5.3 FLOODING AND DRAINAGE

The study area lies within the watersheds of seven coastal streams. Storm water runoff from greenhouse and associated structures, as well as from open field agriculture, and residential areas is directed to the Valley's drainage channels. Flow capacity along most of the channel areas is limited and may result in flooding during peak storm events.

The proposed project could involve the buildout of an additional three million square feet of greenhouse~~s and associated structures~~development. Buildout of the structures would incrementally reduce the area of land available for natural infiltration of rainfall and additional runoff could potentially overburden the existing channels, causing additional flooding. Flood Control standard conditions, proposed development standards, and other mitigation measures have been developed to reduce potential flooding impacts in the study area.

5.3.1 Setting

a. Drainage System. Precipitation in the Carpinteria Valley averages 15-16 inches per year, with average annual rainfall increasing with elevation as the topography rises toward the Santa Ynez Mountains. The high flow period is typically between December and May. Generally, the drainage system to the Valley is young and has a steep gradient. Carpinteria's drainage characteristics (mountainous headwater areas and large areas of impermeable bedding planes near the land surface) make it prone to flooding (SBCo, 1986).

Flood waters originating from local mountainous watersheds and sediment transport and deposition have shaped and influenced the topography of the project area. High intensity storms cause rapid accumulation of runoff in steep canyons, and the storm flows transport rock and sediment to the flatter coastal plain. The heavier debris, such as large rocks and boulders, are deposited first as the flow velocity slows. As the streambed gradient and consequential flow velocity decreases, finer sands and silt are deposited in the creek bottoms, which can quickly reduce the channel capacity and flood adjoining low-lying areas during subsequent storm events. Local creeks generally experience flooding only during high intensity storms, especially those that follow in close succession. This is due to the saturation of the soil by predecessor storms, which causes subsequent rainfall to nearly completely runoff as overland surface flow. Factors that increase the runoff of rainfall from local soils include vegetation removal on steep slopes due to fire or grading, soil compaction due to agricultural practices, and the creation of impermeable surfaces associated with development.

Seven coastal streams drain the majority of the 7,196-acre study area, including Toro Creek, Garrapata Creek, Arroyo Paredon, Santa Monica Creek, Franklin Creek, Carpinteria Creek and Rincon Creek (Figure 5.3-1). Most of the creeks are naturally intermittent streams in their lower reaches, perennial in their upper watersheds, while Rincon Creek is perennial to the ocean. The Santa Monica and Franklin Creek watersheds both drain to the Carpinteria Salt Marsh and include substantial portions of the existing greenhouse development. Two other areas with greenhouse development also drain directly to the Carpinteria Salt Marsh. These include "Drainage E", which drains about 70 acres into the far western portion of the Carpinteria Marsh, and the Franciscan Channel, which drains about 640 acres north of the US 101 freeway.

Figure 5.3-1

Table 5.3-1 indicates the amount of the study area that is drained by each watershed. The characteristics of these drainages, listed from west to east across the study area, are further described below.

Table 5.3-1 Watershed Areas

Watershed	Acreage Within Study Area	Study Area Portion of Watershed
Toro Canyon Creek	655	25%
Garrapata Creek	325	94%
Arroyo Paredon	842	25%
Drainage "E"	72	100%
Franciscan Channel	532	83%
Santa Monica Creek	364	12%
Franklin Creek	1,143	45%
Carpinteria Marsh	227	100%
Carpinteria Creek	2,148	22%
Coastal drainage	75	13%
Rincon Creek	830	9%

Source: Rincon Consultants, 1999

Toro Canyon Creek's East and West Branch drain sub-watersheds of 869 and 986 acres, respectively, and are capable of producing peak flows of about 1,800 and 1,900 cubic feet per second (cfs) during the 100-year storm event. The 100-year storm event is that which has a 1% statistical probability of occurring in any year based on historical rainfall records. Toro Creek's two branches merge near Toro Canyon Road and Foothill Road, eventually discharging into the Pacific Ocean just east of Loon Point. The entire watershed drains an area of approximately 2,323 acres. The earthen creek channel invert depth ranges from 30 feet in the upper reaches of the creek to approximately six feet near Via Real. Santa Barbara County Flood Control District (SBCFCD) maintains a debris catchment basin on the West Branch near Hidden Valley Lane, a basin just north of Torito Lane off Toro Canyon Road, and the East Branch Basin. The peak discharge south of Highway 101 is approximately 2,500 cfs. About 25% of this drainage's watershed is within the study area.

