of Map Revision to the F.I.R.M.; Yolo County Flood Control and Water Conservation District Map by Borcalli & Associates Inc.

3. Significant drainage systems (ponds, creeks, sloughs, etc.) can be found on physiographic base maps which are available at the City Public Works Department, including the storm drain section of the utility map series. Prospective developers should be aware of other site specific drainage features such as seasonal wetlands and major swales; these features do not necessarily appear on the maps at the Public Works Department.

Figure 35
100 Year Flood Areas

Davis General Plan

400 acres
100

0 2000 6000 10000'

Disaster Planning

The City of Davis Fire Department maintains the City's Multi-Hazard Functional Planning Guide, which plans for emergency management and evacuation in the event of disasters. According to the departments, the most likely disaster scenario for Davis is a toxic spill on Interstate 80 or the Southern Pacific mainline railroad tracks passing through town. Other disasters could occur, such as a flood, an earthquake or a major fire.
The Guide includes operating procedures in the event of a disaster, as well as descriptions of emergency evacuation routes in Davis. According to the guide, all major roads are available for evacuation, depending on the location and type of emergency that arises. Major roads identified for evacuation in the Guide are Russell Boulevard, Highway 113, Interstate 80, Richards Boulevard, Road 102/Pole Line Road, Mace Boulevard southbound, Road 32A, Covell Boulevard/Road 31, "F" Street and North Sycamore Frontage Road.

Hazardous Materials

The 1995 *Annual Report on Hazardous Waste Sites in the Davis Area*, prepared by the Natural Resources Commission and submitted to the Davis City Council, contains status reports on eight identified hazardous waste sites in the city. Of the eight sites, four are underground tank sites at former gas stations and one is an underground tank site at an operational gas station. The remaining three sites are located on government or former industrial lands. The contaminants at these sites include gasoline constituents, solvents, pesticides, herbicides and other chemical compounds which have the potential to affect both soil and water. The condition and level of remediation at these sites varies greatly from approval of work plans to remediation being nearly complete. Regulatory agencies which monitor sites in the City include the toxic substances control departments of both the State of California and the U.S. Environmental Protection Agency, the Regional Water Quality Control Board, and the Yolo County Department of Environmental Health.

The City is committed to continued monitoring of water contamination in the vicinity of the abandoned Davis Land fill site located on the west side of Pole Line Road north of the City.

The City's Fire Department, with the assistance of the Public Works Department, responds to all types of spills or illegal disposal. The Yolo County Department of Environmental Health and Safety is responsible for enforcing compliance with the disclosure requirements for all businesses handling hazardous materials in amounts equal to or greater than the State threshold quantities. The Yolo County Public Works Department, in conjunction with the City's Public Works Department, are responsible for the Davis Household Hazardous Drop Off and the Small Quantity Generator programs.

The City has developed an Integrated Pest Management program, in which an insect or weed pest are managed in an ecosystem context. As an alternative to the conventional use of pesticides and herbicides, the city implements the program at city facilities, including parks and greenbelts. In addition, the city has recently created an Integrated Pest Management Task Force to further analyze these issues and programs.

Electromagnetic Fields

Over the past decade, public health concerns have been raised regarding electromagnetic fields (EMFs) emanating from high tension power lines and other public electrical facilities. There has been a great deal of research about EMFs over the past several years, but there have been no definitive conclusions from this research.

EMFs are imperceptible energy emissions located at the low end of the electromagnetic spectrum, produced by alternating current as it surges in electric wires. As the term "electromagnetic" suggests, EMFs have two components, an electric charge and a magnetic attraction. Low-frequency EMFs are less blatantly damaging to living cells than higher-frequency forms of radiation such as x-rays, microwaves, or ultraviolet rays, which contain more energy.

It is very difficult to determine what subtle effects, if any, low-frequency fields may have on living tissue over long periods. Some researchers believe that exposure to EMFs could have health consequences for humans, while others disagree.

