4.6 HYDROLOGY AND WATER QUALITY

4.6.1 INTRODUCTION

This section describes the existing hydrologic setting for the project site: runoff, storm drainage, and flood control. This section describes regulations and policies affecting local hydrology and water quality, identifies impacts that may result from project implementation, and recommends mitigation measures to reduce potential impacts where appropriate. Impacts associated with water supply (surface water and groundwater) are discussed in Section 4.13, "Water Supply." Impacts associated with exposure of construction workers to contaminated groundwater are addressed in Section 4.10, "Hazards and Hazardous Materials."

4.6.2 ENVIRONMENTAL SETTING

REGIONAL SETTING

The Northern California Youth Correctional Center (NCYCC) facility is located in the North Valley Floor hydrologic unit, within the San Joaquin Basin watershed. The project site is surrounded by agricultural fields to the north and east and existing NYCCC facilities to the northeast, south, and west. The project site is essentially flat with a surface elevation of 35–40 feet. The topography generally slopes from east to west toward the San Joaquin River and the Sacramento–San Joaquin Delta (Delta) (Fugro 2007:1).

The climate in the project area is typical of the San Joaquin Valley "inland Mediterranean" climate characterized by warm, dry summers and cooler winters. Summer high temperatures often exceed 100 degrees Fahrenheit (ºF), averaging from the low 90s in the northern part of the valley to the high 90s in the south. Daily summer temperatures can vary by as much as 30ºF. Winters are mostly mild and humid. Average monthly temperatures during the winter are approximately 50ºF, while the average daily low temperature is about 40ºF (WRCC 2008). The Stockton area has an average of more than 260 sunny days a year (SJVAPCD 2007), with annual precipitation averaging approximately 14 inches (WRCC 2008).

There are no known natural drainages on the project site. The closest natural drainage is the North Fork South Littlejohns Creek (Littlejohns Creek), located approximately 1 mile south of the project site, and Weber Slough, an intermittent drainage channel, approximately three-quarters of a mile to the north (Exhibit 4.6-1). Littlejohns Creek is a modified natural channel that conveys intermittent base flow and storm runoff from its upstream drainage areas, which includes both foothill and lowland agricultural areas (SWAMP 2008). Littlejohns Creek flows into French Camp Slough to the west, which in turn flows into the San Joaquin River approximately 7 miles from the NCYCC facility.

The project area is not within the Federal Emergency Management Agency (FEMA)–designated 100-year flood zone, as determined by Flood Insurance Rate Map Panels 060299 0465C and 060299 0470B, both dated April 2, 2002, which indicate that the project site and the off-site components of the proposed drainage system are located within Zone C, which is defined as "areas of minimal flooding." The 100-year flood zone nearest the project site is immediately north of Arch Road. Areas west of the NCYCC facility along State Route (SR) 99 are also in the 100-year flood zone.

EXISTING DRAINAGE FACILITIES

Most of the NCYCC site, including the project site, drains to the south and, during major storm events, may eventually be pumped into the watershed of Littlejohns Creek. The NCYCC's main existing drainage system includes a trunk line that collects runoff from the northernmost facility at the NCYCC (the Richard A. McGee Correctional Training Center Annex [CTCA]) in a 30-inch storm drain that increases to 36 inches with the inflow from the O. H. Close Youth Correctional Facility and to 42 inches with the inflow from the Karl Holton Youth Correctional Facility. This trunk line then flows into a sump at Stormwater Pump Station No. 1 near the center of the NCYCC campus. (see Exhibit 4.6-1).

Four stormwater pumps discharge into a concrete-lined channel that conveys the flow south and southeast to a 9.0-acre detention basin adjacent to Littlejohns Creek. Connections are available for a fifth stormwater pump if needed in the future. The discharge capacity of each of the three stormwater pumps is 7,500 gallons per minute (gpm), and the capacity of the smaller pump is 2,700 gpm (CPR 2008:32).

An unlined drainage channel, under the jurisdiction of the San Joaquin County Flood Control District, runs through the project area just north of the O. H. Close and Karl Holton Youth Correctional Facilities. Under the proposed project this channel would be rerouted (see Exhibit 4.6-2). This channel collects runoff from the agricultural areas east of Austin Road and conveys it through the NCYCC site. None of the developed areas within the NCYCC facility drain into this channel.

SURFACE-WATER QUALITY

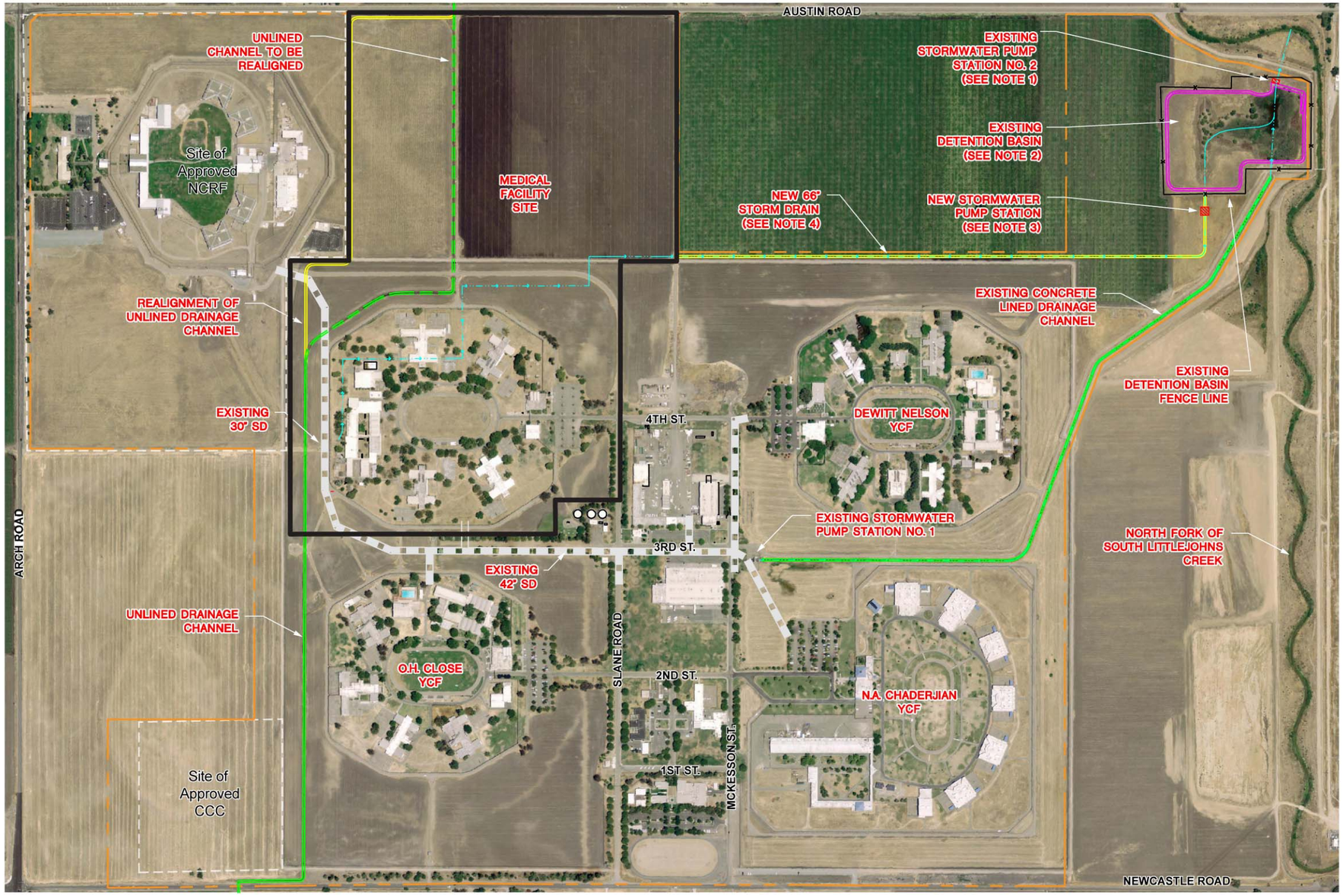
Neither South Littlejohns Creek nor Weber Slough provides a supply of potable water, and no known ongoing water quality monitoring data are available for these water bodies. General observations of water quality have included periodic high turbidity and discoloration during runoff events. Low or no summer flows would suggest seasonally high water temperatures and low levels of dissolved oxygen (DO). These drainages are affected by agricultural runoff and therefore are subject to some contamination by pesticides and salts. Data from the 1980s indicate that biochemical oxygen demand (BOD) concentrations, often associated with low DO levels, frequently exceeded 30 milligrams per liter (mg/l) in Littlejohns Creek, and these exceedances were the result of agricultural runoff (CALFED 2000:2-1). (DO is a critical water quality constituent for aquatic organisms. Although DO levels in receiving water can be highly variable because of seasonal environmental factors and are subject to large diurnal fluctuations, persistent low DO concentrations can result in mortality to benthic organisms and other less-mobile aquatic species. Oxygen-demanding substances, such as ammonia and other nutrients, are measured in the BOD test.)

