4.8 HYDROLOGY AND WATER QUALITY

4.8.1 INTRODUCTION

The Hydrology and Water Quality chapter of the EIR describes existing drainage patterns on the project site/Biological Resources Preservation Alternative (BRPA) site, current stormwater flows, and stormwater infrastructure. The chapter also evaluates potential impacts of the Proposed Project and BRPA with respect to increases in impervious surface area and associated stormwater flows, degradation of water quality, and increases in on- and off-site flooding. Information used for the chapter was primarily drawn from the Drainage System and Flood Control Analyses (Drainage Report) prepared for both the Proposed Project (see Appendix K)[1] and the BRPA by Cunningham Engineering (see Appendix L),[2] the 2-Dimensional Hydraulic Modeling reports prepared for both the Proposed Project and the BRPA by Rick Engineering Company (see Appendix M and Appendix N),[3,4] and a Drainage Channel Evaluation prepared by Geocon Consultants, Inc. (Geocon) to evaluate historical groundwater data (Appendix O).[5] In addition, information was drawn from the City of Davis General Plan[6] and the City of Davis General Plan EIR.[7] Issues associated with water supply availability are addressed in Chapter 4.14, Utilities and Service Systems, of this EIR.

4.8.2 EXISTING ENVIRONMENTAL SETTING

The section below describes regional hydrology, the existing drainage patterns within the project site, including peak flows, existing water quality, and groundwater conditions.

Regional Hydrology

The 497.6-acre project site/BRPA site is located north of East Covell Boulevard, east of F Street, and west of Pole Line Road in a currently unincorporated portion of Yolo County, California. According to the General Plan EIR, the Sacramento River and the Yolo Bypass drain Yolo County, which is part of the Sacramento River Flood Control Project. The largest surface waterway in the region is Putah Creek, which drains approximately 600 square miles. Other major waterways that drain unincorporated County areas around the City include Willow Slough Bypass to the north, which empties into the Yolo Bypass. Willow Slough Bypass is a leveed channel that drains approximately 204 square miles and receives flows from Willow, Cottonwood, Chickahominy, and Dry Sloughs south of Cache Creek.

The soils in the eastern portion of Yolo County contain high amounts of clay, which limits infiltration rates and consequently causes high runoff rates. Flooding has frequently occurred in Willow Slough, Dry Slough, and Davis area watersheds north of Putah Creek. Yolo County has

1 Cunningham Engineering. *Drainage System and Flood Control Analysis for Village Farms Davis*. August 8, 2024.
2 Cunningham Engineering. *Drainage System and Flood Control Analysis for Village Farms Davis Biological Resources Preservation Alternative*. August 8, 2024.
3 Rick Engineering Company. *Village Farms Project: 2-Dimensional Hydraulic Modeling*. July 8, 2024.
4 Rick Engineering Company. *Village Farms Project: Biological Wetland Avoidance Alternative: 2-Dimensional Hydraulic Modeling*. July 8, 2024.
5 Geocon Consultants, Inc. *Drainage Channel Evaluation, Village Farms Davis, Davis, California.* July 2024.
6 City of Davis. *City of Davis General Plan*. Adopted May 2001, Amended January 2007.
7 City of Davis. *Final Program EIR for the City of Davis General Plan Update and Final Project EIR for Establishment of a New Junior High School*. Certified May 2001.

been mapped by the Federal Emergency Management Agency (FEMA) as being part of the National Flood Insurance Program (NFIP), which identifies areas of potential flooding and their associated risks.

Flooding tends to increase in the Davis area when either flood waters from western Yolo County exceed the capacity of creeks and sloughs flowing easterly near Davis (e.g., flows in Dry Creek west of Davis have frequently caused flooding in the Davis area), and/or when flood waters from the Sacramento River back up into the Yolo and Willow Slough Bypasses, impeding gravity flow from the systems. Floodwaters from local drainages subsequently back up and pond behind the levees of the bypasses until flood flows in the bypasses recede. In addition, a dam inundation study prepared for the Bureau of Reclamation shows that flooding would occur in Davis if Monticello Dam (Lake Berryessa) on Putah Creek, 23 miles west of Davis, were to fail.

Flood protection for the City from the Sacramento River is provided by storage and flood control projects upstream on the Sacramento River and on tributaries to the Sacramento River. Internal drainage within the Davis City Limits is captured by various storm drain collection systems and detention ponds. The ponds provide storage and reduce peak flood flows to the channels that flow to Willow Slough Bypass or the Yolo Bypass.

Project Site and Surrounding Area Drainage

The project site/BRPA site is undeveloped and consists primarily of irrigated farmland. A drainage course, the Covell Drain (Channel A), along with its associated non-native riparian corridor, cuts from east to west across the site. The site is relatively flat with elevations ranging from 35-45 feet with a general slope to the west and toward Channel A at approximately 0.2 percent to 0.3 percent slope. All on-site agricultural fields are actively farmed. One of the on-site fields south of Channel A contains a large seasonal wetland or alkali playa, as well as other smaller wetlands. In addition, limited development occurs on-site in the form of one agricultural structure located in the southern portion of the site.

The project site/BRPA site lies within the Covell Drain watershed. The Covell Drain watershed is approximately 17 square miles, primarily upstream of the site, draining to the east to the Willow Slough Bypass, approximately 2.3 miles east of the site (see Figure 4.8-1).