Garrapata Creek drains a small watershed of about 446 acres, most of which is in the study area. The creek flows within an earthen channel southwest, crosses Toro Canyon Road twice, continues southeast bisecting the Serena Park residential area to the west and agricultural fields to the northeast, and eventually discharges into the ocean near Beach Club Road. In recent years, increased surface runoff attributed to the temporary installation of plastic berry-hoops south of Foothill Road has contributed to local flooding and sedimentation of the creek near Serena Park and Padaro Lane. The peak discharge at the creek outlet is 1,000 cfs.

Arroyo Paredon originates in the foothills of the Santa Ynez Mountains and drains a 2,995-acre watershed. The peak discharge south of Highway 101 during the 100-year event is approximately 3,500 cfs. A SBCFCD debris basin is located in the lower reaches of Oil Canyon and another is on the main branch of Arroyo Paredon. The lower reaches of this creek north of the freeway have substantial greenhouse development adjoining it. The creek discharges to the ocean northwest of Santa Claus Lane. This creek has a natural bottom with native riparian vegetation within the creek invert and top of bank.

An unnamed drainage, herein termed **Drainage "E"** drains about 70 acres into the western portion of the Carpinteria Marsh. All of this drainage is within the study area, with most of it containing urban (the freeway) and agricultural uses. Outside of the marsh, flow in this drainage is within improved channels and culverts.

An unnamed drainage area lies between Arroyo Paredon and Santa Monica Creek. This area is drained via a culvert system herein termed the ***Franciscan Channel***. Run-off within this approximately 640-acre watershed behaves mainly as sheet flow with no one drainage course dominating the watershed. Surface flow is conveyed by six small culvert groups which cross under Via Real, U.S. 101, and the Union Pacific Railroad tracks, eventually entering the Carpinteria Salt Marsh. Approximately half of the watershed is conveyed to a silt basin (Kim's Basin) north of Via Real prior to discharge via culverts under Highway 101. Storm water conveyance is compromised due to the inadequate size of the existing culvert groups, the lower elevations and relatively flat topography adjacent to the Carpinteria Salt Marsh. These factors often result in flooding of Via Real, Cravens Lane, U.S. 101, and the railroad tracks even during minor storms (SBCFCD, 98-ND-15).

Santa Monica Creek drains an approximate 2,400-acre watershed and reaches an elevation of 3,853 feet. Most of this watershed is contained within the Los Padres National Forest, with about 12% in the Study Area. Santa Monica Creek extends about five miles southward from its uppermost point to the Carpinteria Salt Marsh, where it joins Franklin Creek to form the "Main Channel" in the Carpinteria Salt Marsh. A large debris basin made up of two components (a debris catchment component and stilling basin that slows hydrologic energy) is located on this creek approximately 2,500 feet north of Foothill Road. The creek is contained within a concrete rectangular channel from the debris basin south to the Carpinteria Marsh. This creek was formerly intermittent through the study area, but it now contains perennial flows due to irrigation runoff from agricultural and urban land uses. It has been estimated that at least 200 different culverts, storm drains, and outflow pipes discharge to Santa Monica Creek in the improved section south of Foothill Road (Page, 1999). Peak flows within the channel are estimated at 3,400 cfs.