GROUNDWATER

Important water-bearing formations in the Eastern San Joaquin Subbasin are the Alluvium and Modesto/Riverbank Formations, Flood Basin Deposits, Laguna Formation, and Mehrten Formation (DWR 2006:1). The project site has been mapped as being immediately underlain by Quaternary (Pleistocene age) alluvium of the Modesto Formation. Quaternary alluvium is estimated to be several hundred feet thick in this area and comprise Arkosic alluvium of gravel, sand, and silt. Older alluvium and other continental deposits are estimated to extend to depths of more than 2,500 feet below the surface. Tertiary-age sedimentary rock is estimated to extend to more than 10,000 feet below the surface (Fugro 2007:4–5). Locally, clay, silt, and sand lenses are present throughout the area. A 30-foot-thick clay layer between the first and second water-bearing zones is encountered at a depth of approximately 120 feet. The clay layer appears to act as a barrier to vertical migration between the first and second water-bearing zones. The lower confined aquifer consists of the Mehrten Formation. Because of the saline nature of the groundwater beneath the Mehrten Formation, the base of the usable groundwater basin is considered to be the bottom of the Mehrten Formation (CDC 1995:72).

Groundwater in the project vicinity generally occurs at depths of approximately 60–80 feet below ground surface (bgs). Perched groundwater (i.e., groundwater, usually in limited areas, maintained above the main aquifer by a relatively impervious stratum) may exist above these depths, particularly during the rainy season and in flood-prone areas. Groundwater at four monitoring wells on the NCYCC site was found between 66 and 70 feet bgs. Perched water was not encountered (Fugro 2007:8).

Site of the Proposed Project and Local Hydrology **Exhibit 4.6-1**



LEGEND

- STORMWATER DRAINAGE PATH
- STORM DRAIN
- TITLE REPORT PARCEL BOUNDARY
- POTENTIAL MEDICAL FACILITY SITE

NOTES

1. EXISTING STORM DRAIN PUMP STATION 2 WILL NOT BE ALTERED, AND THEREFORE THE MAXIMUM DISCHARGE RATE TO THE CREEK WILL REMAIN UNCHANGED.
2. EXISTING DETENTION BASIN TO BE SURVEYED AND ITS STORAGE CAPACITY VERIFIED. MINOR IMPROVEMENTS WITHIN THE EXISTING FENCE LINE MAY BE REQUIRED TO ATTAIN THE REQUIRED STORAGE.
3. NEW STORMWATER PUMP STATION – ESTIMATED FOOTPRINT 2,500 SQUARE FEET, PEAK PUMPING RATE AT 100 CUBIC FEET PER SECOND.
4. PROPERTY LINE TO THE NORTH OF PROPOSED ALIGNMENT TO BE SURVEYED TO VERIFY ADEQUATE SPACE TO LOCATE NEW 66" STORM DRAIN OUTSIDE OF EXISTING NCYCC FENCE LINE.

0 350 700
FEET
NORTH

G 08110134.01 015

Stormwater Utilities **Exhibit 4.6-2**

GROUNDWATER QUALITY

Treated groundwater from the NCYCC property is used for potable and operational use and for irrigation. Groundwater from four wells located on the NCYCC property is treated with sodium hypochlorite and stored in three 250,000-gallon aboveground tanks. From the tanks, the treated water is distributed to the NCYCC facility and the CTCA to the north. The wells are tested quarterly for water quality; the well water meets all federal and state standards, with the exception of Well No. 3, which currently operates on standby because of water quality issues (CDCR 2007:12). Contaminants that have been detected are shown in Table 4.6-1. All but tetrachloroethylene (PCE) were below maximum contaminant levels (MCLs).

Table 4.6-1
Well-Water Quality at the Northern California Youth Correctional Center

Parameter	Well Number			MCL
	No. 1	No. 2	No. 4	
Nitrate (as NO_3), mg/l	26	27	25	45
Tetrachloroethylene, µg/l	See text below			5
Trichloroethylene, µg/l	ND	0.62	ND	5
Freon 12, µg/l	1.0	2.0	ND	None

Notes:
MCL = maximum contaminant level, from primary maximum contaminant level, as set by the California Department of Public Health, Title 22 of the California Code of Regulations; µg/l = micrograms per liter; mg/l = milligrams per liter; ND = below detection limit; NO_3 = nitrate
Source: CDCR 2007

PCE was found in concentrations above the MCL of 5.0 micrograms per liter (µg/l) in two samples collected on March 26, 2007, from an indoor faucet at the NCYCC facility. The PCE concentrations were 7.0 µg/l and 7.2 µg/l, respectively. The PCE is believed to have migrated from the Austin Road Landfill, located directly south of the NCYCC. As directed in a resulting citation (Citation Number 03-10-07C-004) by the California Department of Public Health (CDPH) (formerly California Department of Health Services), the CDPH Division of Drinking Water and Environmental Management directed the NCYCC to sample all wells and sample from the same indoor faucet where the PCE concentration exceedance had been found. Samples were collected from three of the wells and the indoor faucet on April 12, 2007. The PCE concentration from the indoor faucet sample was 8.3 micrograms per liter (µg/l). Well No. 2 had a PCE concentration of 8.8 µg/l. Well No. 4 had a nondetection of PCE (the reporting limit was 5.0 µg/l), and the standby well, Well No. 3, had a PCE concentration of 1.6 µg/l.

