

MERCED COUNTY UNIVERSITY COMMUNITY PLAN  
POLICY DISCUSSION PAPER

Public Safety and Hazards: Seismic,  
Geologic, Flooding, and Hazardous  
Materials

*For CPAC Discussion: May 24, 2001 Meeting*

**INTRODUCTION**

This policy discussion paper presents a general outline of the issues associated with seismic and geologic hazards, flooding, and hazardous materials, for inclusion in the Public Safety element of the Merced County University Community Plan (UCP), and discusses policy options for each issue. The report is presented for discussion purposes only and will be updated and refined based on continuing analysis and stakeholder input.

**EXISTING CONDITIONS AT THE UCP AREA**

*Seismic and Geologic Hazards*

*Seismicity and Groundshaking*

There are no active or potentially active faults on the UCP area. As such, the proposed UCP would not be subject to fault rupture or any special development standards associated with Alquist-Priolo Earthquake Fault Zoning Act requirements. According to the most recent estimates published by the California Department of Mines and Geology, the area of California where the UCP area is located has a low potential for strong seismic groundshaking. Primary effects of seismic activity are not expected to occur at the UCP area unless an unknown or buried fault was to rupture.

*Expansive Soils*

Expansive soils (i.e., clay or silt) are those that greatly increase in volume when they absorb water (swell) and shrink when they dry out. Expansion can cause damage to building foundations, concrete slabs, hardscape, pavement, underground utility lines, and other surface or near-surface improvements. Expansive soils are located throughout the UCP area.

*Liquefaction*

Liquefaction is a phenomenon whereby granular material is transformed from a solid state into a liquid state as a result of an increase in pore-water pressures due to an earthquake. Liquefaction can also occur in low-lying areas that are comprised of unconsolidated, saturated, clay-free sands and silts. The primary factors deciding liquefaction potential of soils are: (1) the level and duration of seismic ground motions; (2) the type and consistency of the soils; and (3)

the depth to groundwater. No specific liquefaction hazard areas have been identified in Merced County; however, this potential exists throughout the San Joaquin Valley where unconsolidated sediments and a high water table coincide. The UCP area has a high groundwater table, and the soils at the UCP area vary from gravelly soils to tight clay and hardpan.

### *Slope Stability*

The majority of the UCP area is occupied by gently rolling flatland that rarely reaches 10 percent slopes. Given the granular, clayey, and relatively consolidated and cemented nature of the soils, the near-surface hardpan, and the gentle slopes throughout the site, the UCP area is not prone to landsliding.

### *Flooding Hazards*

None of the watercourses at the UCP area have been designated as a 100-year flood hazard zone by the Federal Emergency Management Agency (FEMA). Areas adjacent to Rascal Creek on the east side of the Fairfield Canal (not within the UCP area) are within FEMA's 100-year floodplain; however, all of the floodwater generated from this area enters the Rascal Creek Diversion Channel and drains directly into Bear Creek.

The UCP area is not located within the inundation zone of Lake Yosemite Dam, and therefore, would not be affected by floodwaters if the dam were to unexpectedly fail. However, due to the presence of the Le Grand Canal and Fairfield Canals at the UCP area, if the levees retaining the canal water were to fail, residents and structures at the UCP area would be subject to flood conditions. The amount of water in the canals varies with the season. An additional volume of water would be expected in the canals during the irrigation season, and during the rainy season.

### *Hazardous Materials*

According to a survey of federal, State, and local hazardous materials databases sites, none of the facilities located within the UCP area boundaries or adjacent to the UCP area have been identified as having known soil or groundwater contamination that has not been properly remediated and approved by the appropriate regulatory agencies.

