

**Legend**

- 100 Year Flood Elevation
- Levee Crown Elevation
- Interior Elevations
- Delivery Point
- Supply Staging Area
- Water Landing
- Historic Seepage Area
- Historic Levee Breach
- Relief Cut
- Historic Erosion Area
- Historic Slope Stability
- Levee Access
- Emergency Berm
- Dryland Levee
- Levee
- Pump Station - Reclamation District
- Pump Station - Emergency Pump Out
- Structure
- Command Post
- District Boundary
- Waterways / Channels
- Evacuation Route
- Union Pacific Railroad

**FLOOD FIGHT HISTORY**

**1955**  
The Mokelumne River broke through its southern bank upstream of RD 348. Water flowed west and north to the railroad tracks and the small dryland levee north of Pelletier Road that protects Thornton by preventing further northward flow of water. The district laid sandbags on top of the dryland levee and sandbagged the undercrossing of West Kile Road near the west end of the dryland levee where floodwaters could have continued north into Thornton. The district did not flood.

**1986**  
The Mokelumne River peaked at 18.3 feet on February 19<sup>th</sup>, over three feet above flood stage (15.0'). The primary levee failed just north of the New Hope Road bridge on February 20<sup>th</sup> after river elevations had begun to rapidly recede (possibly due to the failure of Tyler Island downstream). Officials surmise there was a saturation failure with portions of levee subsequently seen several feet back from their original location. Flood water filled the areas east of Union Pacific Railroad tracks and eventually broke through tracks near Benson's Ferry at 2 p.m. the same day. Water partially filled the area between the railroad tracks and Interstate 5 flowing westward primarily through the Barber Road underpass. Waters sheet flowed across the district north of Walnut Grove Road which served as a barrier preventing the flow south (Walnut Grove Road is the highest elevation in the area). Water moved into areas south of Walnut Grove Road Marina for the first two days, mainly through culverts in the road. The northwest corner of the district and the area just east of Wimpy's Marina and water did not approach the levee. The third day floodwaters broke over Walnut Grove Road completely inundating the south side of the district. Portions of Thornton remained dry although the entire town was surrounded by water. The relief cut was made on the fourth day at the junction of the Mokelumne River and Beaver Slough by the district, break repaired by the COE. Emergency pumps were installed next to the district pump station on Mokelumne River south of Walnut Grove Road.

**1997**  
Record flows on the Cosumnes River with high flows on the Mokelumne River (5,000 cfs) led to peak stage of 21.7 at Benson's Ferry gauge on January 3<sup>rd</sup>. The district levees had no floodboard remaining from Union Pacific railroad tracks to the junction of the Mokelumne River and Beaver Slough. A critical situation created by flood waters breaking back into the Mokelumne River from the flooded Bean Ranch across from the district's west side levee. A rodent hole opened up with water at the levee crown, the district was just able to save the levee. Emergency sandbagging at low spots prevented overtopping. The area was evacuated even though the levees held.

**SPECIAL FLOOD CONSIDERATION**

**GENERAL**  
Following the 1986 flood, railroad raised track embankment by 2' and strengthened embankment with additional rock. In the event of a levee failure East of RR track the location where ponding floodwaters will break through embankment is uncertain and will probably not correspond to previous location where embankment failed. Strengthened and heightened embankment will hold longer allowing floodwaters to pond to a greater depth so that breakthrough when it comes will be more destructive. Possibility exists of significant flow through Thornton if embankment fails at that location south of town.  
Maximum permissible flows on the Mokelumne River below Camanche Dam is 5,000 cubic feet per second. Most reasonable spill scenarios would peak at around 10,000 cubic feet per second. District officials feel that flows much above 5,000 second feet combined with probable significant flows on Cosumnes River would overtop southeast sections of primary district levees.

**BEAN RANCH**  
Eastern levee of Bean Ranch normally fails at 18' elevation leading to rapid filling of this area. When the Bean Ranch fills, flood water then breaks back into the Mokelumne River at its south end pushing water to the top of RD 348 western levee. The exact location where it will break back in is uncertain so the stretch of levee indicated on map is at risk of high flows directly at levee. In 1997 water broke back into channel in this manner and pushed water to the levee crown. Crews were on site to sandbag low spots to prevent overtopping. These high water levels opened up a rodent hole (shown on map), district officials only just managed to prevent levee failure.