The water quality in the underlying aquifer has changed over the years, resulting in higher levels of total dissolved solids (TDS) and hardness. Because of these changes in the aquifer's water quality and the potential chemical contamination from the Austin Road Landfill, the proposed project would use City of Stockton (City) water, a mixture of groundwater and surface water, as the sole water supply source (see Section 4.13, "Water Supply").

4.6.3 REGULATORY CONSIDERATIONS

Numerous federal, state, and regional laws, regulations, and policies define the framework for regulating water quality in relation to the proposed project. Water quality in California is regulated through the federal Clean Water Act (CWA), which is managed by the U.S. Environmental Protection Agency (EPA), with implementation delegated to the State Water Resources Control Board (SWRCB) and nine regional water quality control boards (RWQCBs). Water quality at the project site is regulated primarily by the Central Valley RWQCB. The following subsections describe the water quality requirements applicable to the proposed project. Flood protection guidance

is provided by FEMA and is implemented at the state and local levels through legislation and local flood protection ordinances. State regulations related to demonstrating adequate water supply for future water demands resulting from implementation of the proposed project are addressed in Section 4.13, "Water Supply."

FEDERAL PLANS, POLICIES, REGULATIONS, AND LAWS

Clean Water Act

The CWA consists of the federal Water Pollution Control Act of 1972 and subsequent amendments (33 USC 1367), and establishes the basic structure for regulation of discharges of pollutants to surface waters in the United States. EPA is the federal agency with primary authority for implementing regulations adopted under the CWA, which authorizes EPA to set effluent limits for discharges and requires it to set water quality standards for contaminants in surface waters.

The CWA established a framework for regulating municipal and industrial stormwater discharges under the National Pollutant Discharge Elimination System (NPDES) program. The CWA requires dischargers to obtain a permit that establishes effluent limits and specifies monitoring and reporting requirements. EPA has delegated to the State of California the authority to implement and oversee most of the programs authorized or adopted for CWA compliance through the state's Porter-Cologne Water Quality Control Act of 1969 (Porter-Cologne Act), described below.

Safe Drinking Water Act

Under the Safe Drinking Water Act (Public Law 93-523), passed in 1974, EPA regulates contaminants of concern to the domestic water supply. Contaminants of concern relevant to the domestic water supply are defined as those that pose a public health threat or that alter the aesthetic acceptability of the water. These types of contaminants are regulated by EPA's primary and secondary MCLs, which are applicable to treated water supplies delivered to the distribution system. MCLs and the process for setting these standards are reviewed triennially. Amendments to the Safe Drinking Water Act enacted in 1986 established an accelerated schedule for setting MCLs for drinking water.

EPA has delegated to CDPH (formerly the California Department of Health Services) the responsibility for administering California's drinking-water program. CDPH is accountable to EPA for implementing the program and for adopting standards and regulations that are at least as stringent as those developed by EPA. The applicable state primary and secondary MCLs are set forth in Title 22, Division 4, Chapter 15, Article 4 of the California Code of Regulations.

Federal Emergency Management Agency

In 1968, Congress created the National Flood Insurance Program (NFIP) in response to the rising cost of taxpayer-funded disaster relief for flood victims and the increasing amount of damage caused by floods. FEMA administers the NFIP to provide subsidized flood insurance to communities that comply with FEMA regulations to limit development in floodplains. FEMA also issues Flood Insurance Rate Maps that identify which land areas are subject to flooding. These maps provide flood information and identify flood hazard zones in the community. FEMA has established the 1-in-100 annual exceedance probability (i.e., 100-year flood event) as a minimum level of flood protection for new development.

STATE PLANS, POLICIES, REGULATIONS, AND LAWS

Porter-Cologne Water Quality Control Act of 1969

The Porter-Cologne Act is California's statutory authority for the protection of water quality. Under the act, the state must adopt water quality policies, plans, and objectives that protect the state's waters for the use and enjoyment of the people. The act sets forth the obligations of the SWRCB and nine RWQCBs to adopt and periodically update water quality control plans (basin plans). Basin plans are the regional water quality control plans required by both the CWA and Porter-Cologne Act in which beneficial uses, water quality objectives, and implementation programs are established for each of the nine regions in California. The act also requires waste dischargers to notify the RWQCBs of their activities through the filing of reports of waste discharge (RWDs) and authorizes the SWRCB and RWQCBs to issue and enforce waste discharge requirements (WDRs), NPDES permits, Section 401 water quality certifications, or other approvals. The RWQCBs also are authorized to issue waivers to RWDs and WDRs for broad categories of "low-threat" discharge activities that have minimal potential for adverse water quality effects when implemented according to prescribed terms and conditions.

NPDES Permit System and Waste Discharge Requirements for Construction

The SWRCB and Central Valley RWQCB have adopted specific NPDES permits for a variety of activities that have the potential to discharge wastes to waters of the state. The SWRCB's statewide stormwater general permit for construction activity (Order 99-08-DWQ, as amended) applies to all land-disturbing construction activities that would disturb more than 1 acre. Discharges subject to the permit are subject to development and implementation of a storm water pollution prevention plan (SWPPP). The SWPPP includes a site map and description of construction activities and identifies the best management practices (BMPs) that will be employed to prevent soil erosion and discharge of other construction-related pollutants (e.g., petroleum products, solvents, paints, cement) that could contaminate nearby water resources. A monitoring program is generally required to ensure that BMPs are implemented according to the SWPPP and are effective at controlling discharges of stormwater-related pollutants.

Construction activities subject to the general construction activity permit include clearing, grading, stockpiling, and excavation. Dischargers are required to eliminate or reduce nonstormwater discharges to storm sewer systems and other waters. The permit also requires dischargers to consider the use of permanent postconstruction BMPs that will remain in service to protect water quality throughout the life of the project. All NPDES permits also have inspection, monitoring, and reporting requirements. In response to a court decision, the Central Valley RWQCB also implemented mandatory water quality sampling requirements in Resolution 2001-046 for visible and nonvisible contaminants in discharges from construction activities.

The Central Valley RWQCB's general NPDES permit for construction dewatering activity (Order 5-00-175) authorizes direct discharges to surface waters up to 250,000 gallons per day for no more than a 4-month period each year. All of the NPDES permits involve similar processes, including submitting to the Central Valley RWQCB notices of intent to discharge and implementing SWPPPs that include BMPs to minimize those discharges.