Franklin Creek drains a 2,732-acre watershed and reaches an elevation of 1,746 feet. Five debris basins are located on this creek north of Foothill Road. Two are north of the high school with one basin on each of the following branches: West, Miller, and Rubottom. Franklin Creek extends about four miles southward from the foothills of the Santa Ynez Mountains to the confluence of the tidal portion of the creeks. Flow from the upper reaches are routed into a rectangular concrete channel about 2,000 feet north of Foothill Road. This concrete channel transitions to an earthen channel south of Carpinteria Avenue. Similar to Santa Monica Creek, it has been estimated that 200 culverts, storm drains, and outflows discharge into this creek along its improved section (Page, 1999). Peak flows within the channel are estimated at 3,500 cfs.

Carpinteria Creek drains an approximate 9,650-acre watershed. A major portion of this watershed is drained by Gobernador Creek, which drains into the main branch of Carpinteria Creek just north of Casitas Pass Road (SR 192) west of Lillingston Canyon Road. Two debris basins are located along this creek: one on the Gobernador Branch and one on the main branch. Carpinteria Creek has a natural bottom from its headwaters to the ocean. The creek banks are

improved within the City of Carpinteria as primarily earthen slopes, with riprap and concrete used at major road crossings. Within the study area, the creek flows through primarily natural banks. Peak flow volumes are estimated at 12,000 cfs for the 100-year storm event.

A small portion of the study area occurs within a small watershed of ***coastal drainage*** that lies between the Carpinteria Creek and Rincon Creek watersheds. This area is associated with Mark Hill, the majority of which is within industrial land uses within the City of Carpinteria. This area drains via small creeks and gullies south of the freeway that eventually discharge from the ocean bluffs directly to the ocean.

Rincon Creek forms the eastern boundary of the study area and the county line. Most of the watershed for this drainage lies within Ventura County. A total of 9,344 acres lies within this watershed, with a peak discharge at the Pacific Ocean of 10,320 cfs during the 100-year event according to the Federal Emergency Management Agency (FEMA, June 1992).

b. Existing Flood Prone Areas. The Carpinteria Valley is subject to substantial flood flows during periods of peak rainfall and runoff. Figure 5.3-2 illustrates known flooding areas based on the Federal Emergency Management Agency mapping of flood boundaries. Flow restrictions due to limited sized culverts under the US Highway 101 has lead to the backing up of storm waters north of the freeway at Toro Canyon Creek, Garrapata Creek and Arroyo Paredon. Arroyo Paredon periodically overtops its banks at Foothill Road and flows south through open fields and greenhouses en route towards the Franciscan Channel and the Carpinteria Salt Marsh. Localized flooding also occurs east of Craven's Lane. Flood flows are contained within Santa Monica and Franklin Creeks, but the discharge into the Carpinteria Salt Marsh has resulted in flooding within the City south of the railroad tracks, particularly during high tides. Flood flows along Carpinteria Creek are generally limited to the immediate vicinity of the creek banks, but overflow at the US Highway 101 bridge contributes to flooding of the freeway, which is below the general land elevation in this area. An area of localized flooding also occurs in the open field area southwest of the intersection of Shepard's Mesa Road and Casitas Pass Road, which has resulted in flooding of Casitas Pass Road.

Similar to Carpinteria Creek, Rincon Creek storm flows are mostly contained within its outer bank channels. However, due to insufficient culvert capacity at US Highway 101, channel breakout could potentially occur at the entrance to the culvert during the 100-year storm event (FEMA, June 1992). The breakout flow would likely travel southward in the form of sheetflow along the highway underpass, returning to the channel downstream of the culvert.

During the 1997-1998 El Niño winter season, the County and the City of Carpinteria declared a local state of emergency in response to storm damage (SBCFCD, 1998). The State and Federal governments declared Santa Barbara County a disaster area. Locations within and adjacent to the Study Area most affected were Arroyo Paredon adjacent to Foothill Road (SR 192), which overtopped its banks, and Via Real (near Highway 101) which was flooded by storm waters flowing through the Franciscan Channel watershed. Other areas affected by floodwaters were Garrapata Creek and Upper Toro Canyon (SBCFCD, 1998). Both Santa Monica and Franklin Creeks, designed and constructed in the early 1970's to accommodate the then 100-year storm event, functioned well during the two most recent hydrologically significant rain seasons of 1994-5 and 1997-8 (Weber, 1999). While these channels were adequate during the recent rains, it