GOALS, POLICIES AND ACTIONS

FLOOD SAFETY

GOAL HAZ 1. Provide flood protection which minimizes potential damage, while enhancing recreational opportunities and wildlife habitats and water quality.

Policy HAZ 1.1 Site and design developments to prevent flood damage.

Standards

a. No development may occur in flood-prone areas, including all areas below an elevation of 25 feet, unless mitigation of flood risk is assured. Any mitigation proposed by the project proponent to mitigate flood risks shall demonstrate that the mitigation/design does not adversely impact other properties.

b. Development shall not increase flood hazards or reduce the effectiveness of existing flood-control facilities.

c. New development shall be designed to include measures to protect structures from a 100-year flood.

d. New development shall include stormwater detention or retention ponds and other facilities, if necessary, to prevent flooding by surface-water runoff.

Actions

e. Adopt and revise as needed a local Flood Plain Management Ordinance.

f. Work with FEMA to update FEMA flood maps of the city.

g. Update the flood zone map whenever land is annexed to the city.

h. Evaluate the effects of development proposals on upstream and downstream flooding and drainage courses.

i. Develop a City Disaster Plan that considers actions in the case of failure of Monticello Dam on Lake Berryessa, or failure of levees along the Yolo Bypass.

j. Promote the protection and increase in capacity of the regional flood control system to accommodate both existing and planned development.

Policy HAZ 1.2 Continue to provide flood control improvements that are sensitive to wildlife habitat and open space preservation .

Action

a. When designing new or retrofitted flood control facilities, include wildlife and/or public open space facilities in them to the extent possible.

GEOTECHNICAL SAFETY

GOAL HAZ 2. Minimize risks associated with soils, geology and seismicity in Davis.

Policy HAZ 2.1 Take necessary precautions to minimize risks associated with soils, geology and seismicity.

Standards

a. A soils report shall be required for development sites where soils conditions are not well known, as required by the Planning and Building or Public Works departments.

b. As a condition of approval of development, mitigation of any identified soils hazards shall be required.

Actions

c. Continue to update and enforce Building Code requirements for seismic and geologic safety and to address ground shaking and ground failure.

d. Continue to monitor studies of seismic activity in the region, and take appropriate action if significant seismic hazards, including earthquake faults, are discovered in the planning area.

DISASTER PLANNING

GOAL HAZ 3. Provide for the safety and protection of citizens from natural and environmental hazards.

Policy HAZ 3.1 Provide for disaster planning.

Actions

a. Continue to maintain and update the City's Multi-Hazard Functional Planning Guide.

b. Publicize the Multi-Hazard Functional Planning Guide.

c. Train appropriate city staff in the use of the Multi-Hazard Functional Planning Guide and in emergency response responsibilities.

TOXICS

GOAL HAZ 4. Reduce the use, storage and disposal of toxic and hazardous substances in Davis, and promote alternatives to such substances and their clean up.

Policy HAZ 4.1 Reduce and manage toxics within the planning area.

Actions

a. Before construction starts, a project proponent will submit a hazardous materials management plan for construction activities that involve hazardous materials. The plan shall discuss proper handling and disposal of materials used or produced onsite, such as petroleum products, concrete, and sanitary waste, shall be established prior to the commencement of construction-related activities, and shall be strictly enforced by the project proponent. A specific protocol to identify health risks associated with the presence of chemical compounds in the soil and/or groundwater and identify specific protective measures to be followed by the workers entering the work area. The City of Davis will make available up-to-date information on known hazardous waste sites if the presence of hazardous materials is suspected or encountered during construction-related activities, the project proponent shall complete a Phase I or Phase II hazardous materials study for each identified site.

b. Continue to study and implement programs through the city's Natural Resource Commission to minimize hazardous material use and exposure.

c. Continue to cooperate with Yolo County agencies in implementing State laws relating to the use of hazardous materials, including the review of "business plans" for businesses using hazardous materials.

d. Create and enforce zoning regulations regarding siting and permitting of businesses that handle hazardous materials.

e. Periodically review the Zoning Ordinance and revise it as needed to ensure high environmental quality.

f. Develop an enforcement program to maintain a high level of compliance with hazardous materials regulations.

g. Provide persons and small businesses within the planning area with environmental information or audits to help them conserve resources, energy, reduce toxics and waste, and provide general education on how to run an environmentally friendly business or household.

h. Educate owners of business with operations potentially polluting groundwater as to appropriate management practices.

i. In cooperation with local agricultural interests and the agricultural commissioners from the counties of Solano and Yolo, work toward voluntary reduction or elimination of aerial and synthetic chemical application in areas adjacent to the city.