Water Quality Control Plan for the Sacramento–San Joaquin River Basins

The basin plan adopted by the Central Valley RWQCB in 1998 identifies the beneficial uses of water bodies and provides water quality objectives and standards for surface waters and groundwater of the Sacramento River and San Joaquin River basins, including the Delta. Federal and state laws mandate the protection of designated "beneficial uses" of water bodies. State law defines beneficial uses as "domestic; municipal; agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves" (California Water Code, Section

13050[f]). Additional protected beneficial uses of the San Joaquin River and its tributaries include groundwater recharge and freshwater replenishment.

Senate Bill 5: 200-Year Flood Protection

Senate Bill (SB) 5 (Chapter 364, Statutes of 2007), signed into law on October 10, 2007, enacts the Central Valley Flood Protection Act of 2008. SB 5 requires the California Department of Water Resources (DWR) and the Central Valley Flood Protection Board (previously known as the State of California Reclamation Board) to accomplish all of the following tasks:

- Prepare and adopt a Central Valley Flood Protection Plan by 2012.
- Establish 200-year protection as the minimum urban level of flood protection, effective with respect to specific development projects as of 2015 or 2025. DWR to produce preliminary maps for 100-year and 200-year floodplains protected by project levees and make them available to cities and counties in the Sacramento and San Joaquin Valleys.
- Set deadlines for Central Valley cities and counties to amend their general plans and their zoning ordinances to conform to the plan within 24 months and 36 months, respectively, of plan adoption (i.e., by approximately 2014 and 2015).
- Obligate Central Valley counties to develop flood emergency plans within 24 months of plan adoption.
- Propose amendments to the California Building Standards Code by 2009 to reduce the risk of flood damage and increase safety in areas where flood depths for the 200-year flood event are anticipated to exceed 3 feet.

Beginning in 2015—potentially sooner depending on when the Central Valley Flood Protection Plan takes effect—local governments will be prohibited from entering into any development agreement or approving any entitlement or permit resulting in construction of a new residence in a flood zone unless they can meet one of three conditions:

- Flood management facilities provide the level of protection necessary to withstand a 200-year flood event.
- The development agreement or other entitlement includes conditions that provide protections necessary to withstand a 200-year flood event.
- The local flood management agency has made adequate progress on constructing a flood protection system that will result in sufficient protections to withstand a 200-year flood event by 2025.

LOCAL PLANS, POLICIES, REGULATIONS, AND ORDINANCES

San Joaquin County General Plan 2010

The following goal, objectives, and policies in the *San Joaquin County General Plan 2010* relating to hydrology and water quality are applicable to the proposed project.

Public Health and Safety—Flood Hazards

- **Goal 1:** To protect people and property from flood hazards.
    - **Policy 6:** Levees in areas planned for urban development shall provide 100-year flood protection, and levees in areas not planned for urban development shall provide 50-year flood protection.

- **Policy 7:** Flood control levees should be designed to conserve resources, incorporate and preserve scenic values, and shall incorporate opportunities for recreation, where appropriate.

- **Policy 8:** Flood management programs should avoid alteration of waterways and their adjacent areas, whenever possible.

Water Resources and Quality

- **Policy 14:** The County [San Joaquin County] shall encourage the development of artificial recharge projects of all scales within the County and cities to increase recharge to the aquifers.

Resources—Water Resources and Quality

- **Objective 1:** To ensure adequate quantity and quality of water resources for municipal and industrial uses, agriculture, recreation, and fish and wildlife.

- **Objective 4:** To protect and eliminate contamination of surface water and groundwater supplies.

  - **Policy 1:** Water quality shall meet the standards necessary for the uses to which the water resources are put.

  - **Policy 2:** Surface water and groundwater quality shall be protected and improved where necessary.

City of Stockton General Plan 2035

The following goals and policies in the *City of Stockton General Plan 2035* relating to hydrology, water quality, and flood hazards are applicable to the proposed project.

Public Facilities and Services—Stormwater

- **Goal 4:** To manage stormwater in a manner that is safe and environmentally sensitive to protect people and property and to maintain the quality of receiving waters.

  - **Policy 4.1: Creek and Slough Capacity.** The City shall require detention storage with measured release to ensure that the capacity of downstream creeks and sloughs will not be exceeded. To this end:

    - Outflow to creeks and sloughs shall be monitored and controlled to avoid exceeding downstream channel capacities;

    - Storage facilities shall be coordinated and managed to prevent problems caused by timing of storage outflows.

  - **Policy 4.3: Best Management Practices.** The City shall require, as part of watershed drainage plans, Best Management Practices (BMPs), to reduce pollutants to the maximum extent practicable. As of November 25, 2003, the City shall require that all new development and redevelopment projects to comply with the post-construction BMPs called for in the Stormwater Quality Control Criteria Plan (SWQCCP), as outlined in the City's Phase 1 Stormwater NPDES permit issued by the California Water Quality Control Board, Central Valley Region (Order No. R5-20020-0181). Also the owners, developers, and/or successors-in-interest must establish a maintenance entity acceptable to the City to provide funding for the operation, maintenance, and replacement costs of all post-construction BMPs. The City shall require, as part of its Storm Water NPDES Permit and ordinances, to implement the Grading Plan, Erosion Control Plan, and Pollution Prevention Plan (SWPPP) during construction activities of any

improvement plans, new development and redevelopment projects for reducing pollutants to the maximum extent practicable.

- **Policy 4.6: Stormwater Facility Sizing.** The City shall ensure through the development review process that public facilities and infrastructure are designed to meet ultimate capacity needs, pursuant to a master plan, to avoid the need for future replacement to achieve upsizing. For facilities subject to incremental sizing, the initial design shall include adequate land area and any other elements not easily expanded in the future.

- **Policy 4.8: Low Impact Development.** The City shall incorporate low impact development (LID) alternatives for stormwater quality control into development requirements. LID alternatives will include: (1) conserving natural areas and reducing imperviousness, (2) runoff storage, (3) hydro-modification (to mimic pre-development runoff volume and flow rate), and (4) public education.

Health and Safety—Flood Hazard

- **Goal 6:** To minimize the risk to the community from flooding.

  - **Policy 6.5: Levee Maintenance.** The City shall encourage reclamation districts to institute a levee maintenance program to reduce levee failures.

  - **Policy 6.9: Cooperate with Flood Control Agencies and Support Regional Programs.** The City shall cooperate with appropriate local, State, and Federal agencies to address local and regional flood issues.

  - **Policy 6.10: Develop Flood Protection Plan for Levee Systems.** The City shall coordinate with appropriate State, federal, and local flood control agencies to develop a flood protection plan for the levee systems protecting the city. The plan shall identify the levees protecting the City and the entities responsible for operation and maintenance of the levees. The plan will determine the flood levels in the waterways and the level of protection offered by the existing levees along the waterways. A long-term plan will be developed to upgrade the system as necessary to provide at least a 100-year level of flood protection to the city. The City also commits to considering and revising the plan to reflect future appropriate State or federally mandated levels of flood protection in an effort to meet these applicable levels of flood protection.