Figure 5.3-2 FEMA map

is unknown if the channels still have 100-year capacity because of urban and greenhouse development in the watersheds and changes in the statistical storm event since they were designed and constructed (Weber, 1999).

c. Proposed Flood Control Improvements. Santa Barbara County Flood Control and Water Conservation District has scheduled several improvements in the Carpinteria Valley as part of its Capital Improvement Program (Table 5.3-2). The proposed Franciscan Sediment Basin, Franciscan Culvert Extension, and Cravens Lane Storm Drain improvements are designed to remove sediment ~~improve water quality entering Carpinteria Salt Marsh (through sediment reduction)~~ and help alleviate persistent drainage problems in the vicinity of Cravens Lane and Via Real. A secondary benefit is the improvement of water quality entering the Carpinteria Salt Marsh through the reduction of sediment loads.

Table 5.3-2 Funded Capital Improvement Projects In the Carpinteria Valley Study Area

Project Name	Funding Source	Estimated Completion Date	Scope
Carpinteria Salt Marsh Enhancement Project	Flood Control District, Coastal Conservancy, Natural Resource Conservation Service	~~12/01/2001~~ 6/01/2006	Channel improvements, earth berms, and floodwalls
Cravens Lane Storm Drain	Flood Control District	~~11/01/2001~~ 10/30/2003	Underground storm drain and drop inlets to tie into Franciscan Sediment Basin
Franciscan Culvert Extension	Flood Control District, Caltrans, City of Carpinteria	~~12/01/1999~~ 4/01/2000	Culvert widening and repair under Highway 101
Franciscan Sediment Basin	Flood Control District	~~11/01/2000~~ 10/30/2002	Construction of a sediment basin east of Craven's Lane and north of the Franciscan Village Condominiums to intercept flows and silt from the upper watershed

d. Regulatory Setting. The Santa Barbara County Flood Control and Water Conservation District maintains *Standard Conditions of Project Plan Approval* (Appendix E), which discuss requirements that applicants must adhere to prior to receiving development approval. Item 1 of the Conditions notes that new development shall mitigate for increased runoff by directing drainage to an acceptable watercourse, improving downstream facilities, or by mitigating the increased runoff on-site at the discretion of the Flood Control Engineer. Item 11 of the Conditions of Approval indicates that retention basins are required by the District to reduce peak runoff generated from the developed site. It is further stated that basins may be required in other areas of the County if downstream facilities are determined to be inadequate by the Flood Control Engineer. The retention basin section of the Conditions of Approval (Item 11) contains ten sub-components that guide the standards upon which basins shall be designed. These include hydraulic analysis, volume, outflow device, slopes, emergency overflow, low

flow drainage, access ramp, fencing, landscaping and maintenance. In a new draft, the Flood Control District proposes to amend Item 11 of the standard conditions to require retention basins for all greenhouse development. Cultivated agriculture and orchard production are not regulated; thus, no retention basins are required.

The SBCFCD also operates under the regulatory authority of County Ordinance #3095 (Setback Ordinance), which requires a minimum 50-foot setback from the top of bank of any watercourse, and Ordinance #3898 (Floodplain Management Ordinance), which regulates development in special flood hazard areas as shown on FEMA Flood Insurance Rate Maps.

Encroachment into floodplains, such as artificial fills and structures, reduces the capacity of the floodplain and increases the height of floodwaters upstream of the obstructions (FEMA, 1992). The concept of a floodway is used as a tool to assist in floodplain management. The floodway is that portion of the river channel plus adjacent floodplain areas that must be kept free of obstructions to allow passage of the 100-year storm without increasing the flood height ~~by more than one foot~~, provided that hazardous velocities are not produced. Outside of the floodway is the floodway fringe, that area of the floodplain that can be encroached within without raising the flood height more than one foot. Together, they comprise the floodplain, that area which is inundated during the 100-year storm. These areas are defined on FEMA Flood Insurance Rate Maps (FIRM).