Within the boundaries of the UCP area, Hunt Farms was identified as having registered underground storage tanks (USTs) containing gasoline on the property; however, the USTs are not known to have leaked onto the soil. Several other sites within a one-half mile radius of the UCP area were also identified on various regulatory database lists, but no known contamination has been reported. The sites near the UCP area generally consist of residential or farm properties that store gasoline or photoprocessing chemicals. The closest site to the UCP area that is reported to have had soil and groundwater contamination is the General Electric/Kendal Plant site located at 1715 Kibby Road. This location is approximately one-mile south of the UCP area and is hydrologically downgradient of the UCP area (opposite groundwater flow direction), and would not be expected to affect the environmental condition of the UCP area. Any existing groundwater contamination originating from the General Electric/Kendal Plant site would generally migrate towards the south or southwest.

## **EXISTING REGULATORY SETTING**

According to federal, State, and local requirements, construction of the proposed UCP would be required to comply with, at minimum, the following laws and regulations.

### *Seismic and Geologic Hazards*

#### *California Building Code*

The State of California provides minimum standards for seismic structural design and site development through the California Building Standards Code (California Code of Regulations [CCR], Title 24). The California Building Code (CBC) is based on the Uniform Building Code (UBC) used widely throughout United States, and has been modified for California conditions with numerous more detailed and/or more stringent regulations.

The State earthquake protection law (California Health and Safety Code 19100 *et seq.*) requires that structures be designed to resist stresses produced by lateral forces caused by wind and earthquakes. Specific minimum seismic safety and structural design requirements are set forth in Chapter 16 of the UBC/CBC. The UBC/CBC identifies seismic factors that must be considered in structural design.

Chapter 18 of the UBC/CBC regulates the excavation of foundations and retaining walls, and Appendix Chapter A33 regulates grading activities, including drainage and erosion control, and construction on unstable soils, such as expansive soils and liquefaction areas.

The Seismic Hazards Mapping Act of 1990 (Public Resources Code Section 2690-2699.6) addresses seismic hazards other than surface rupture, such as liquefaction and seismically induced landslides. The Seismic Hazards Mapping Act specifies that the lead agency or a project may withhold development permits until geologic or soils investigations are conducted for specific sites and mitigation measures are incorporated into plans to reduce hazards associated with seismicity and unstable soils.

#### *Merced County Building Codes and Regulations*

According to the Merced County Building Codes and Regulations, Merced County Building Ordinance No. 1539 states that federal and State mandated codes and/or regulations shall be followed, in addition to the following Uniform Codes: Uniform Building Code; Uniform Housing Code; Uniform Code for Abatement of Dangerous Buildings; Uniform Mechanical Code; Uniform Plumbing Code; and National Electrical Code.

### *Flooding Hazards*

FEMA allows residential and non-residential development within a floodplain; however, construction activities are restricted within the flood hazard areas depending upon the potential for flooding within each area. Federal regulations governing development in a floodplain are set

forth in Title 44, Part 60 of the Code of Federal Regulations (CFR). These standards are implemented at the State level through construction codes and local ordinances; however, these regulations only apply to residential and non-residential structural improvements.

Chapter 18.128 of the Merced County Zoning Code (Flood Protection Ordinance) provides for the control and regulation of land use and structures within the various watersheds and their floodplain areas. In Merced County, the lowest flow of any habitable structure must be elevated above the base 100-year floodplain, as designated by FEMA. The UCP area, however, is not within FEMA's designated 100-year floodplain.

### Hazardous Materials

The management of hazardous materials and hazardous wastes in Merced County occurs within the context of a complex interaction of federal, State, and local requirements. Federal laws governing the transport, storage, and use of hazardous materials include the following:

- Resources Conservation and Recovery Act (RCRA) - hazardous waste management;
- Hazardous and Solid Waste Amendments Act (HSWA) - hazardous waste management;
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) - cleanup of contamination;
- Superfund Amendments and Reauthorization Act (SARA) - cleanup of contamination; and
- Emergency Planning and Community Right-to-Know (SARA Title III) – business inventories and emergency response planning.

Specific requirements for implementation of these federal statutes are codified in Title 40 of the CFR. Additional regulations that apply to workplace safety and transportation of hazardous materials are contained in CFR Titles 29 and 49, respectively.

