

B. HYDROLOGY

This section was prepared by Cleath and Associates, and includes an analysis of hydrologic conditions and hazards on the Fiscalini Ranch Preserve (FRP), including drainage and flooding. Existing conditions were characterized based on available studies, Federal Emergency Management Administration (FEMA) floodplain maps, interviews, and field reconnaissance.

1. REGULATORY SETTING

a. FEDERAL POLICIES AND REGULATIONS

Protection of jurisdictional aquatic resources, including wetlands, is regulated by the U.S. Army Corps of Engineers (ACOE), while FEMA is responsible for identifying flood hazards, coordinating flood plain management and regulating the placement of structures in flood plains. The minimum flood plain management requirements for participation in the National Flood Insurance Program are set forth in the Code of Federal Regulations 44 CFR 60.3.

Water quality protection is regulated by the Federal National Pollutant Discharge Elimination System (NPDES) Program, established by the Clean Water Act. The U.S. Environmental Protection Agency (USEPA) established stormwater permit requirements based on compliance with a NPDES permit. Discharges of stormwater associated with construction activity that results in a disturbance of one acre or more of total land area requires a NPDES General Permit for Discharges of Stormwater Associated with Construction Activity. Permits are required for all stormwater discharges associated with a construction activity where clearing, grading, and excavation occurs. This permit requires developers to implement Best Management Practices (BMPs) to prevent the discharge of sediment-laden water off site. The site-specific plan to implement BMPs is called the Stormwater Pollution Prevention Plan (SWPPP). The plan must include a description of soil stabilization and sediment load control methods that would be implemented to minimize erosion and sediment loading during construction of the project. The SWPPP also includes descriptions of post-construction BMPs. The State of California administers the stormwater permits through the State Water Resources Control Board (SWRCB) and its local Regional Water Quality Control Board (RWQCB) (Central Coast Region).

United States Department of Agriculture Natural Resource Conservation Service (NRCS) recommended erosion control and gully stabilization methods for the West FRP Seaclift Gully. The Management Plan recommends consultation with NRCS to develop an appropriate plan for erosion control and gully stabilization for the West FRP Warren/Trenton Gully.

b. STATE POLICIES AND REGULATIONS

The State Department of Water Resources is responsible for coordinating flood-mitigation activities and is authorized to receive requests from public agencies for assistance during floods. Should flooding occur, these agencies would have policies and regulations with respect to dealing with flooding hazards related to the FRP.

The State of California administers Stormwater Regulations according to the California Water Code Section 13399. SWRCB issues the NPDES General Construction Activity Stormwater Permit. RWQCB monitors the provisions of this general permit.

Bank stabilization projects along Santa Rosa Creek would comply with the California Department of Fish and Game (CDFG) California Salmonid Stream Habitat Restoration Manual (Flosi, 1998). The CDFG requires permit approval and issuance of a Streambed Alteration Agreement.

c. **LOCAL POLICIES AND REGULATIONS**

The *County of San Luis Obispo Safety Element* states the following policy regarding flood hazards: Policy S-7 Flood Hazards: “Strictly enforce flood hazard regulations both current and revised. FEMA regulations and other requirements for the placement of structures in flood plains shall be followed. Maintain standards for development in flood-prone and poorly drained areas.”

The drainage and flood control responsibilities of the County are determined by State and County statutes and by County policy. The responsibilities for drainage are administered through the Road Division of the County Public Works Department and the San Luis Obispo County Flood Control and Water Conservation District. The District is the designated County agency responsible for managing, planning, and maintaining drainage and flood control facilities in unincorporated public areas where no other agency has assumed an active role in such activities.

2. **EXISTING CONDITIONS**

a. **LOCAL CONDITIONS**

Santa Rosa Creek drains a watershed area of approximately 45 square miles, rising from sea level to the crest of the Santa Lucia Mountains at approximately 2,000 feet. Floods downstream in the watershed (including the East FRP and the northeast portion of the West FRP) tend to be high magnitude, but short duration events (Questa Engineering Corp., 2002). FEMA mapped areas of the Santa Rosa Creek floodplain that lie within the 100-year flood boundary (1985, 2004). Most of the East FRP and the northeast corner of the West FRP lie within the boundary. The 100-year flood boundary in the East FRP is shown on Figure V-5.

Drainage patterns on the West FRP include minor drainages and sheet flow, and the eroding Seaclift and Warren/Trenton gullies. On the East FRP, the largest tributary drainage to Santa Rosa Creek is in the southwest corner, and it flows northward along Highway 1, entering the creek immediately upstream of the bridge. A second significant drainage course in the East FRP receives flow from offsite areas near Piney Way.

b. **WEST FRP – SITE CONDITIONS**

The West FRP occupies a gently sloping terrace rising from the coastal bluff top to an elevation of approximately eighty feet, and a higher upland area that reaches elevations of approximately 250 feet. The upland area consists of a nearly flat lying terrace flanked by gentle to moderate slopes descending to the lower terrace to the southwest, west, and northwest. The northeast corner of the West FRP is located within the floodplain of Santa Rosa Creek.