**BEAN RANCH EAST LEVEE**  
Since 1997 owners of the Bean Ranch have widened their eastern levee although elevation remains the same. The levee will not fail as quickly but will suffer extended overtopping before levee failure. This delay could allow floodwaters to back up more than in the past prior to catastrophic failure of the levee creating a stronger flow through the Bean Ranch and back to the Mokelumne River channel against RD 348 levees.

**WATER FLOW - BARBER ROAD UNDERPASS**  
Main water flow through Barber Road underpass where concrete sides washed out from high flows. Water sheet flowed over area north of Walnut Grove Road which is the high point of the district and divides it in two. Water flowed through culverts in Walnut Grove Road, but the road served to hold back water until the third day break at which point water broke over the road and flooded the southern part of the district to much greater depths.

**WATER FLOW - RAILROAD EMBANKMENT**  
Water flow under the railroad embankment through a large culvert eventually washed out the culvert and a large hole developed in the embankment structure. This initial failure rapidly reduced water levels east of the railroad embankment and began flooding the area between the railroad and Interstate 5. The washout occurred some 6 hours after the failure of the primary levee at around 2 p.m.

**1986 LEVEE BREACH AND REPAIR**  
The levee failed around 6:55 a.m. on February 22, 1986, less than an hour after passage of a levee patrol. This area was, and historically has been, an area of heavy seepage. A section of levee was observed some 300-400 yards from the levee still holding a small tree upright. This confirms the belief that the sand levee was superaturated from a long period of high water levels and subsequently lost its ability to hold even though water levels had receded approximately one and one-half feet from highs prior to the break.  
Water moving through the break stabilized and receded fairly rapidly. A dredger moving to repair the break had to trench the channel to be able to move into position.

**THORNTON HIGH GROUND**  
The Town of Thornton is situated on high ground. Parts of the town remained dry in 1986 with water levels of 18' (NGVD 29).

**BEAVER SLOUGH RELIEF CUT**  
Made relief cut on 4<sup>th</sup> day after break once water built up above water elevations inside the Mokelumne River. Cut made by dredger and repaired with dredger. Used dirt to repair with rocks placed to anchor the ends. Should not be a problem to cut again if necessary.

**FLOOD CONTINGENCY OPTIONS**

**HIGHWATER EVENT**  
The general flood fight strategy will be to maintain primary district levees and perform pre-planning for a relief cut or defense of Hartog Dryland Levee.

**Actions Needed**

- Initiate and coordinate patrol of primary levees and respond to identified problems.
- Participate in North Delta Unified Flood Fight Command with command post at Van Esel Dairy in Brack Tract.
- Identify and ensure availability of equipment needed to make relief cut.
- If a spill at Camanche Dam is possible, position flood fight material at Hartog Dryland Levee and begin clearing brush through RR trestle.

**UPSTREAM BREAK ON MOKELUMNE RIVER**  
The general flood fight strategy will be to hold Hartog Dryland Levee to prevent flooding of district and facilitate movement of floodwaters through RR trestle into Beaver Slough.

**Actions Needed**

- Raise Hartog Dryland Levee, sandbag West Kile Road underpass at west end of levee, and place wave and seepage protection plastic on front face of levee.
- Clear brush and debris from Union Pacific RR trestle at west end of Hartog Dryland Levee to facilitate flow of flood waters through trestle and into Beaver Slough.
- Confirm location of relief cut if needed and identify and position equipment to make cut.

**FAILURE OF PRIMARY LEVEES EAST OF INTERSTATE 5**  
The general flood fight strategy will be to make a relief cut and monitor RR embankment as noted below to minimize damage to Thornton.