4.6.4 IMPACTS AND MITIGATION MEASURES

SIGNIFICANCE CRITERIA

In accordance with Appendix G of the State *CEQA Guidelines*, an impact of the proposed project related to hydrology and water quality would be considered significant if project implementation would:

- violate any water quality standards or WDRs or otherwise substantially degrade surface-water or groundwater quality;

- substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the level of the local groundwater table;

- 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 that would result in substantial on- or off-site erosion or siltation;

- 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 on- or off-site flooding;
- create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map or within the 200-year flood zone as shown on the DWR "Best Available Maps" Web site;
- place within a 100-year flood hazard area structures that would impede or redirect flood flows;
- expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam; or
- result in inundation by seiche, tsunami, or mudflow.

As described above, the proposed project would result in a significant impact if it were to place housing within a 100- or 200-year flood zone. The 100-year flood zone has been the predominant flood protection standard for several decades. However, in response to flood concerns raised by such events as the devastation caused by Hurricane Katrina in New Orleans, the California Legislature enacted SB 5 in 2007, which will ultimately require that the Central Valley be protected from a 200-year flood in the future (see the description of state laws in Section 4.6.3, "Regulatory Considerations"). SB 5 provides for restrictions associated with privately proposed development projects and other projects considered by local agencies. It does not address projects proposed by the state. However, because the legislature has established that the 200-year level of flood protection is a goal for the Central Valley, this EIR uses the 200-year flood zone as a threshold of significance.

ISSUES NOT DISCUSSED FURTHER

No dams or detention basins exist upstream of the project site. Flood inundation maps prepared by the San Joaquin County Office of Emergency Services (San Joaquin County 2003) indicate that the project site and most of the Stockton area are within the flood hazard zone for New Hogan Dam and Camanche Lake. However, there is no substantial evidence to suggest that dam failure is likely, and the proposed project would do nothing to increase the potential for dam failure. Camanche Lake on the Mokelumne River is approximately 24 miles to the northeast of the project site. The New Hogan Dam on the Calaveras River is approximately 12 miles southeast of Camanche Lake. New Hogan Dam and Camanche Lake Dam (both completed in 1963) have not experienced dam failure.

PROJECT IMPACTS AND MITIGATION MEASURES

IMPACT HYDRO-1 **Short-Term, Construction-Related Violation of Water Quality Standards or Other Substantial Degradation of Water Quality.** *Extensive grading and movement of earth associated with project construction could generate sediment, erosion, and other nonpoint source pollutants in on-site stormwater, which could drain to off-site areas, degrading local water quality.* ***(Significant, less than significant with mitigation)***

Implementation of the proposed project would include substantial construction activities over approximately 144 acres, plus several off-site locations: the stormwater detention basin, utility alignments, and a 38-acre construction staging area. Soil removal, trenching, pipe installation, grading, and revegetation associated with project development would create the potential for soil erosion and sedimentation of stormwater drainage systems, both within and downstream of the project site. The construction process may also result in accidental

release of other pollutants that could ultimately flow to surface waters, including oil and gas, chemical substances used during construction, waste concrete, and wash water. Many construction-related wastes have the potential to degrade existing water quality by altering DO content, temperature, pH, suspended-sediment and turbidity levels, or nutrient content, or by causing toxic effects in the aquatic environment. Project construction activities that are implemented without mitigation could violate water quality standards or directly harm aquatic organisms.

Localized erosion hazards are relatively low because the project site is generally flat and the soil types on the site are known to have little erosion hazard (see Section 4.9, "Geology and Paleontology"). However, intense rainfall and associated stormwater runoff could result in short periods of sheet erosion within areas of exposed or stockpiled soils. If uncontrolled, these soil materials could cause sedimentation, blocking drainage channels. Further, soils could be compacted by heavy equipment, which may reduce the soils' infiltration capacity and increase the potential for runoff and erosion. Nonstormwater discharges could result from construction dewatering procedures, or from the discharge or accidental spilling of hazardous substances such as fuels, oils, concrete, paints, solvents, or cleaners.

The proposed project could adversely affect water quality within on-site drainage channels and ultimately off-site drainage channels as a result of temporary construction activities. Therefore, this impact would be significant.

Mitigation Measure(s) for Impact HYDRO-1:

Before any construction-related ground disturbance, CPR will consult with County Public Works staff members to ensure that project construction procedures are consistent with County stormwater requirements. CPR will also contact the SWRCB and the Central Valley RWQCB to obtain Section 401 water quality certification, a statewide NPDES stormwater permit for general construction activity, and any other necessary site-specific WDRs or waivers under the Porter-Cologne Act. CPR will prepare and submit the appropriate notices of intent and prepare the SWPPP and any other necessary engineering plans and specifications for pollution prevention and control. The SWPPP and other appropriate plans will identify and specify:

- BMPs to be used for erosion and sediment control, including construction techniques to reduce the potential for runoff as well as other measures to be implemented during construction (e.g., sedimentation ponds, inlet protection, perforated riser pipes, check dams, and silt fences);
- approved local plans and nonstormwater-management controls to be implemented, permanent postconstruction BMPs to be followed, and responsibilities associated with inspection and maintenance;
- the pollutants that are likely to be used during construction that could be present in stormwater drainage and nonstormwater discharges, and other types of materials used to operate equipment;
- spill prevention and contingency measures, including measures to prevent or clean up spills of hazardous waste and of hazardous materials used to operate equipment, and emergency procedures for responding to spills;
- personnel training requirements and procedures that will be used to ensure that workers are aware of permit requirements and proper installation methods for BMPs specified in the SWPPP; and
- the appropriate personnel responsible for supervising implementation of the SWPPP.

Where applicable, BMPs identified in the SWPPP will be in place throughout all site work and construction/demolition and will be used in all subsequent site development activities. BMPs may include such measures as the following:

- Implementing temporary erosion-control measures in disturbed areas to minimize discharge of sediment into nearby drainage conveyances. These measures may include silt fences, staked straw bales or wattles, sediment/silt basins and traps, geofabric, sandbag dikes, and temporary vegetation.

- Establishing permanent vegetative cover to reduce erosion in areas disturbed by construction by slowing runoff velocities, trapping sediment, and enhancing filtration and transpiration.

- Using drainage swales, ditches, and earth dikes to control erosion and runoff by conveying surface runoff down sloping land, intercepting and diverting runoff to a watercourse or channel, preventing sheet flow over sloped surfaces, preventing runoff from accumulating at the base of a grade, and avoiding flood damage along roadways and facility infrastructure.

All construction contractors will retain a copy of the approved SWPPP on the construction site.