SBCFCD conducts routine maintenance operations within the local creeks under the *Santa Barbara County Flood Control District and Water Conservation District Annual Maintenance Plan.* Maintenance activities are typically designed to remove obstructive vegetation and sediment deposits that could cause flooding, significant erosion, or plugging of downstream culverts and bridges.

In addition, the County's Planning and Development Department also regulates drainage modifications through development review of projects.

5.3.2 Impact Analysis

a. Methodology and Significance Thresholds. A significant flooding impact would result if the proposed project would:

- Substantially alter the course or flow of flood water;
- Require the need for private or public flood control projects;
- Expose people or property to water related hazards such as flooding, by increased density within 100-year flood plains; or
- Substantially accelerate runoff.

b. Project Impacts. The AG-I-OF zone district retains the provisions of the existing AG-I zone district except for greenhouse development of 20,000 sf or more. The conversion of land to open field and orchard agriculture and the construction of less than 20,000 sf of greenhouse development per legal lot are permitted under the existing zone district, as well as the proposed AG-I-OF. As stated in Section 3.0, most land that is suitable for greenhouse cultivation has already been converted to agriculture. Eliminating the *opportunity* to construct greenhouses on

slopes greater than 5% will not create an incentive to bring more natural lands into cultivation, as greenhouse development would not have occurred on these slopes anyway. Furthermore, conversion of natural lands to open field and orchard cultivation could occur irrespective of the proposed project. As discussed in Section 3.0, Environmental Setting, these zone district provisions and the impacts associated with their continuation are a part of the environmental baseline and will continue whether or not the project is approved. Therefore, there are no reasonably foreseeable significant flood and drainage impacts associated with the proposed AG-I-OF zone district.

The project impacts identified below would result from potential buildout of 3.0 million sf of greenhouse development in the proposed AG-I-CARP zone district. Buildout of greenhouse development in the study area has the potential to decrease natural infiltration and subsequent percolation to the groundwater (see also *Section 5.2, Water and Groundwater* for discussion on decreased permeability impacts). The additional 3.0 million square feet of impervious surface has the potential to cause off-site flooding impacts by over burdening the existing drainage channels. The conversion also has the potential to cause localized flooding in the immediate vicinity of the converted parcels. Siting structures in the flood zone may risk damage to the structures. The following discussion reviews these conditions and identifies and describes the potential impacts and mitigation measures.

Impact F&D-1 Buildout of the Project Description has the potential to cause off-site flooding and drainage impacts.

The proposed project would encourage the conversion of three million square feet of existing open field agriculture to greenhouse uses. The result would be an incremental decrease in pervious surface available for groundwater percolation and recharge. The corresponding surface water runoff has the potential to contribute directly to the peak flow that occurs during and immediately after a rain event. If the peak flow exceeds the discharge capacity of the existing drainage channels, flooding will occur. This chain of events could lead to potentially significant risks to people or property.

Under the proposed project, greenhouse expansion would occur in only the four watersheds in the middle of the study area. Table 5.3-3 indicates the estimated potential increase in peak flows due to greenhouse development in these watersheds. The greatest impact could occur in the Franciscan Channel watershed, where an increase in peak flows of about 6% could occur. The largest change in flow would occur in the Franklin Creek channel, where up to 100 cfs (cubic feet per second) could be added to the peak flow. It is important to note that contributions to peak flow (as a percentage of the total) from greenhouse development are much greater at locations near the new development. Thus, the potential for off-site flooding is greatest on downstream properties near the new development. Because of the existing flooding problems and existing conveyance deficiencies, particularly those associated with Arroyo Paredon and the Franciscan Channel, any increase in peak flows would be considered a significant impact.