State regulations applicable to hazardous materials are contained primarily in Title 22 of the CCR. Title 26 of the CCR is a compilation of those chapters or titles of the CCR that are applicable to hazardous materials management.

Hazardous materials management within Merced County would be the primary responsibility of the Division of Environmental Health, and all project developers of the proposed UCP would be required, per federal, State, and local laws, to comply with hazardous materials management regulations.

### Merced County General Plan

The Safety Chapter of the Merced County General Plan contains numerous goals, objectives, and policies that provide direction and regulatory mechanisms designed to protect residents and structures against hazards associated with seismic events, unstable soils and geologic hazards, and flooding associated with 100-year storm events and dam failure.

There are no goals or policies in the General Plan that specifically regulate hazardous materials in Merced County. The Land Use Section of the General Plan indicated that Merced County adopted a State mandated Hazardous Waste Management Plan, which was in the process of being approved by the State Department of Health Services. The preliminary hazardous materials management goal of that plan is to, “Protect the health and welfare of the public, environment, and the economy of Merced County through a comprehensive countywide program to ensure the safe and efficient management of hazardous waste.”

In addition, while the General Plan specifically indicates that, “people should be free from unacceptable risks resulting from dam failure,” there is no consideration for risks associated with levee failure.

## **SUGGESTED GOALS AND POLICIES FOR THE PROPOSED UCP**

### *Seismic and Geologic Hazards*

The Policy Discussion Paper titled, “Environmental Resource Management: Geology and Soils” (reviewed at the May 10 CPAC meeting) presents policy options that should be considered to ensure that people and structures at the UCP area are protected against hazards associated with seismic events and unstable soils. Most of these policies include completing site-specific soil and geotechnical investigations and following site development standards provided in the CBC and UBC.

### *Flooding Hazards*

Issue: Ensure that the UCP area is protected against flood hazards associated with the unexpected failure of the Fairfield Canals or Le Grand Canal levees.

The Merced County General Plan considers flooding impacts associated with 100-year storm events and the failure of dams. However, significant development and construction activity for the proposed UCP will be occurring around the Fairfield and Le Grand Canals, which would increase the potential for structural damage to the canals, directly increasing the potential for levee failure and flooding. In addition, development throughout the UCP area will create additional impervious surfaces, which will increase the volume of water that can be intercepted into the Fairfield Canal, potentially creating flooding situations. In response to the Notice of Preparation of Environmental Impact Report for the University Community Plan, Merced Irrigation District (MID) proposed that numerous conditions be considered as mitigation for the canals on the UCP area. MID also noted in their Notice of Preparation comment letter that MID operates and maintains a 100-foot wide combination of easements and fee-title strips along the Fairfield Canal, and a 150-foot wide easement along the Le Grand Canal. MID also maintains a 60-foot wide easement along the Fairfield Lateral “A” and the Dunn Lateral, which are smaller diversion channels within the UCP area. Potential flooding conditions could affect both MID property and the UCP area.

The following policy options are adopted from MID’s concerns and should be considered for the proposed UCP. Many of MID’s concerns regarding the canals at the UCP area are incorporated

into the *Water-Related Infrastructure Systems* policy discussion paper, since the canals are proposed to be used in the UCP area's stormwater drainage system.

Policy Option 1: Ensure that the structural integrity of the on-site irrigation canals is adequate to support projected water flows within the canals. If necessary, concrete liners can be installed in the canals, or the banks of the canal can be fortified or raised. A qualified engineer shall perform structural stability investigations, and make recommendations regarding reinforcement options. This shall be completed in concert with the stormwater drainage system design.

Policy Option 2: Development at the UCP area should not occur within an agreed-upon distance (County and MID to decide) from the toe of the canal's levee in order to protect the structural integrity of the canal system. MID currently maintains a 150-foot wide easement along the Le Grand Canal, a 100-foot wide easement along the Fairfield Canal, and a 60-foot wide easement along the Fairfield Lateral "A" and the Dunn Lateral.