**Actions Needed**

- Make relief cut (approximate STA 238+00 on map) when flood water depth exceeds surface elevation of Mokelumne River.
- If break is on primary levee between Interstate 5 and Union Pacific tracks, monitor and patrol RR embankment to prevent embankment failure with flooding of eastern side.
- If break is east of RR tracks, monitor RR embankment as waters pond to prevent breakthrough directly into Town of Thornton with resulting high velocity water flow damage.
- Repair levee break.
- Identify lowest accessible point in flooded area for emergency pumping station. Install additional pumps at emergency pumping location for dewatering of district.
- Place visquine on inside of primary levees where erosion from impounded waters is possible.

**FAILURE OF PRIMARY LEVEE WEST OF INTERSTATE 5**  
The general flood fight strategy will be to make the relief cut and monitor backup of floodwaters to Interstate 5.

**Actions Needed**

- Make Relief Cut (approximate STA 238+00 on map) when flood water depth exceeds surface elevation of Mokelumne River.
- Monitor Interstate 5 for signs that floodwaters could back up into Thornton (Unlikely).
- Repair Levee Break.
- Identify lowest accessible point in flooded area for emergency pumping station. Install additional pumps at emergency pumping location for dewatering of district.
- Place visquine on inside of primary levees where erosion from impounded waters is possible.

**EVACUATION PLAN**  
About 1,200 people live in the Town of Thornton or in dwellings scattered throughout New Hope Tract. The elevation of the Town of Thornton is about 10 feet above sea level. The western part of the tract is only slightly below sea level. Interstate Highway 5 traverses the eastern part of the tract and several county maintained roads provide many alternative evacuation routes to high ground in the vicinity of Lodi or Galt.  
All livestock shall be either herded off the tract or moved to high ground by truck. Livestock will not be allowed on the levee.  
All mobile or farm equipment shall be moved to high ground located at wide areas along the levee. All equipment parked on the wide levee areas will not block through traffic along the levee.

**COMMUNICATIONS PLAN**  
The District does not own communications equipment. All communications between district staff, levee patrols, outside jurisdictions and agencies will be personal cellular phones. Phone numbers will be exchanged at the command post upon activation of the plan.

**DEWATERING PLAN**  
The district pump station at the end of Lamb Road is the lowest point on the tract. During a flood the district pump station is under water and cannot be used. Portable pumps are set up on top of the levee at this location and pump floodwater into the Mokelumne River.

**SUPPLY DELIVERY POINT AND STAGING AREA**  
Stokes Farming Shed at 12487 W. Walnut Grove Road, just west of Vail Road on the north side of Walnut Grove Road.