Off-Site Inflow

The primary inflow to the project site/BRPA site is from the Covell Drain (Flow #1) (see Figure 4.8-2); entering at the northwest corner of the site through dual box culverts under F Street and the Union Pacific Railroad (UPRR) tracks. Flows also enter the site from the F Street Channel (Flow #6) and Northstar Pond Discharge (Flow #5) at a trestle undercrossing of the Railroad tracks. The Northstar Pond, located west of F Street, provides storm water detention, which is then pumped across F Street to the trestle crossing at the city-maintained Storm Drain Pump Station #2 (SDS #2). Flow in the F Street channel originates from two primary sources; the first is the H Street Pump Station (SDS #3) and second is the Cannery Pump Station (Flow #12). Flow from both pump stations is discharged into the F Street Channel and flows overland northerly and combines with the Northstar Pump Station flow, which then flow east under the railroad trestle crossing into the project site. In high flow conditions, storm water north of the project site from the North Davis Channel, overwhelms the capacity of the existing channel and spills south into the existing farm field (Flow #7).

Figure 4.8-1
Project Area

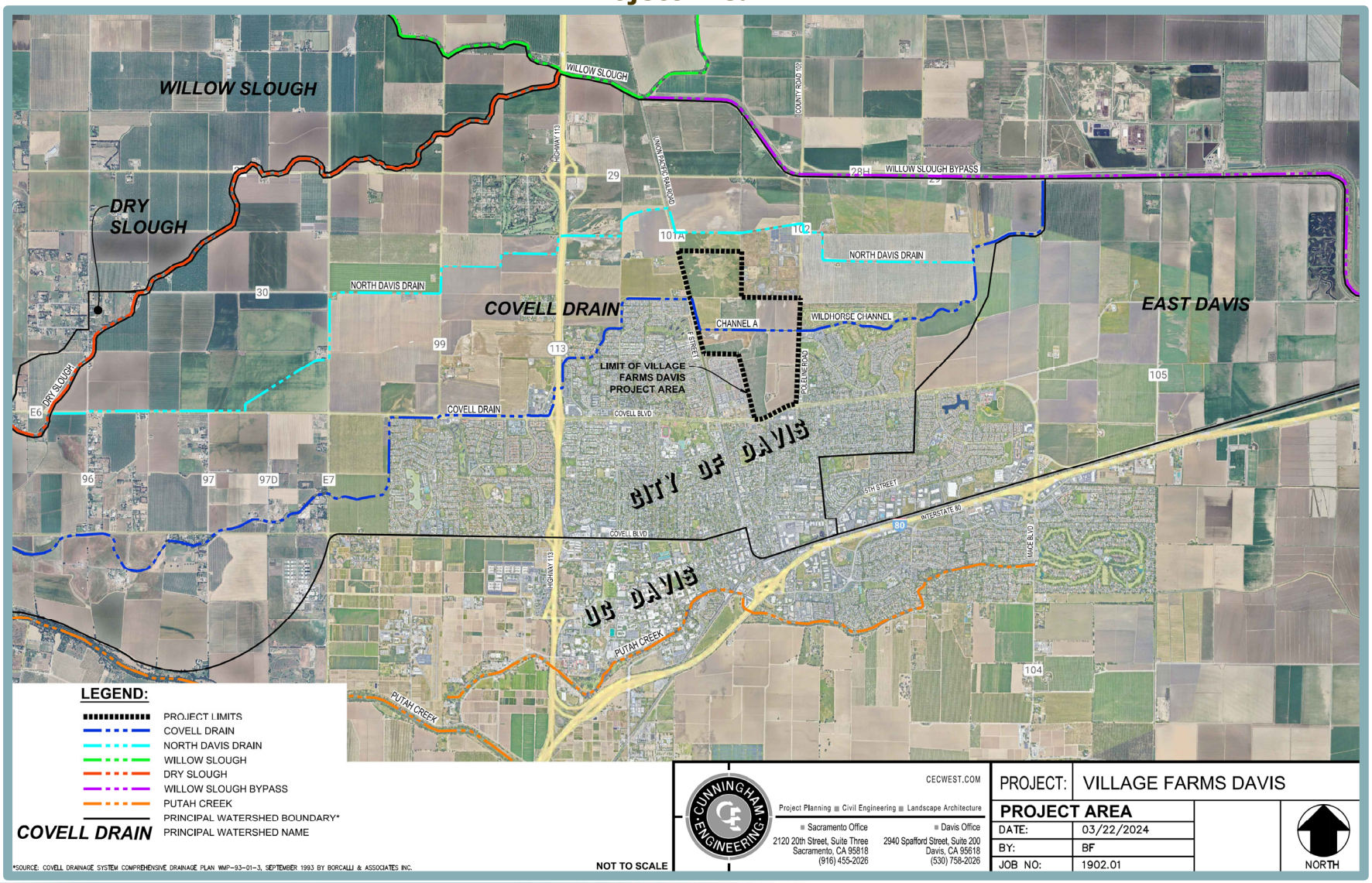
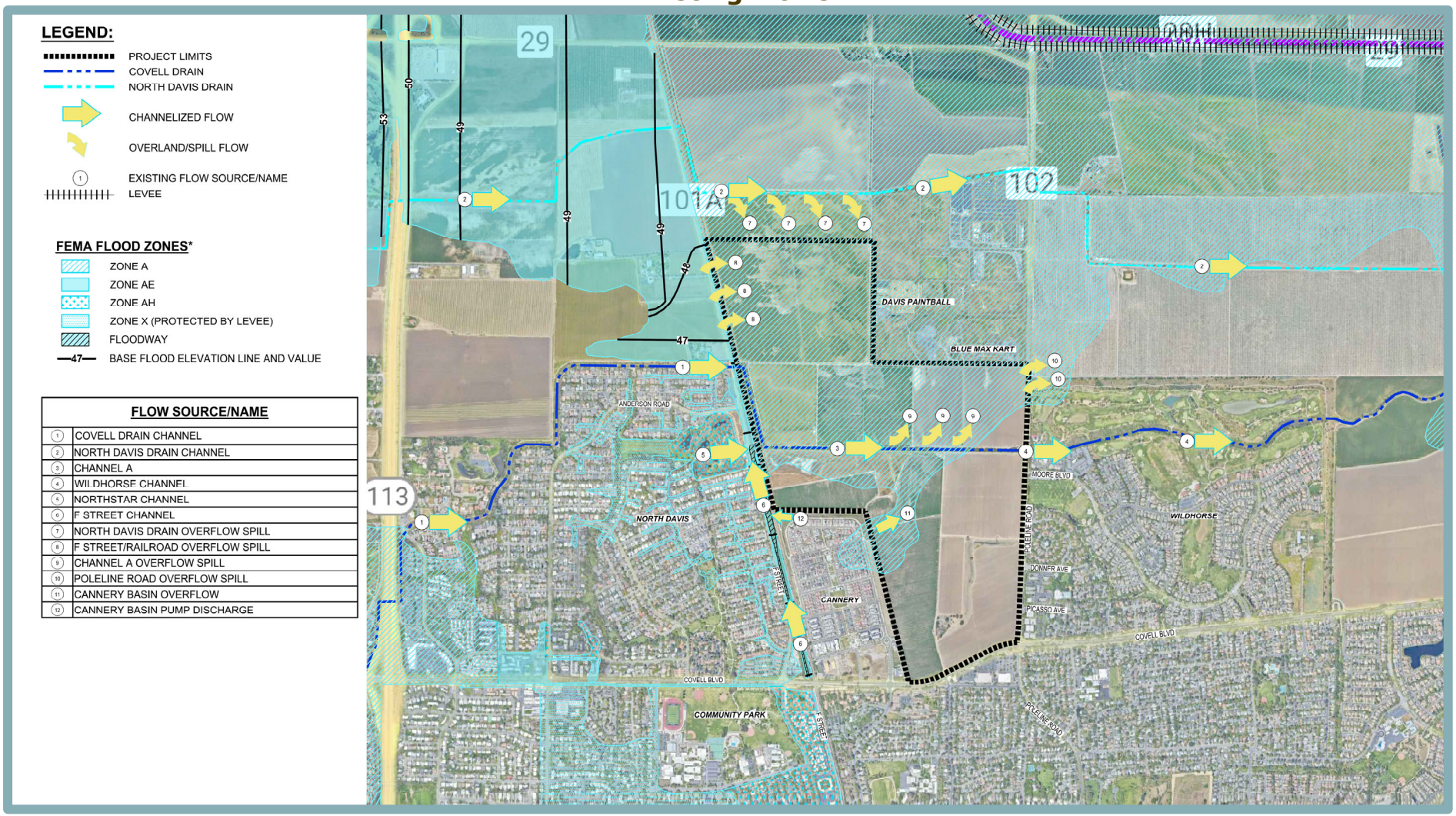