1) West FRP – Drainage

The Seaclift Gully drains a large portion of the central part of the West FRP (refer to Figure V-4). A 36-inch diameter culvert under Windsor Boulevard receives runoff from the gully. The smaller, but steeper Warren/Trenton Gully drains the southeast corner of the site (refer to Figure V-4). In the remaining areas, stormwater runoff generally consists of sheet flow concentrating into minor gullies near the coastal bluff to the west, or to Santa Rosa Creek to the northeast. Springs flowing into the Seaclift Gully and its tributary gully, and the spring in the northeast corner flow all year around with the possible exception of drought years. Within the lower terrace area there are five seasonal wetlands. Several or all of these wetlands have shallow water just below the ground surface during the dry season, but drain as surface flow during winter storm conditions.

2) West FRP – Flooding

Major flooding during significant storm events on the West FRP is limited to the northeast corner of the FRP between Santa Rosa Creek and Highway 1. The Santa Rosa Creek trail is proposed within this area, near an existing buried, sanitary sewer line. Severe streambank erosion had occurred along the west bank in the past, threatening the sewer line. Because of the continued bank erosion, the sewer line was relocated away from the creek, and streambank restoration efforts were conducted. Minor sheet flow flooding occurs during storm events in the wetland area along the southern site boundary between Marlborough Lane and the coastal bluff.

c. EAST FRP – SITE CONDITIONS

The East FRP comprises part of the floodplain of Santa Rosa Creek and the lower portions of steeply sloping hills. The floodplain gently slopes to the west at a gradient of approximately one percent and is incised along the northern edge of the East FRP by Santa Rosa Creek. The uniformly sloping floodplain is interrupted by a broad gully approximately four to six feet deep, located east of Highway 1.

1) East FRP – Drainage

Stormwater runoff from the hills to the south sheet flows across the floodplain in a northwesterly and westerly direction towards the creek, or runoff flows into the wide swale located in the western portion of the East FRP, ultimately flowing into Santa Rosa Creek upstream and adjacent to the Highway 1 bridge. In the vicinity of Piney Way, significant stormwater runoff flows from two small watersheds. The easterly watershed drains through an actively eroding swale southeast of the property and continues to flow onto the FRP near the existing sanitary sewer system. The larger, westerly watershed drains through heavily vegetated hillside. Significant stormwater volume also flows through the small canyon along Highway 1 and into the creek adjacent to the bridge.

Runoff velocities are generally slowed by the thick vegetation of Monterey pines and low brush along the hillsides, and the grasses mantling the floodplain. The slower runoff velocities lessen the possibilities of downstream flooding, allow for greater surface water infiltration, and decrease erosion and sedimentation. Santa Rosa Creek is heavily vegetated with riparian woodlands and scrub except in areas of active streambank erosion. Riprap and bridge abutments channel the creek under Highway 1 on the west end of the East FRP.

2) East FRP – Flooding

The most recent major flood event in Cambria occurred in March 1995, which caused extensive flooding in the West Village, and some inundation of the East FRP. In the *Hydraulic Analysis for West Village*, for the County of San Luis Obispo (Questa Engineering, 2002), high water marks during the 1995 flood event were recorded at several locations near the northwest corner of the East FRP. Flood water levels reached elevations of 35.01 feet along Cambria Drive, and 35.16 feet at the Mid-State Bank parking lot. During this event, flow in Santa Rosa Creek left the channel just upstream of the Highway 1 bridge, and flowed over the northwest corner of the East FRP and inundated the West Village. The model developed by Questa Engineering (2002) predicts that the peak 100-year runoff event is 18,488 cubic feet per second (cfs). of this amount, under existing conditions, a flow of 2,043 cfs is predicted by the model to spill over the stream bank and flow into the northeast corner of the East FRP.

The channel beneath the Highway 1 bridge is not capable of carrying the 100-year flow rate, and was observed to be inadequate to contain flows in the 1995 flood event (Questa Engineering, 2002). The 1995 flood event is considered to be a ninety-year recurrence event with model-estimated peak flows of 17,700 cfs immediately upstream of the Highway 1 bridge.

According to the FEMA Flood Insurance Study, San Luis Obispo County (2004), flood levels in a 100-year flood event would be within approximately one foot of the ground surface in the vicinity of the proposed parking lot and community center (refer to Figure V-5). Flooding during a 500-year flood event would inundate these areas with just under four feet of water. Flood levels during a 100-year event is predicted in the FEMA study to inundate the western-most soccer field nearly two feet depth. Table V-2 shows flood elevations and ground surface elevations at four locations within the East FRP, and also shows predicted discharges at the Highway 1 bridge.