Table 5.3-3 Increased Peak Flows During 100-Year Storm Event Due To Cumulative Greenhouse Development

Watershed	Greenhouse Acreage	Peak Flow Increase	Percentage Increase
Arroyo Paredon[1]	42	40 cfs	1%
Franciscan Channel[2]	40.5	40 cfs	6%
Santa Monica[2]	41.5	40 cfs	1%
Franklin[2]	103	100 cfs	4%

[1] *Peak flow measured at ocean.*
[2] *Peak flow measured at entrance to Carpinteria Salt Marsh.*

Impact F&D-2 Greenhouse buildout has the potential to cause flooding and erosion impacts on-site and to neighboring properties.

If not properly designed or maintained, the required retention basins have the potential to overflow and flood neighboring properties. Since retention basins are designed to retard the initial storm peak response, they have the potential to fill and overflow during and immediately following a storm. The consequent flooding has the potential to cause surface erosion both on-site and on neighboring properties. The erosion could cause sediment deposition in the channels potentially decreasing channel conveyance capacity, a current cause of flooding along the Franciscan Channel. Additional sedimentation impacts could occur to the Carpinteria Salt Marsh, where sedimentation could smother benthic invertebrates, eggs and juveniles of various aquatic species. Further discussion on potential sedimentation impacts to biological resources in the Marsh is included in *Sections 5.2, Water Quality and Groundwater and 5.8, Biological Resources*.

Impact F&D-3 Construction of greenhouse structures within the 100-year flood plain zone could be susceptible to damage from flooding.

Based upon the County's Flood Plain Management Ordinance (#3898), greenhouses could be constructed at or below the base flood flow level elevation at the discretion of Flood Control. Greenhouses could be designed to allow through flow of floodwaters ~~such that they would not result in an increase in the base flood elevation of more than one foot~~. Utility connections would also need to be protected or elevated to avoid power failures or dangerous conditions in the floodwaters. The siting of greenhouses within the flood zone has the potential to deflect floodwaters into other areas and cause flooding if they are not sited properly.

Locating retention basins within the 100-year flood plain may also be problematic since the basin could not be assured of functioning correctly in periods of heavy rainfall or flooding. ~~The recently approved Mountain Side Flowers project (96-DP-022) was located almost entirely within the 100-year floodplain of Franklin Creek. The County Flood Control District permitted the project to mitigate drainage impacts by capturing upstream flow on a separate, undeveloped parcel.~~ The construction of greenhouses and associated retention basins within the 100-year floodplain could result in potentially significant impacts. This option may not be feasible for all projects due to geographic and other parcel constraints. Flood Control would need to evaluate floodplain-constrained development on a case-by-case basis to determine appropriate mitigation.

5.3.3 Mitigation Measures

a. Existing Comprehensive Plan/Coastal Plan Policies.

Existing County policies are intended to avoid exposing new development to flood hazards, reduce the need for future flood control protective improvements, and avoid alteration of stream and wetland environments. They include the following:

Flood Hazard Area Policy 1/CLUP Policy 3-11

All development except for flood control projects and non-structural agricultural uses shall be prohibited in floodways. Development in the floodplain is permitted if creek setback requirements are met and structures are elevated above the 100-year flood elevation consistent with the County Floodplain Management Ordinance.

Flood Hazard Area Policy 2/CLUP Policy 3-12

Development shall not cause or contribute to flood hazards or result in using public funds for flood control works such as dams, stream channelizations, etc.

Hillside and Watershed Protection Policies/CLUP Policies 3-13 to 3-22

Nine policies intended to guide development on hillsides and within watersheds are specified in the Land Use Element. These policies call for minimizing cut and fill, fitting development to the site topography, soils, geology, hydrology and other natural features, and specifying techniques for minimizing the effects of necessary grading.

b. Proposed Development Standards. The Santa Barbara County Coastal Zoning Ordinance (updated April, 1999) does not contain development standards specific to flooding and drainage. However, the Santa Barbara County Flood Control District has developed specific *Standard Conditions of Project Plan Approval* (refer to Appendix E for complete text). The proposed zoning ordinance change for the AG-I-CARP zone includes the following development standard to reduce flood impacts (F&D-1 and -2).