Figure 4.8-2
Existing Flows



The North Davis Drain channelized flow (Flow #2) also overwhelms the channel capacity west of F Street, resulting in shallow flooding of the farm fields and ultimately overtopping F Street and the Railroad (Flow #8).

Storm water flows from the aforementioned locations continue as shallow overland flow southerly across the farm fields and enters the project site, combining with the storm water from the Covell Drain and F Street channel. In high flow storm water events, storm water contained in the Cannery detention basin, located around the northern and eastern perimeter of the Cannery, overtops a concrete weir and flows overland eventually entering Channel A flows onsite.

Flow Through Project Site

The storm water flow through the project site generally flows within Channel A (Flow #3). Flow from the Covell Drain entering at the northwest corner of the project site, turns south and flows southerly as channelized flow, parallel to the UPRR, following the Covell Drain line (see Figure 4.8-2). After flowing south approximately 1,400 feet, the Covell Drain flow merges with the incoming flows from the F Street channel at the trestle crossing. Flows turn and flow easterly through the project site in Channel A (Flow #3) approximately 4,300 feet to Pole Line Road. During high flow conditions, storm water overtops Channel A and spills to the north into the farm field. The overflow continues flowing overland to the northeast corner and begins ponding, eventually overtopping Pole Line Road. As discussed above, flows from the Cannery overflow weir flow overland across the farm fields, eventually intersecting Channel A and continuing east to Pole Line Road.

Project Site Outflow

Storm water flows from Channel A, and the overtopping shallow flows are directed west to Pole Line Road. Flows contained within Channel A continue east through two box culverts, then continue as channelized flow within the Wildhorse Channel (Flow #4). Flows from the shallow flooding at the northeast corner of the property ultimately overtop Pole Line Road (Flow #10) and flow northeast across the farm fields intersecting the Channelized flow in North Davis Channel (Flow #2). Storm water flow continues in Wildhorse Channel east out of the City, continuing north and merging with the North Davis Channel flows and continuing north, discharging into the Willow Slough Bypass. Discharge into the Willow Slough Bypass is regulated by flap gates in the culverts penetrating the levees; during peak flows in the Willow Slough Bypass, the flap gates remain shut. During this condition, flow from the Covell Drain watershed spills east out of the channelized flow and flows overland into the East Davis watershed resulting in ponding and flooding through the eastern reaches of the watershed.

Existing Stormwater Infrastructure

The only existing storm water infrastructure on the project site is Channel A. With respect to immediately adjacent storm water infrastructure, the City of Davis maintains a storm drain pipe network within the Cannery development to the southwest, within Pole Line Road to the east and within Covell Boulevard to the south. These existing networks remain hydraulically isolated from the project development.