Significance after Mitigation

Implementation of the mitigation measure for Impact HYDRO-1 would reduce short-term construction-related effects on drainage and water quality to a less-than-significant level. Several technical studies have been conducted regarding the impacts of water quality control features on groundwater (e.g., *Results of the Nationwide Urban Runoff Program* [EPA 1983] and *California Storm Water Best Management Practices Handbook* [CASQA 2003]) and surface water (e.g., *Cumulative Water Quality Analysis Report for the Lahontan Development 1996–2002* [Huffman & Carpenter 2003]). These studies have found that features providing water quality control (e.g., revegetation, erosion control measures, detention and infiltration basins), like those listed above for the proposed project, have been successful in controlling and avoiding impacts on water quality. (Metals and organic compounds associated with stormwater are typically lost within the first few feet of the soil of the retention basins associated with groundwater.) Technical studies associated with the 741-acre Lahontan Development (residential subdivision and golf course), constructed between 1996 and 2002 in Truckee, demonstrated that the use of a variety of BMPs (e.g., source control, detention basins, revegetation, and erosion control) can maintain surface water quality conditions in adjacent receiving waters (Huffman & Carpenter 2003).

IMPACT HYDRO-2 **Increase in Surface Runoff Potentially Exceeding the Capacity of Existing or Planned Stormwater Drainage Systems.** *The proposed project would increase surface runoff, which would result in an increase in both the total volume and the peak discharge rate of stormwater runoff, and therefore could result in greater potential for on- and off-site flooding. However, the project's drainage system would be designed to accommodate project-generated stormwater runoff from a 100-year storm event.* ***(Less than significant)***

The proposed project would encompass some already-developed areas (the Karl Holton Youth Correctional Facility) and some land that is currently in agricultural use (see Exhibit 4.6-2). As described in "Existing Drainage Facilities" above, the agricultural area currently drains to the unlined drainage channel, but the proposed project would realign the unlined drainage channel to convey stormwater along the northern boundary of the project site as shown in Exhibit 4.6-2. This realignment would allow the ditch to remain approximately the same length with the same slope and capacity (Kimley-Horn 2008:10). This channel is under the jurisdiction of the San Joaquin County Flood Control District. CPR would file a watercourse encroachment permit with the County before beginning the realignment work.

According to original construction plans, the detention basin measures 400 feet wide by 375 feet across (approximately 3.5 acres). The most shallow elevation point within the basin is at an elevation of 27.5 feet according to the original construction plans. The concrete lined channel that conveys stormwater from pump station no. 1 into the basin has a bank elevation near the pump station of 36.5 feet according to the original construction plans. During large storms, the detention basin begins to store water, which may cause a backwater effect on the concrete lined channel. An elevation of 35 feet is assumed to be the maximum allowable elevation in the reservoir, so as not to cause overtopping of the concrete lined channel during large storms. The operational

depth of the basin was conservatively assumed to be 7.5 feet, to account for the fact that sedimentation has probably occurred within the basin over time. Using that assumption, the basin (as shown on the original construction plans) storage volume is estimated at 25.8 acre-feet.

Aerial photographs and initial investigation of the detention basin revealed that the basin was actually built far larger than the construction plans show. The basin may actually have been built as large as 9 acres. The depth of the enlarged portion of the basin is unknown. If the depth of the added area of the basin is equivalent to the depth shown on the construction plans, the basin's operating volume could be as large as 67.5 acre-feet. A survey of the basin is underway to accurately determine the detention basin's as-built area and volume.

The detention basin can discharge water Littlejohns creek through a pump station (no. 2) located at the east end of the basin. The pump station has two pumps with a total estimated capacity of approximately 12,000 gpm. The proposed project would not result in any alteration to pump station no. 2, and would therefore not result in an increased discharge rate of stormwater to the creek under any design storm event up to the 100-year storm. NCYCC staff state that pumping into the creek has not been required within the recent past. Kimley-Horn (2008) performed a preliminary drainage study (included as Appendix F of this DEIR) that assessed the capacity of the existing drainage system and the operation and capacity of the detention basin. The study calculated the NCYCC facilities' runoff flow rates both in the existing condition and for the proposed project for the 10-year and 100-year storm events. The rational method, as described in Section D of the September 2007 *County of San Joaquin Hydrology Manual* (Hydrology Manual), was used in the analysis. The rational method relates rainfall intensity, the watershed's drainage area, and a runoff coefficient to estimated peak runoff flow rates and is used to estimate peak discharges from small developed areas that are usually less than 1 square mile. Rainfall intensity and duration values for the 10-year and 100-year storms and runoff coefficient equations from the Hydrology Manual were used in the drainage study. To calculate runoff coefficients, drainage areas for the site were delineated and amounts of pervious and impervious surfaces within each area were estimated using aerial photographs and ground surveys. As part of its hydrologic analysis, Kimley-Horn (2008) performed a confluence analysis that used the Hydrology Manual's procedures to evaluate the pumping, conveyance, and storage capacities of the existing storm drainage system and compare the existing capacities with those of the proposed system. The results of the confluence analysis are shown in Table 4.6-2.

Table 4.6-2
Summary of Runoff Flow Rates

Location	Flow Rates for the Existing Facility (cfs)		Flow Rates for the Proposed Project (cfs)	
	10-Year Storm	100-Year Storm	10-Year Storm	100-Year Storm
Point of Connection of Proposed Project	59.6	89.1	93.1	143.8
Downstream Segment of 42-Inch Storm Drain	106.5	160.8	134.4	207.5
Entering Pump Station No. 1	131.4	200.2	156.1	242.4

Notes:
cfs = cubic feet per second
Source: Kimley-Horn 2008

The results of the hydrologic analysis are summarized in Table 4.6-3. The storm drainage system should be able to convey flows from the 10-year storm event in accordance with County standards, and the detention basin would need to be able to adequately route stormwater flows from the 100-year storm event by temporarily storing stormwater in the basin and pumping it out slowly over time into Littlejohns Creek. Numbers shown in bold in Table 4.6-3 indicate that the existing facility is undersized for these conditions and this storm frequency. The results show that all of the major facilities except the concrete-lined channel are undersized for the 10-year storm, and all major facilities are undersized for the 100-year storm. Therefore, no additional capacity within the existing system is available to convey the increased runoff from the proposed project.

The study showed that the detention pond is not sized to adequately retain the 100-year storm runoff volume, and therefore cannot be considered a "retention basin" per San Joaquin County standards. A detention basin routing calculation was performed as part of the drainage study, which showed a required storage capacity of approximately 37 acre-feet to meet County standards for detention basins. The actual storage capacity of the detention basin will be verified by a survey during preliminary design of the drainage facilities for the proposed project and improved if necessary.

Table 4.6-3
Existing and Proposed Project Runoff Capacities

Existing Facility	Facility Capacity	10-Year Storm Volumes		100-Year Storm Volumes	
		Existing	Proposed	Existing	Proposed
42-Inch Storm Drain	31.8 cfs	**106.5 cfs**	**134.4 cfs**	**160.8 cfs**	**207.5 cfs**
Pump Station No. 1	56.1 cfs	**131.4 cfs**	**156.1 cfs**	**200.2 cfs**	**242.4 cfs**
Concrete-Lined Channel	241.6 cfs	131.4 cfs	156.1 cfs	200.2 cfs	**242.4 cfs**
Detention Basin	TBD	NA	NA	**66.8 af**	**90.9 af**

Notes:
af = acre-feet; cfs = cubic feet per second; NA: not applicable for 10-year retention
Bold type indicates that the existing facility is undersized for these conditions and this storm frequency.
Source: Kimley-Horn 2008

Based on the difference between the system's capacity and the calculated peak-flow rates, it seems that flooding during significant rain events should have occurred at some point in the past. A possible explanation as to why flooding has not been observed is that with the flat terrain, a significant amount of ponding could be occurring before runoff enters the storm drain system, effectively attenuating the peak-flow rate.