Policy HAZ 4.2 Provide for the proper disposal of hazardous materials in Davis.

Actions

a. Continue the program to educate residents on the negative impacts of dumping hazardous materials in driveways, streets, and drains.

b. Continue programs aimed at ensuring that household hazardous wastes and small generator commercial wastes are not disposed of in the general waste stream.

c. Continue and expand the household hazardous waste collection and recycling program and the small quantity generator program.

d. Work with the County to establish a permanent household hazardous waste collection facility.

e. Develop and adopt a pressure treated timber disposal ordinance.

f. Maintain used oil drop-off sites.

Policy HAZ 4.3 Reduce the potential for pesticide exposure for people, wildlife and the environment.

Actions

a. Develop and adopt an Integrated Pest Management Ordinance . The ordinance should consider the impacts that City pesticide applications may have on wildlife.

b. Develop a program to encourage alternatives to the use of pesticides and herbicides and practice integrated pest management strategies.

c. Reduce the potential for pesticide spray drift to impact Davis residents.

Policy HAZ 4.4 Increase awareness of agricultural chemical use impacting Davis residents.

Actions

a. Develop a program to inform Davis home buyers, homeowners and renters of all City or county right to farm ordinances and their property's proximity to agricultural lands or other lands that are subject to pesticide or other chemical applications.

Policy HAZ 4.5 Minimize impacts of hazardous materials on wildlife inhabiting or visiting the Davis area.

Actions

a. Monitor sediments and water quality in areas used by wildlife for pesticides, heavy metals and other contaminants, and establish base line data.

Note: See Standard HAB 1.2b.

Policy HAZ 4.6 Increase awareness of asbestos in the community.

Actions

a. Notify City water customers yearly of City water quality test results regarding asbestos content. Notification shall also include notice to water customers whose water is delivered through pipes made of asbestos containing materials.

b. The city's building inspection division should maintain a list of some of the typical materials containing asbestos and of businesses that are licensed to do asbestos testing.

Policy HAZ 4.7 Ensure that remediation of hazardous waste sites is conducted in the most timely and environmentally responsible manner possible.

Actions

a. Maintain an enforcement program to ensure that all releases of hazardous materials are promptly and appropriately cleaned up to the level required by law.

b. Proactively work with site owners and state and federal agencies to expediently clean up hazardous materials sites.

c. In hazardous material remediation projects, injection wells shall only be permitted for aiding in cleanup of State or Federally recognized contaminated sites, and for no other disposal purpose.

COMBINED POLLUTANTS

GOAL HAZ 5. Reduce the combined load of pollutants generated in the City by 30 percent by the year 2010.

Policy HAZ 5.1 Reduce the combined load of pollutants generated in the City's wastewater, stormwater and solid waste streams. Such pollutants include, but are not limited to toxic and hazardous substances.

Action

a. Maintain and enhance existing programs, and develop new programs, to reduce the City's combined load of pollutants.

ELECTROMAGNETIC FIELDS

GOAL HAZ 6. Monitor research regarding the health effects of electromagnetic fields, maintain a public information program on the current state of knowledge about EMF, and make this information available to all citizens.

Policy HAZ 6.1 When there are issues of public concern regarding EMF, encourage efforts to minimize exposure to EMF when this can be accomplished with reasonable planning and investment.

Actions

a. Consider establishing EMF exposure standards if they are suggested in the future by appropriate state and federal agencies.

b. Continue to monitor research and policy developments concerning EMF.