Flooding

The project site/BRPA site is depicted on FEMA Flood Insurance Rate Map (FIRM) numbers 06113C0603G and 06113C0611G, both effective June 18, 2010. Both FIRMs were revised by Letter of Map Revision (LOMR) 20-09-2115R, effective August 15, 2022. The LOMR revised the

mapped flooding adjacent to the site, but in coordination with the engineers that prepared the LOMR, flow from the study revision does not impact the site. The northern portion of the site is within FEMA Zone A (see Figure 4.8-2). Zone A is defined as areas which are determined to flood during the one percent annual flood event. Flood plain depths vary across the project area from zero to over three feet. Flood depths in excess of three feet are located within the conveyance channels and along the northerly boundary of the site, adjacent to the Blue Max Kart facility.

Surface Water Quality

Activities and/or conditions that have the potential to degrade water quality include, but are not limited to, construction activities and urban stormwater runoff. Construction activities have the potential to cause erosion and sedimentation associated with ground-disturbing and clearing activities, which could cause unstabilized soil to be washed or wind-blown into nearby surface water. In addition, the use of heavy equipment during construction activities, especially during rainfall events, has the potential to cause petroleum products and other pollutants to enter nearby drainages.

Water quality degradation from urban stormwater runoff is primarily the result of runoff carrying pollutants from the land surface (i.e., streets, parking lots, etc.) to the receiving waters (i.e., streams and lakes). Pollutants typically found in urban runoff include facility maintenance and lawn-care/landscaping chemicals (insecticides, herbicides, fungicides and rodenticides), heavy metals (such as copper, zinc and cadmium), oils and greases from automobiles and other mechanical equipment, and nutrients (nitrogen and phosphorus).

According to the City's General Plan EIR, pollutant concentrations in Davis surface water are highly variable, depending on urban densities, land uses, and the time since the last rains that produced surface runoff. The Covell Drain and other surface drainage ditches are typically intermittent and often do not have appreciable surface flow during the dry season. During the low-flow periods, surface water from the Covell Drain and Channel A may contain detectable amounts of agricultural pollutants, such as pesticides, herbicides, and fertilizers from agricultural return water. The Covell Drain could also contain some pollutants associated with urban runoff from the Stonegate watershed in west Davis.

Groundwater

The project site/BRPA site is located within the Yolo Subbasin and the jurisdiction of the Yolo Subbasin Groundwater Authority (YSGA). The YSGA was formed in 2017 in order to comply with the requirements of the Sustainable Groundwater Management Act (SGMA). The goal of the YSGA is to manage the entire Yolo Subbasin by protecting against overdraft and creating sustainable water supplies.

According to the Groundwater Sustainability Plan for the Yolo Subbasin, the local aquifer system can be delineated into three zones. The shallow zone extends from the surface to a depth of approximately 220 feet and is predominantly alluvium (and the top of the upper Tehama Formation). The intermediate zone extends from depths of approximately 220 to 600 feet and is entirely within the upper Tehama Formation, believed to be largely alluvial plains with distributary channel and sheet flood sands interbedded in silts and clays. The deposits are believed to be slightly more consolidated than the shallow zone, although the coarser beds may remain loose. The deep zone extends from depths of approximately 600 to 1,500 feet within the upper Tehama

Formation. The lower Tehama Formation (generally below a depth of 1,500 feet) is not typically utilized for groundwater extraction.[8]

The Yolo Subbasin is not identified by the California Department of Water Resources (DWR) as being in a state of overdraft.[9] Groundwater overdraft is a condition within a developed groundwater basin in which the amount of water pumped from the basin exceeds the sustainable yield of the basin over the long term.

The Drainage Channel Evaluation prepared by Geocon Consultants, Inc. (Geocon) evaluated historical groundwater data from a variety of sources and charted the data, as shown in Figure 4.8-3 (Appendix O).[10] As shown in Figure 4.8-3, the substantial majority of the data points are below 26.5 feet above mean sea level (amsl), which is the proposed bottom of the on-site detention basin and associated channel, which is further discussed under Impact 4.8-4. The storm water detention basin in the Cannery Subdivision has a base elevation ranging from 25.5 to 27.5 feet amsl, and City staff has not observed any groundwater seepage into the Cannery detention basin.[11]

Anomalously high and low groundwater elevations were reported by Wallace-Kuhl & Associates (WKA) for the 2018 and 2019 dry seasons (see Figure 4.8-3). For example, the depth to water in monitoring well DM-MW-1 was reported as 9.93 feet on September 12, 2018, 22.34 feet on September 26, 2018, and 10.40 feet on July 20, 2019. The reported elevations are not typical of dry-season conditions.