**TABLE V-2
Predicted Flood Parameters in East FRP**

Flood	Community Center & Parking Lot		Row of Eucalyptus trees		Western-most Soccer Field		Community Park Western Boundary		Discharges at Highway 1 Bridge
	Flood Level	Ground Level	Flood Level	Ground Level	Flood Level	Ground Level	Flood Level	Ground Level	
10 year	38.2	49-51	37.0	47	33.7	40	33.0	38-39	9,883 cfs
50 year	46.3		45.0		39.0		38.4		15,606 cfs
100 year	48.2		46.8		41.8		41.0		18,488 cfs
500 year	52.8		51.5		46.0		45.0		--

Notes:

Elevations in feet above sea level (National Geodetic Vertical Datum)

Flood levels are from Flood Insurance Study, San Luis Obispo County (2004)

Ground levels are from the Grading & Drainage Concept (Firma, 2006)

Santa Rosa Creek discharges in cubic feet per second (cfs) by Questa Engineering Corporation (2002)



Explanation

- ① Future Community Center Location
- ② Parking Lot
- ③ Restroom
- ④ Storage/Maintenance Building
- ⑤ Relocated Pump House
- SD Storm Drain Pipe

Base Map: Aerial photograph by AirPhoto USA
 Scale: 1 inch = 400 feet

**100-year Flood Hazard Map
 FIGURE V-5**

Back of V-5

3. THRESHOLDS OF SIGNIFICANCE

The thresholds of a significant drainage or flooding impact are those that could result in the following:

- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site.
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site.
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems to control.
- Place building structures within a 100-year floodplain, as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map.

4. IMPACT ASSESSMENT AND METHODOLOGY

For this report, existing conditions were characterized based on available studies, interviews, and field reconnaissance. Potential project impacts and cumulative impacts were determined based on the proximity of project improvements to sources of drainage and flooding hazards. Mitigation measures are identified along with a plan for implementation of the mitigation measures.

5. WEST FRP – IMPACTS AND MITIGATION MEASURES

a. WEST FRP – DRAINAGE

Proposed improvements within the West FRP would include multi-use trails, gates and stiles, fences, benches, telecommunications facilities, signs, and parking areas. Some trails, gates, stiles, fences, and benches are already in place. The *Public Access and Management Plan* also includes restoration activities including creek bank stabilization, gully stabilization.

As proposed, the construction design for the parking areas, and other improved surface areas on the West FRP will not contribute to concentrated runoff or significantly alter existing drainage patterns that would result in increased erosion, on- or off-site.

The Seacrift Gully drains a large portion of the central part of the West FRP. A 36-inch diameter culvert under Windsor Boulevard receives runoff from the gully. Any reduction in capacity of the culvert from project improvements or construction activities could result in property damage along Windsor Boulevard. Project improvements and gully restoration projects, as proposed in the Management Plan, will minimize negative impacts to the culvert system. Drainage impacts at the West FRP are not considered significant.

HYD Impact 1 Proposed improvements on the West FRP could incrementally affect drainage patterns and flow rates.

HYD/mm-1 During restoration activities within the Seaclift Gully, soil stabilization measures shall be implemented to ensure that sedimentation or debris do not move downstream and reduce the drainage capacity of the 36-inch culvert beneath Windsor Boulevard.

Residual Impact With implementation of mitigation, this impact would be considered *less than significant with mitigation, Class II*.

b. WEST FRP – FLOODING

Individual project improvements consisting of trails, gates and stiles, fences, benches, a telecommunications facility, signs, and parking lots would not substantially increase the rate or amount of surface runoff that would result in flooding on- or off-site. Cumulatively, these projects may incrementally affect drainage patterns and flow rates, on the FRP, or increase the potential for flooding. Two trail systems, the Bluff Trail and the Santa Rosa Creek Trail, are presently located within areas subject to flooding in the northeast and south corners of the site; however, they will not substantially contribute to increased flooding during a significant storm event. Streambank restoration efforts have been completed along the west bank of Santa Rosa Creek to protect the sanitary sewer system, access road, and trail.

HYD Impact 2 Proposed trail improvements, parking areas, boardwalks, gates, benches, and maintenance activities on the West FRP, could incrementally affect drainage patterns and flow rates, or increase the potential for flooding.

Implement GEO/mm-2.

Residual Impact With implementation of mitigation, this impact would be considered *less than significant with mitigation, Class II*.