Under the proposed system, a new 66-inch gravity storm drain pipe would be constructed from the project site to a new stormwater pump station adjacent to the existing detention basin. A storm drain of this size would provide sufficient capacity for the estimated flows from the proposed project. (Kimley-Horn 2008:12). As shown in Exhibit 4.6-2, the storm drain would be aligned immediately to the east of the NCYCC property, outside of the existing fence line. Runoff from the project site would be conveyed by the proposed system and would not flow through the existing NCYCC facilities. The existing detention basin (see Exhibit 4.6-3) is being surveyed to more accurately calculate the actual storage capacity, and minor improvements would be undertaken if necessary to attain the required capacity to operate as a detention basin per county standards, under proposed project 100-year storm conditions. A new stormwater pump station would be constructed for the proposed system, with an estimated footprint of 2,500 square feet and a peak pumping rate of 100 cfs. The existing stormwater Pump Station No. 2 would remain unchanged, maintaining the current maximum discharge rate to Littlejohns Creek. Final designs and specifications for the project's drainage system are currently being prepared. The system will be designed to appropriately accommodate the stormwater runoff generated from the proposed project during a 100-year storm event. In addition, although the project is not required to comply with policy and ordinance requirements of local agencies, as part of the final design process, CPR would coordinate with the San Joaquin Area Flood Control Agency and the San Joaquin County Flood Control and Water Conservation District to ensure that the proposed drainage and flood control is consistent with local requirements. For these reasons, the proposed project would not substantially increase the rate or amount of surface runoff in a manner that would result in on- or off-site flooding. This impact would be less than significant.

Mitigation Measure(s) for Impact HYDRO-2:

No significant impacts would occur, so no mitigation measures are required.

IMPACT HYDRO-3 **Potential Violation of Water Quality Standards or Other Substantial Degradation of Water Quality Resulting from Project Operation.** *The proposed project could increase the level of long-term discharges of urban contaminants to the stormwater drainage system, but stormwater quality control measures and BMPs, including the operation of the expanded detention basin, would reduce this projected increase . (Less than significant)*

A large portion of the project site is currently developed with structures associated with the former Karl Holton Youth Correctional Facility. Among these structures is the former auto shop, which is the likely source of the facility's on-site soil contamination (see Section 4.10, "Hazards and Hazardous Materials," for a more detailed discussion of the on-site soil contamination). Therefore, the existing development on the project site contributes to discharges of urban contaminants, such as oil, grease, trace metals, organics, and trash, into the stormwater drainage system. The proposed project would increase the footprint of development on the site, adding substantial amounts of impervious surfaces such as roadways and parking areas, which could increase the level of urban contaminants discharged into the stormwater drainage system.

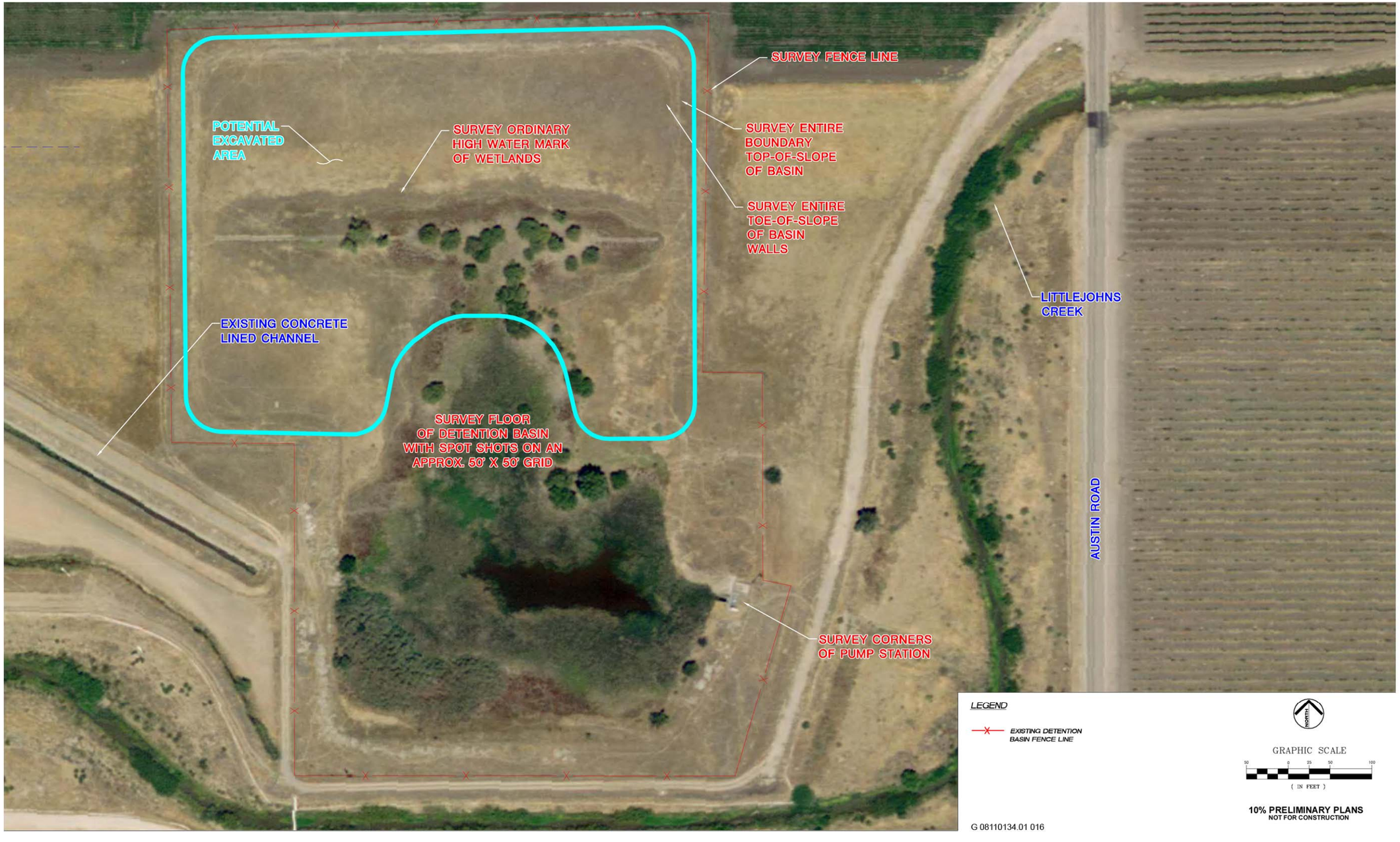
The project area is not included within the City of Stockton urbanized area, which also includes some areas outside of the current City limits that are subject to the City and County's joint stormwater NPDES permit. The City and County have implemented Storm Water Management Plans (SWMPs) (Larry Walker Associates 2003) to comply with Phase I and Phase II NPDES requirements. The SWMPs describe required programs including public education and outreach, detection and elimination of illicit discharges and connections, construction site runoff control, post-construction runoff control (including the implementation of BMPs), system maintenance, and performance monitoring. As part of the NPDES program, the City and County require the use of the Stormwater Quality Control Plan (Larry Walker Associates, 2008) for new projects within the permitted area, which includes recommended BMPs for various types of developments. In the future, the urbanized limits of the City of Stockton are likely to expand. It is possible that the proposed medical and mental health care facility and NCYCC would be required to comply with the NPDES permit in the future. For this reason, the City's Stormwater Quality Control Plan will be utilized by the for design and implementation of BMPs that will satisfy City and County NPDES program requirements, even though the project is not currently required to comply with the permit.