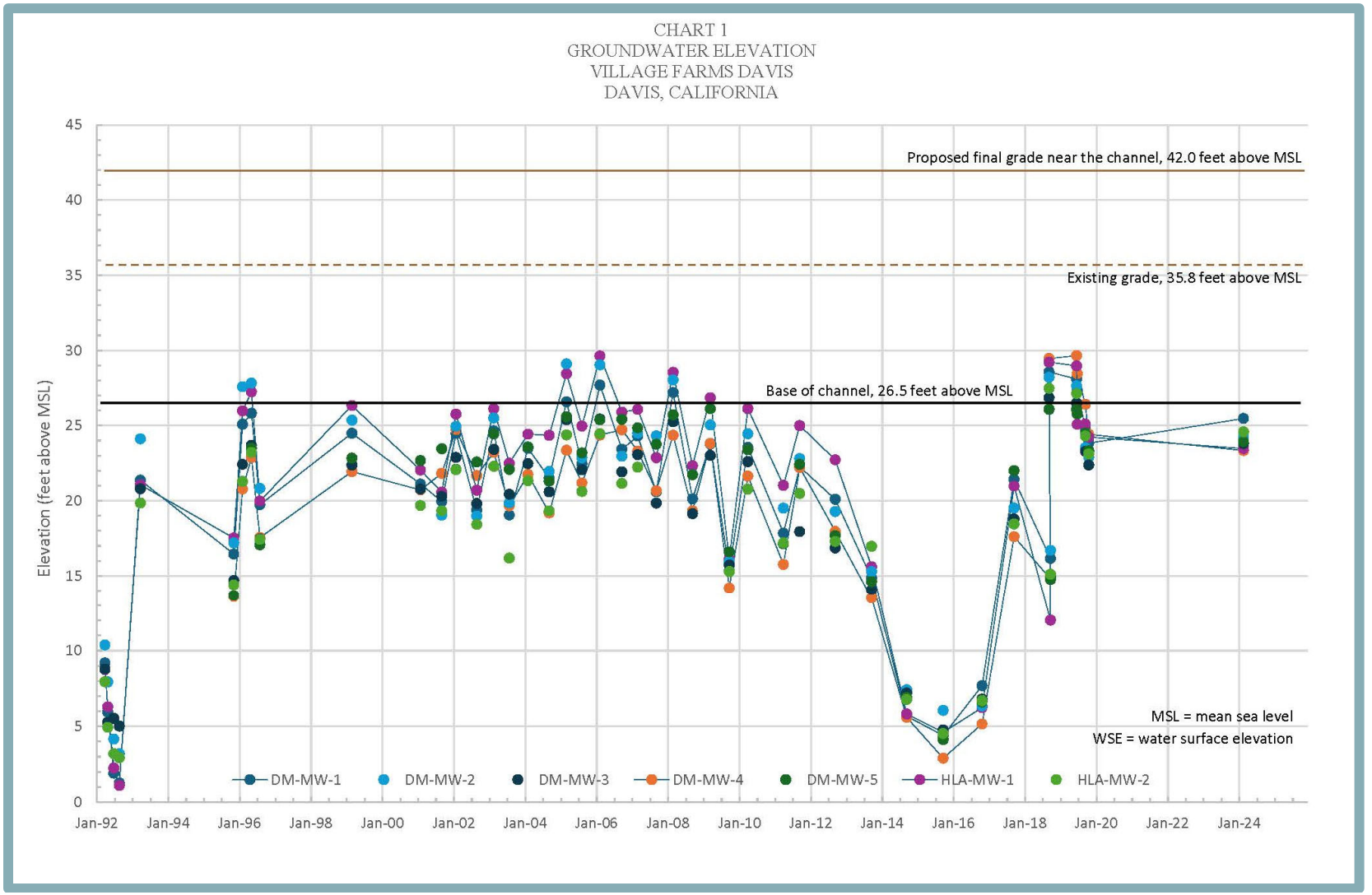
The Drainage Channel Evaluation also notes that the reported flow direction for shallow groundwater has varied with time. Dames & Moore (1996) reported that the groundwater flow direction was generally southeast during winter months and southwest during summer months as a result of groundwater extraction at the Hunt-Wesson plant southwest of the project site/BRPA site.

More recently, the City and WKA have reported that the groundwater flow direction is generally northeast. The change in groundwater flow direction may be a result of changes in land use and groundwater pumping in the vicinity, such as the following:

- cessation of groundwater extraction at the Hunt-Wesson facility southwest of the project site/BRPA site;
- development of the Wildhorse subdivision and golf course, east of the site, in the late 1990s;
- development of the Cannery subdivision, south and west of the site in 2015; and
- groundwater extraction associated with the cultivation of agricultural fields at the site, which recommenced in 1999 after a decade of laying fallow.

8 Yolo Subbasin Groundwater Agency. *2022 Groundwater Sustainability Plan*. Adopted January 24, 2022.
9 California Department of Water Resources. *California's Critically Overdrafted Groundwater Basins.* January 2020.
10 Geocon Consultants, Inc. *Drainage Channel Evaluation, Village Farms Davis, Davis, California.* July 2024.
11 *Ibid* [page 9].

Figure 4.8-3
Groundwater Elevation Data



Source: Geocon, 2024.

Universal Engineering Sciences (UES), in their monitoring of the Old Davis Landfill to the north,[12] reported that the calculated groundwater elevations based on depth-to-water measurements in the monitoring wells indicated that the groundwater gradient was "radiating out from around DM-MW-1" and, therefore, a singular direction of groundwater flow could not be calculated.

Information provided by the City indicates that groundwater infiltration has not been observed by City staff in the storm water detention basin associated with the Cannery Subdivision immediately southwest of the project site/BRPA site. Improvement plans for the Cannery Subdivision specify base elevations for the detention basin ranging from 25.5 to 27.5 feet amsl.

As noted in Chapter 4.7, Hazards and Hazardous Materials, of this EIR, according to multiple records reviewed as part of the Urban Development Area Phase I ESA prepared for the project site, groundwater beneath the project site/BRPA site appears to have been impacted by the former landfill and is considered a potential Recognized Environmental Condition (REC).

UES was retained by the City of Davis in 2024 to prepare a Groundwater Monitoring Report for the Old Davis Landfill and evaluate current groundwater conditions beneath and in the vicinity of the Old Davis Landfill. Groundwater monitoring and sampling of existing groundwater monitoring wells was conducted in February 2024. See Chapter 4.7, Section 4.7-2, and Figure 4.7-1, for a detailed description of the groundwater monitoring wells on the project site and Old Davis Landfill.