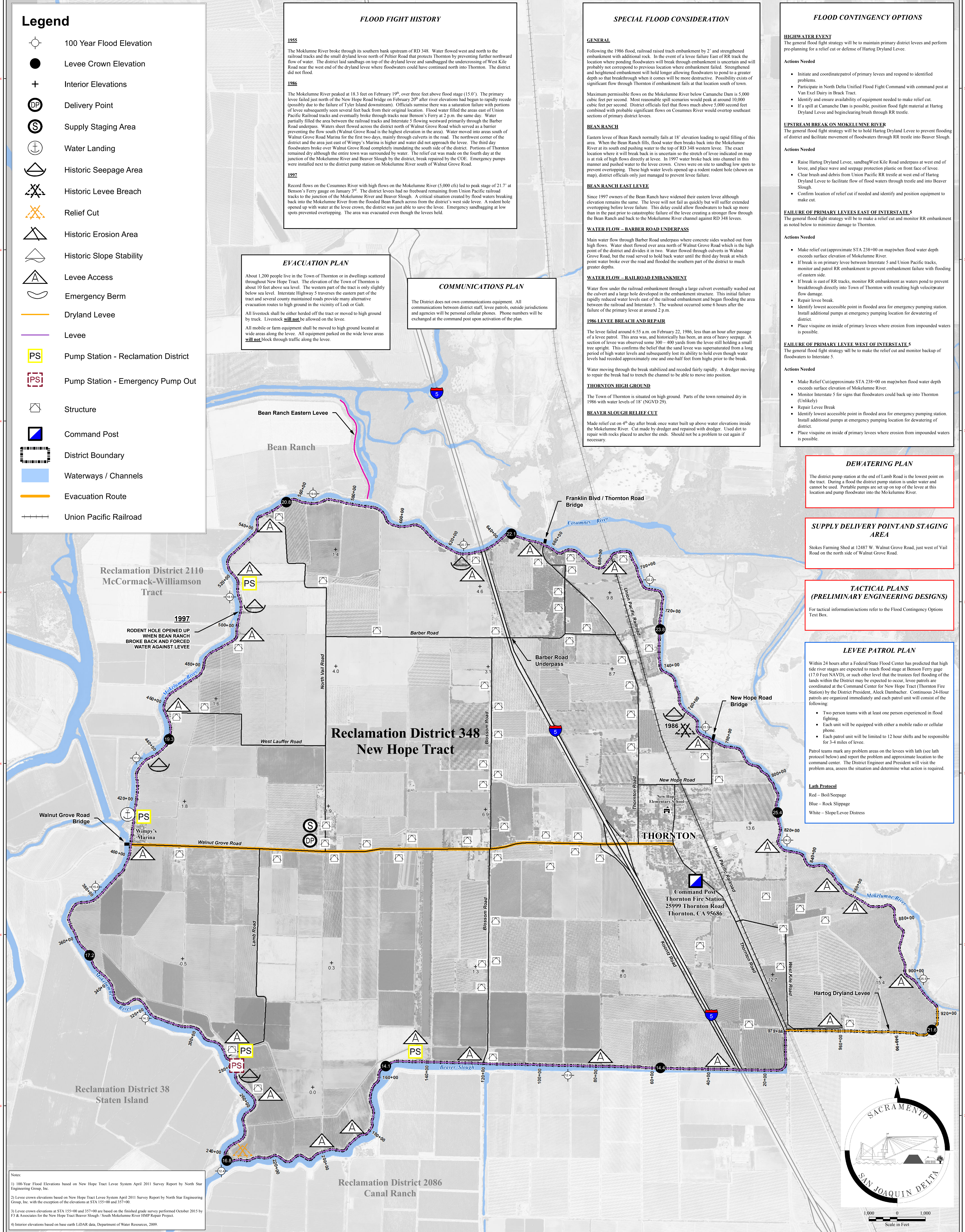
**TACTICAL PLANS (PRELIMINARY ENGINEERING DESIGNS)**  
For tactical information actions refer to the Flood Contingency Options Text Box.

**LEVEE PATROL PLAN**  
Within 24 hours after a Federal/State Flood Center has predicted that high tide river stages are expected to reach flood stage at Benson Ferry gauge (17.0 Feet NAVD), or such other level that the trustees feel flooding of the lands within the District may be expected to occur, levee patrols are coordinated at the Command Center for New Hope Tract (Thornton Fire Station) by the District President, Aleck Dambacher. Continuous 24-Hour patrols are organized immediately and each patrol unit will consist of the following:

- Two person teams with at least one person experienced in flood fighting.
- Each unit will be equipped with either a mobile radio or cellular phone.
- Each patrol unit will be limited to 12 hour shifts and be responsible for 3-4 miles of levee.

Patrol teams mark any problem areas on the levees with lat (see lat protocol below) and report the problem and approximate location to the command center. The District Engineer and President will visit the problem area, assess the situation and determine what action is required.

**Lat Protocol**  
Red - Boll/Seepage  
Blue - Rock Slippage  
White - Slope/Levee Distress



Notes  
1) 100-Year Flood Elevations based on New Hope Tract Levee System April 2011 Survey Report by North Star Engineering Group, Inc.  
2) Levee crown elevations based on New Hope Tract Levee System April 2011 Survey Report by North Star Engineering Group, Inc. with the exception of the elevations at STA 155+00 and 357+00.  
3) Levee crown elevations at STA 155+00 and 357+00 are based on the finished grade survey performed October 2015 by F3 & Associates for the New Hope Tract Beaver Slough / South Mokelumne River IIMP Repair Project.  
4) Interior elevations based on base earth LIDAR data, Department of Water Resources, 2009.