Mitigation F&D-1. Unless otherwise exempted by the County Flood Control District, all new greenhouse development shall be required to fully mitigate for increased storm water runoff from development of the project site. Where required, retention basins and other storm water drainage facilities shall be designed in conformance with the Flood Control District standards. *(Addresses Impacts F&D-1 and F&D-2)*

Mitigation F&D-2 New greenhouse development shall submit all final building and drainage plans to the Santa Barbara County Flood Control District for review and approval. *(Addresses Impact F&D-1 through 3)*

c. Additional Proposed Mitigation Measures. Proposed modifications to the Flood Control District *Standard Conditions of Project Plan Approval* (see Appendix E) would serve to substantially reduce potential impacts that are associated with project-specific and cumulative greenhouse expansion. Implementation of scheduled flood control improvements (Table 5.3-2) will also help alleviate persistent drainage problems in the vicinity of Cravens Lane and Via Real. Construction of the proposed Franciscan Sediment basin near Cravens Lane will also help

improve water quality by capturing silt and sediment prior to entering Carpinteria Salt Marsh. Additional mitigation measures addressing sedimentation and erosion impacts are found in *Section 5.2 Water Quality and Groundwater*. The following mitigation measures are required to further reduce existing and future flooding problems.

Mitigation F&D-3 New greenhouse development shall be designed such that post-development runoff shall not exceed 75% of the calculated predevelopment runoff for 5-100 year events. *(Addresses Impact F&D-1 and –3).*

The hydrograph is a graphical representation of the rate of runoff (discharge) per unit time that comes out of a watershed or discreet area and is measured as it passes through a particular location (i.e. a channel). This is equivalent to the volume of water that passes a point during any particular time period (i.e., cubic feet per second). The post-development total volume of runoff is typically greater than the pre-development volume because of an increase in impervious surface and subsequent increase in runoff. The retention basins serve to store water for the critical time period during high flows, thereby reducing the peak discharge or runoff. Although the required retention basins are designed to reduce the peak flow from the hydrograph by causing a lag, the increase in volume of flow is typically not mitigated for and would not be affected if the retention basins are set to fully drain at a controlled rate.

~~**Mitigation F&D-4** Prior to construction of the Craven's Lane culvert and the Franciscan Sedimentation Basin, the design calculations for these improvements shall accommodate anticipated greenhouse development within the watershed. *(Addresses Impact F&D-1 and 2)*~~

Mitigation F&D-~~5~~ 4 ~~Temporary~~ Hoop structures constructed within the AG-I-OF zoning district greater 5,000 sq. ft in area shall be subject to Flood Control District review to mitigate potential drainage and erosion impacts. *(Addresses Impact F&D-1 through 3)*

5.3.4 Residual Impacts

The following discussion identifies the level of significance after all available mitigation measures have been applied.

Impact F&D-1. Decreasing the post-development peak flow rate to 75% of pre-development runoff would allow storm flows to be adequately conveyed through the flood control facilities. Impacts would be reduced to ***less than significant levels (Class II).***

Impact F&D-2. Implementation of Flood Control Standard Conditions (including proposed modifications specific to greenhouse development) and the above measures would reduce flooding impacts and consequent risk of damage to neighboring or downstream properties to a ***less than significant level (Class II).***

Impact F&D-3. Submittal of final plans to the Santa Barbara County Flood Control District for review and approval would help minimize potential flooding damage to structures. Impacts would be reduced to ***less than significant levels (Class II).***

5.3.5 Cumulative Impacts.

Cumulative development of projects in the Carpinteria Valley is anticipated to incrementally increase the amount of impervious surface area available for stormwater runoff. The corresponding hydrologic response will likely consist of increased overland runoff to the stormdrains and creeks in the study area. The increase in surface flows have the potential to over burden existing drainages and flood control conveyance facilities, thus increasing risk of flooding, safety, and consequent damage to welfare and property.

The Santa Barbara County Flood Control and Water Conservation District is managing a five-year Capital Improvement Projects (CIP) plan, which functions to support community resources and public facilities. With the combination of mitigation measures included in this report and the planned CIP projects, the project's contribution to cumulative flood hazards would be ***less than significant (Class II).***