Eight contaminants were found to exceed the Maximum Contaminant Level (MCLs) set forth by the United States Environmental Protection Agency (USEPA) and/or State of California. MCL is defined by the USEPA as the highest level of a contaminant that is allowed in drinking water and are enforceable standards.

Based on a review of regional water quality data, UES concluded that aluminum, arsenic, selenium, and nitrate can be attributed to larger regional trends because water districts and regulatory agencies in the region and across the central valley have reported levels of these analytes above MCLs and at similar concentrations reported in the monitoring wells associated with Old Davis Landfill. UES concluded that the detected concentrations of aluminum, arsenic selenium, and nitrate are not specifically connected to activities at the Old Davis Landfill.

In contrast, the detected per- and polyfluoroalkyl substances (PFAS) compounds and manganese appear to originate from the Old Davis Landfill. On April 10, 2024, the USEPA announced the final National Primary Drinking Water Regulation (NPDWR) for six PFAS compounds. Six legally enforceable MCLs were established with this ruling, including MCLs for perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), perfluorohexane-sulfonic acid (PFHxS), perfluorononanoic acid (PFNA), hexafluoropropylene oxide dimer acid (HFPO-DA), and certain compound mixtures. Three PFAS compounds exceeded their respective USEPA water quality standards in five monitoring well water samples, as explained below.

PFOA was detected in one on-site groundwater monitoring well (DM-MW-4) at a concentration of 29 nanograms per liter (ng/l), which exceeds the recently established USEPA Primary MCL for PFOA in drinking water (4 ng/l). PFOS was detected at concentrations of 1,100 ng/L, 320 ng/L, 29 ng/L, and 13 ng/L in water samples collected from monitoring wells DM-MW-1, DM-MW-3, DM-

[12] Universal Engineering Sciences. *Groundwater Monitoring Report, Old Davis Landfill, Davis, California*. April 19, 2024.

MW-4, and DM-MW-5, respectively. PFHxS was detected at a concentration of 13 ng/L in DM-MW-1 which exceeded the USEPA MCL of 10 ng/L.

The high concentrations of PFAS detected at the Old Davis Landfill are not seen in the wider regional setting, and, therefore, PFAS concentrations in groundwater likely originate from the Old Davis Landfill. Elevated concentrations of PFAS were not detected in the source water for the City's drinking water supply system, indicating that the apparent landfill contamination is not currently impacting the drinking water supply.

Manganese was detected at concentrations ranging from 29 to 340 micrograms per liter (µg/l) in groundwater beneath the project site/BRPA site, and some of the detected concentrations exceed the Secondary (aesthetic) MCL for manganese in drinking water (50 µg/l). Manganese was detected in groundwater at relatively high concentrations beneath the Old Davis Landfill, and such concentrations could be attributable to former landfill operations.

4.8.3 REGULATORY CONTEXT

A number of federal, State, and local policies provide the regulatory framework that guides the protection of water resources. The following discussion summarizes those laws that are most relevant to hydrology and water quality in the vicinity of the project site.

Federal Regulations

The following are the federal environmental laws and policies relevant to hydrology and water quality.

Federal Emergency Management Agency

FEMA is responsible for determining flood elevations and floodplain boundaries based on U.S. Army Corps of Engineers (USACE) studies. FEMA is also responsible for distributing the FIRMs, which are used in the NFIP. The FIRMs identify the locations of special flood hazard areas, including the 100-year floodplains.

FEMA allows non-residential development in the floodplain; however, construction activities are restricted within flood hazard areas, depending upon the potential for flooding within each area. Federal regulations governing development in a floodplain are set forth in Title 44, Part 60 of the Code of Federal Regulations (CFR). These standards are implemented at the State level through construction codes and local ordinances; however, these regulations only apply to residential and non-residential structure improvements. Although roadway construction or modification is not explicitly addressed in the FEMA regulations, the California Department of Transportation (Caltrans) has also adopted criteria and standards for roadway drainage systems and projects situated within designated floodplains. Standards that apply to floodplain issues are based on federal regulations (Title 23, Part 650 of the CFR). At the State level, roadway design must comply with drainage standards included in Chapters 800-890 of the Caltrans Highway Design Manual. CFR Section 60.3(c)(10) restricts cumulative development from increasing the water surface elevation of the base flood by more than one foot within the floodplain.

Federal Clean Water Act

The National Pollutant Discharge Elimination System (NPDES) permit system was established in the federal Clean Water Act (CWA) to regulate municipal and industrial discharges to surface waters of the U.S. Each NPDES permit contains limits on allowable concentrations and mass

emissions of pollutants contained in the discharge. Sections 401 and 402 of the CWA contain general requirements regarding NPDES permits. Section 307 of the CWA describes the factors that the USEPA must consider in setting effluent limits for priority pollutants.

Nonpoint sources are diffuse and originate over a wide area rather than from a definable point. Nonpoint pollution often enters receiving water in the form of surface runoff, but is not conveyed by way of pipelines or discrete conveyances. As defined in the federal regulations, such nonpoint sources are generally exempt from federal NPDES permit program requirements. However, two types of nonpoint source discharges are controlled by the NPDES program – nonpoint source discharge caused by general construction activities, and the general quality of stormwater in municipal stormwater systems. The 1987 amendments to the CWA directed the USEPA to implement the stormwater program in two phases. Phase I addressed discharges from large (population 250,000 or above) and medium (population 100,000 to 250,000) municipalities and certain industrial activities. Phase II addresses all other discharges defined by USEPA that are not included in Phase I.