Because all of the runoff from the NCYCC and the project site would be directed through the detention basin, this basin would most likely be the system's major BMP component (CPR 2008:35). Detention basins can remove a high percentage (i.e., greater than 75%) of sediments and bacteria (City of Stockton 2003:5-2). Additionally, because the detention basin will be appropriately sized for the 100-year storm, many of the smaller more frequent storms will not result in any discharge to Littlejohns Creek, and the runoff will infiltrate and evaporate in the detention basin.

The permanent BMPs to be utilized in the stormwater treatment system (CPR 2008:32–36) have been shown to be effective in reducing the levels of contaminants in urban runoff (EPA 1999, CASQA 2003). The design criteria described in detail in these standards have been designed to comply with the requirements of the Central Valley RWQCB's basin plan, which are intended to protect the designated beneficial uses of the San Joaquin River and its tributaries, as described above under "Water Quality Control Plan for the Sacramento–San Joaquin River Basins." Therefore, this impact would be less than significant.

Mitigation Measure(s) for Impact HYDRO-3:

No significant impacts would occur, so no mitigation measures are required.



Source: Adapted by EDAW 2008

Stormwater Detention Basin **Exhibit 4.6-3**

IMPACT HYDRO-4 Potential for Flooding On- and Off-Site, Including Inundation from the 100-Year Flood. *The project's stormwater facilities would be adequate to assure that the project would not result in the substantial flooding of on- or off-site areas. The proposed project is not located within the 100-year flood zone. No dams or detention basins are located upstream of the site. (Less than significant)*

As described in Impact HYDRO-2 above, the proposed project would provide stormwater facilities adequate to assure that the project would not result in the substantial flooding of on- or off-site areas. As described in "Regional Setting" above, FEMA's 2002 Flood Insurance Rate Map shows the project site and the off-site components of the proposed drainage system located within Zone C, which is defined as "areas of minimal flooding"; therefore, these areas are not located within the 100-year flood zone. No dams or detention basins are located upstream of the site. Flood inundation maps prepared by the San Joaquin County Office of Emergency Services indicate that the proposed project and most of the Stockton area are within the flood hazard zone for the New Hogan Dam and Camanche Lake (San Joaquin County 2003). However, there is no substantial evidence to suggest that dam failure is likely, and the proposed project would do nothing to increase the potential for dam failure. Therefore, this impact would be less than significant.

Mitigation Measure(s) for Impact HYDRO-4:

No significant impacts would occur, so no mitigation measures are required.

IMPACT HYDRO-5 Potential for Exposure to 200-Year Flood (Pursuant to SB 5). *The project site is located outside of the 500-year flood zone, and therefore does not require 200-year flood protection as required by SB 5. (Less than significant)*

Under SB 5 (Chapter 364, Statutes of 2007), as of 2015 city and county legislative bodies will be prohibited from approving discretionary development projects and ministerial residential projects unless they can make one of three findings about the existing or proposed levels of flood protection within the respective project areas. One such finding (California Government Code, Section 65865.5[a][3]) is that:

> The local flood management agency has made adequate progress on the construction of a flood protection system which will result in flood protection equal to or greater than the urban level of flood protection in urban or urbanizing areas or the national Federal Emergency Management Agency standard of flood protection in nonurbanized areas for property located within a flood hazard zone, intended to be protected by the system. For urban and urbanizing areas protected by project levees, the [200-year] urban level of flood protection shall be achieved by 2025.

As described in the discussion of thresholds of significance above, although CPR is not subject to local planning approvals, it is using the 200-year level of flood protection as a threshold of significance.

The 2002 Flood Insurance Rate Map (FEMA 2008a) indicates that the proposed project and the off-site components of the proposed drainage system are within an area identified as Zone C (unshaded). FEMA indicates that the areas of minimal flood hazard, which are the areas outside the Special Flood Hazard Area and higher than the elevation of the 0.2%-annual-chance flood (i.e., outside of the "500-year" flood zone), are labeled Zone C or Zone X (unshaded) (FEMA 2008b). Because the project site is located in an area outside of the 500-year flood zone, the project would not need to provide any additional flood protection in compliance with the provisions of SB 5. Furthermore, DWR has released "best available information" related to property located within areas subject to flooding during 200-year storm events. The preliminary map indicates that, based on best available information, the project would not be located within such an area (DWR 2008). This impact would be less than significant.

Mitigation Measure(s) for Impact HYDRO-5:

No significant impacts would occur, so no mitigation measures are required.

IMPACT HYDRO-6 Reduction in Available Groundwater Supply Because of Substantial Interference with Groundwater Recharge. *The proposed project would create additional impervious surfaces in the form of new prison housing facilities and associated program space and infrastructure, which could reduce infiltration of precipitation into the groundwater. However, a large portion of the project site is currently developed with existing impervious surfaces (roadways, sidewalks, and structures), and the total percentage of impervious surface proposed is small in relation to the overall NCYCC area. This increase would not measurably affect recharge to the local groundwater basin. (Less than significant)*

As explained in Section 4.13, "Water Supply," of this EIR, groundwater modeling in the water supply evaluation for the EIR for the *City of Stockton General Plan 2035* showed that for all years through 2035, groundwater extraction would be below the threshold of 0.75 acre-feet per year and below the projected sustainable yield of the aquifer and basin. The water supply evaluation indicates that in the dry-year conditions, adequate water supplies are available and the average sustainable groundwater yield can be met while not exceeding the maximum groundwater yield in any one hydrologic year type. The small percentage of impervious surface that would result from the proposed project would not significantly affect groundwater recharge, because groundwater in San Joaquin County moves from sources of recharge to areas of discharge, and most recharge to the aquifer system occurs from the Delta and along active stream channels where extensive sand and gravel deposits exist (City of Stockton 2005:35). Therefore, this impact would be less than significant.

Mitigation Measure(s) for Impact HYDRO-6:

No significant impacts would occur, so no mitigation measures are required.