6. EAST FRP – IMPACTS AND MITIGATION MEASURES

a. EAST FRP – DRAINAGE

The *Grading and Drainage Concept* plan for the proposed Community Park includes the placement fill material within the proposed sports field area to create a suitable slope gradient to facilitate the sheet flow of stormwater off the turf (refer to Figure III-8). Fill would generally average one foot in depth in the crowned center of the fields, tapering to meet existing grade at the edges. At the field edges along the south side of the park, a series of drain inlets would pick up some of the stormwater flow from the fields as well as intercept some of the runoff from the off site watersheds, including the watersheds near Piney Way. The storm drain system would convey water to an outfall west of the park into a large swale where stormwater would flow overland eventually entering Santa Rosa Creek to the west. During construction and grading activities, following the best management practices as outlined in the project Stormwater Pollution Prevention Plan will minimize erosion and sediment loading on- and off-site.

At the field edges along the northern edge of the park, an open native vegetated swale and storm drain would convey stormwater west parallel to the creek to the same outfall point in the swale west of the park. No direct storm drain pipe outfall to the creek is proposed. The drainage concept shows riprap placed at the outfalls to provide energy dissipaters designed to minimize erosion. The parking and sport court areas are proposed to be essentially at existing grade with cut and fill generally at plus or minus one foot. Stormwater runoff from the paved areas would flow to the native vegetated swale described above.

The grading concept does not show grading past the existing top of creek bank. These limitations on grading will result in little or no changes in existing drainage patterns along the stream bank.

The project, as proposed, will not substantially alter the existing drainage pattern of the site in a manner that would result in substantial erosion or siltation on- or off-site; nor will it create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems to control. These impacts are not considered significant.

HYD Impact 3 Proposed improvements on the East FRP, including trails, maintenance, and community park elements could incrementally affect drainage patterns and flow rates.

Implement GEO/mm-2.

HYD/mm-2 Upon application for land use and construction permits from the County of San Luis Obispo, and prior to site disturbance for development of the East FRP, the CCSD or its designee shall submit preliminary grading and drainage plans incorporating the use of bioswales (or a similar method) to facilitate the flow of stormwater towards Santa Rosa Creek. The bioswales (or similar method) shall include best management practices to avoid erosion and scour, and shall include a method for filtering hydrocarbons, sediment and other potential pollutants from stormwater runoff.

Residual Impact With implementation of mitigation, this impact would be considered *less than significant with mitigation, Class II*.

b. EAST FRP – FLOODING

During a 100-year storm event flood levels are anticipated to rise above the Santa Rosa Creek top of bank and sheet flow across the site, as shown in Figure III-8. The restroom structure is proposed to be designed to be a minimum of one foot above the 100-year flood elevation. A storage and maintenance building is proposed to be located immediately adjacent to the 100-year flood boundary (refer to Figure V-5).

HYD Impact 4 Proposed structures on the East FRP, within the proposed Community Park, including a storage and maintenance building would be located within the 100-flood zone, and would potentially obstruct floodwaters.

HYD/mm-3 Upon application for land use and construction permits from the County of San Luis Obispo, and prior to site disturbance, the CCSD or its designee shall submit plans demonstrating that no buildings shall be located within the 100-year flood zone, or that any structures would be located one foot above the 100-year flood zone.

Residual Impact With implementation of mitigation, this impact would be considered *less than significant with mitigation, Class II*.

7. CUMULATIVE IMPACTS

Cumulative effects of the FRP Master Plan with other currently proposed projects in the area relating to drainage and flooding were evaluated. There are few proposed projects pending approval or recently issued land use permits in the vicinity of the project.

The Main Street improvement project includes the removal of the Rod and Reel mobile home park, the addition of housing units near Santa Rosa Creek, and offices along Main Street. The project will include an increase in impervious surface area to the improvement site. Any additional stormwater runoff and changes in drainage systems discharging to the creek from the Main Street project combined with the proposed project are not expected to result in significant cumulative effects relating to flooding along Santa Rosa Creek on the FRP.

The County of San Luis Obispo Public Works Department is developing a plan to construct a bypass structure beneath Highway 1 north of the Highway 1 bridge, approximately 200 feet south of Cambria Drive. The plan is scheduled for commencement in November 2007. The purpose of the bypass is to drain flood waters northeast of the highway and south of Mid-State Bank to lessen flooding potential to the West Village. The floodwaters drained by the structure would be conveyed to the Santa Rosa Creek channel west of the highway. The outfall to the creek channel is not expected to result in streambank erosion.

Based on implementation of the mitigation measures listed above, and the reasonable expectation that future projects would comply with the Uniform Building Code and County Code, cumulative drainage impacts would be *less than significant, Class III*.

LIST OF ABBREVIATED TERMS

Abbreviation	Term
ACOE	Army Corps of Engineers
BMP	Best Management Practices
CDFG	California Department of Fish and Game
CCSD	Cambria Community Services District
EIR	Environmental Impact Report
FEMA	Federal Emergency Management Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
SWPPP	Stormwater Pollution Prevention Plan
USEPA	U.S. Environmental Protection Agency

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