Section 402 of the CWA mandates that certain types of construction activities comply with the requirements of the NPDES stormwater program. The Phase II Rule, issued in 1999, requires that construction activities that disturb land equal to or greater than one acre require permitting under the NPDES program. In California, permitting occurs under the General Permit for Stormwater Discharges Associated with Construction Activity, issued to the State Water Resources Control Board (SWRCB), implemented and enforced by the nine Regional Water Quality Control Boards (RWQCBs).

As of July 1, 2010, all dischargers with projects that include clearing, grading or stockpiling activities expected to disturb one or more acres of soil are required to obtain compliance under the NPDES Construction General Permit Order 2009-0009-DWQ. The General Permit requires all dischargers, where construction activity disturbs one or more acres, to take the following measures:

1. Develop and implement a Stormwater Pollution Prevention Plan (SWPPP) to include a site map(s) of existing and proposed building and roadway footprints, drainage patterns and stormwater collection and discharge points, and pre- and post- project topography;
2. Describe types and placement of Best Management Practices (BMPs) in the SWPPP that will be used to protect stormwater quality;
3. Provide a visual and chemical (if non-visible pollutants are expected) monitoring program for implementation upon BMP failure; and
4. Provide a sediment monitoring plan if the area discharges directly to a water body listed on the 303(d) list for sediment.

To obtain coverage, a SWPPP must be submitted to the RWQCB electronically and a copy of the SWPPP must be submitted to the City of Davis. When project construction is completed, the landowner must file a Notice of Termination (NOT).

State Regulations

The following are the State environmental laws and policies relevant to hydrology and water quality.

State Water Resources Control Board

The SWRCB and the RWQCBs are responsible for ensuring implementation and compliance with the provisions of the federal CWA and California's Porter-Cologne Water Quality Control Act. The project site is situated within the jurisdictional boundaries of the Central Valley RWQCB (CVRWQCB) (Region 5). The CVRWQCB has the authority to implement water quality protection standards through the issuance of permits for discharges to waters at locations within their jurisdiction.

Central Valley Regional Water Quality Control Board

As authorized by the Porter-Cologne Water Quality Control Act, the CVRWQCB's primary function is to protect the quality of the waters within its jurisdiction for all beneficial uses. State law defines beneficial uses of California's waters that may be protected against quality degradation to include, but not be limited to: 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.

The CVRWQCB implements water quality protection measures by formulating and adopting water quality control plans (referred to as basin plans, as discussed below) for specific groundwater and surface water basins, and by prescribing and enforcing requirements on all agricultural, domestic, and industrial waste discharges. The CVRWQCB oversees many programs to support and provide benefit to water quality, including the following major programs: Agricultural Regulatory; Above-Ground Tanks; Basin Planning; CALFED; Confined Animal Facilities; Landfills and Mining; Non-Point Source; Spills, Leaks, Investigations, and Cleanups (SLIC); Stormwater; Total Maximum Daily Load (TMDL); Underground Storage Tanks (UST), Wastewater Discharges (including the NPDES); Water Quality Certification; and Watershed Management.

The CVRWQCB is responsible for issuing permits for a number of varying activities. Activities subject to the CVRWQCB permitting requirements include stormwater, wastewater, and industrial water discharge, disturbance of wetlands, and dewatering. Permits issued and/or enforced by the CVRWQCB include, but are not limited to, the NPDES Construction General Permit, NPDES Municipal Stormwater Permits, Industrial Stormwater General Permits, Clean Water Act Section 401 and 404 Permits, and Dewatering Permits.

Basin Plans and Water Quality Objectives

The Porter-Cologne Water Quality Control Act provides for the development and periodic review of water quality control plans (basin plans) that are prepared by the RWQCBs. Basin plans designate beneficial uses of California's major rivers and groundwater basins, and establish narrative and numerical water quality objectives for those waters. Beneficial uses represent the services and qualities of a water body (i.e., the reasons why the water body is considered valuable), while water quality objectives represent the standards necessary to protect and support those beneficial uses. Basin plans are primarily implemented through the NPDES permitting system and by issuing waste discharge regulations to ensure that water quality objectives are met.

Basin plans provide the technical basis for determining waste discharge requirements and taking regulatory enforcement actions if deemed necessary. The project site is located within the jurisdiction of the CVRWQCB. The City of Davis is located within the plan area of the Water

Quality Control Plan for the Sacramento River Basin and the San Joaquin River Basin (Basin Plan).[13]

The Basin Plan sets water quality objectives for the surface waters in its region for the following substances and parameters: bacteria, bioaccumulation, biostimulatory substances, color, dissolved oxygen, floating material, oil and grease, population and community ecology, pH, radioactivity, salinity, sediment, settleable material, suspended material, sulfide, taste and odor, temperature, toxicity, turbidity, and un-ionized ammonia. For groundwater, water quality objectives applicable to all groundwater have been set for bacteria, chemical constituents, radioactivity, taste, odors, and toxicity.

Senate Bill 5

In 2007, the State of California set the 200-year storm event as the Urban Level of Flood Protection (ULOP) for the State through a series of laws included in Senate Bill (SB) 5. Along with other related legislation, SB 5 established a mandate for local governments to amend their general plans and zoning codes to be consistent with State law on floodplain management. Specifically, SB 5 requires all cities and counties within the Sacramento-San Joaquin Valley, as defined in California Government Code Sections 65007(h) and (j), to make findings related to an ULOP or the national FEMA standard of flood protection before: (1) entering into a development agreement for any property that is located within a flood hazard zone; (2) approving a discretionary permit or other discretionary entitlement, or a ministerial permit that would result in the construction of a new residence, for a project that is located within a flood hazard zone; or (3) approving a tentative map, or a parcel map for which a tentative map was not required, for any subdivision that is located within a flood hazard zone. The primary purpose of the law is to ensure that appropriate flood protection is provided in urban and urbanizing areas.