#### *Advantages*

- Designing the stormwater drainage system in concert with reinforcing the canals will ensure that the systems are compatible.
- Structural reinforcements of the canals will reduce the potential for levee failure and flooding occurrence.
- By restricting development within a certain distance from the canals, potential damage to the canal's levees due to construction activity and continued occupation at the UCP area will be reduced.

#### *Disadvantages*

- MID or the County will be responsible for ensuring that the structural integrity of the canal and their levees is adequate to support projected water flows.

#### *Hazardous Materials*

Issue: Ensure that site development at the UCP area does not encounter unknown hazardous materials that would be a hazard to public health and safety and the environment.

The UCP area has historically been used for agricultural purposes, and there is the potential that the environmental quality of the UCP area has been adversely affected by ongoing pesticide and herbicide application or unknown hazardous materials disposal. Soil and/or groundwater at the UCP area may be contaminated as a result of past activities (as well as future activities), which could create a health hazard during site construction. Implementation of the following policy options would reduce the health and safety hazards associated with unknown hazardous materials at the UCP area.

Policy Option 1: Prior to site preparation and construction activities at the UCP area, a preliminary site investigation in accordance with ASTM Standard Practice E 1527-00 (or the most current site assessment standard) shall be conducted by an environmental professional to determine the potential for on- and off-site hazardous materials contamination. Environmental site assessments should be updated and revised every three years, or as required by ASTM standards.

Policy Option 2: If, during the preliminary site investigation, or during construction activities following completion of the site investigation, evidence of hazardous materials contamination is observed or suspected through either obvious or implied measures (i.e., stained or odorous soil, or oily or discolored water), construction activities shall cease and an environmental professional shall assess the situation. If necessary, the environmental professional shall prepare a sampling plan to collect soil and/or groundwater samples to determine whether or not the site has been adversely affected by past activities. The samples shall be analyzed for the contaminants determined to be a potential health concern by the environmental professional. Depending on the nature of the contamination (if any), the Merced County Division of Environmental Health shall be notified for further direction.

#### *Advantages*

- Environmental site assessments would identify the potential for soil and/or groundwater contamination at the UCP area.
- The environmental condition of the UCP area can change over time as new sources of hazardous materials are brought onto the area. The continued preparation of environmental site assessments would review and summarize the potential for contamination at UCP area.

#### *Disadvantages*

- An initial site assessment could be prepared for the entire UCP area prior to any development. However, as the UCP area becomes divided and developed in phases, and since buildout of the proposed UCP will occur over a period of time, each new development phase will be required to prepare a new environmental site assessment.

Issue: Ensure that hazardous materials and hazardous wastes throughout the UCP area are properly used, transported, stored, and disposed of in accordance with federal, State, and County regulations.

Hazardous materials and hazardous wastes are regulated at various levels of federal, State, and local governments by numerous agencies. Implementation of the following policy options would provides residents of the UCP area with the information needed for proper hazardous materials and hazardous waste management planning.

Policy Option 1: A “Hazardous Materials Management Plan” should be prepared to provide residential, commercial, and industrial properties with necessary information regarding the use, transportation, storage, and disposal of hazardous materials and hazardous wastes within the UCP area and Merced County.

Policy Option 2: Require that all projects within the proposed UCP comply with the Hazardous Materials Management Plan and the programs established by the Merced County Division of Environmental Health.

### *Advantages*

- The Hazardous Materials Management Plan would establish a formal set of guidelines and would educate people living and working within the UCP area.
- Even though hazardous materials are highly regulated, many people do not realize the health and safety issues associated with hazardous materials, such as combining certain household and commercial cleaning chemicals. The Merced County Division of Environmental Health has 32 established Environmental Health programs.

### *Disadvantages*

- Who is going to prepare the Hazardous Materials Management Plan?