A project would be subject to the requirements of SB 5 if the project would meet all of the following five criteria:

1. Located within an urban area that is a developed area, as defined by CFR Title 44, Section 59.1, with 10,000 residents or more, or an urbanizing area that is a developed area or an area outside a developed area that is planned or anticipated to have 10,000 residents or more within the next 10 years.
2. Located within a flood hazard zone that is mapped as either a special hazard area or an area of moderate hazard on FEMA's official (i.e., effective) FIRM for the NFIP.
3. Located within the Sacramento-San Joaquin Valley.
4. Located within an area with a potential flood depth above 3.0 feet, from sources of flooding other than localized conditions that may occur anywhere in a community, such as localized rainfall, water from stormwater and drainage problems, and water from temporary water and wastewater distribution system failure.
5. Located within a watershed with a contributing area of more than 10 square miles.

With respect to Criteria 1, the project site/BRPA site is considered to be within an urban area. With respect to Criteria 2, according to the Drainage Report, the northern portion of the site is located within Zone A, and is also located within the Sacramento Valley, consistent with Criteria 3. With respect to Criteria 4, portions of the site are located within an area with a potential flood

[13] Central Valley Regional Water Quality Control Board. *The Water Quality Control Plan for the Sacramento River Basin and the San Joaquin River Basin.* Revised February 2019.

depth above three feet from sources of flooding other than localized conditions. Finally, consistent with Criteria 5, the site is located within the Covell Drain watershed, which has a contributing area of more than 10 square miles.

Because the project would meet all of the foregoing criteria, the Proposed Project/BRPA would be subject to the requirements of SB 5.

The ULOP requires the development to withstand flooding that has a 1-in-200 chance of occurring in any given year. As a result, the project flood evaluation utilizes the 200-year 10-day storm for evaluation of all flood impacts related to the project. Even though the City of Davis requires elevation of the pads one foot above the Base Flood Elevation (BFE), final grades for the project would be based upon the elevations resulting from the 2D Hydraulic Modeling contained herein, which is based on the 200-year recurrence interval storm.

Local Regulations

The following are the local environmental laws and policies relevant to hydrology and water quality.

City of Davis General Plan

The following policies from the City of Davis General Plan related to hydrology and water quality are applicable to the Proposed Project/BRPA:

Water Element

Goal WATER 2 Ensure sufficient supply of high quality water for the Davis Planning Area.

- Policy WATER 2.1 Provide for the current and long-range water needs of the Davis Planning Area, and for protection of the quality and quantity of groundwater resources.
- Policy WATER 2.2 Manage groundwater resources so as to preserve both quantity and quality.
- Policy WATER 2.3 Maintain surface water quality.

Goal WATER 3 Design stormwater drainage and detention facilities to maximize recreational, habitat and aesthetic benefits.

- Policy WATER 3.1 Coordinate and integrate development of storm ponds and channels City-wide, to maximize recreational, habitat and aesthetic benefits.
- Policy WATER 3.2 Coordinate and integrate design, construction, and operation of proposed stormwater retention and detention facilities City-wide, to minimize flood damage potential and improve water quality.

Hazards Element

Goal HAZ 1 Provide flood protection which minimizes potential damage, while enhancing recreational opportunities and wildlife habitats and water quality.

Policy HAZ 1.1	Site and design developments to prevent flood damage.
Policy HAZ 1.2	Continue to provide flood control improvements that are sensitive to wildlife habitat and open space preservation.

NPDES Small Municipal Separate Storm Sewer System (MS4) General Permit

The NPDES Municipal Stormwater Permitting Program regulates stormwater discharges from separate storm sewer systems. NPDES Municipal Stormwater Permits are issued in two phases. Phase I regulates stormwater discharges from large- and medium-sized municipal separate storm sewer systems (those serving more than 100,000 persons). Most Phase I permits are issued to a group of co-permittees encompassing an entire metropolitan area. Phase II provides coverage for smaller municipalities, including nontraditional small storm sewer systems, which include governmental facilities such as military bases, public campuses, and prison and hospital complexes. The NPDES Municipal Stormwater Permits require the discharger to develop and implement a Stormwater Management Plan/Program with the goal of reducing the discharge of pollutants to the maximum extent practicable.

The CVRWQCB issued the NPDES General Permit No. CAS000004 Waste Discharge Requirements for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems, which became effective on July 1, 2013. An "MS4" is a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): (i) designed or used for collecting or conveying stormwater; (ii) which is not a combined sewer; and (iii) which is not part of a Publicly Owned Treatment Works (POTW). The City of Davis is a Phase II MS4 permittee. Projects subject to the requirements of the Phase II MS4 NPDES permit must submit the appropriate Post-Construction Stormwater Plan based on the project type/development category. Regulated Projects include projects that create or replace 5,000 square feet (sf) or more of impervious surface. Regulated Projects that create and/or replace one or more acres of impervious surface are considered regulated hydromodification management projects. The Proposed Project/BRPA would create more than one acre of impervious area, and, thus, are considered Regulated Hydromodification Management Projects subject to Phase II MS4 NPDES permit post-construction stormwater treatment requirements.

Regulated Projects are required to divide the project area into Drainage Management Areas (DMAs) and implement and direct water to appropriately-sized Site Design Measures (SDMs) and Baseline Hydromodification Measures to each DMA to the Maximum Extent Practicable (MEP). Regulated Projects must additionally include Source Control BMPs where possible. SDMs and Baseline Hydromodification Measures include, but are not limited to:

- Rooftop and impervious area disconnection;
- Porous pavement;
- Rain barrels and cisterns;
- Vegetated swales;
- Bio-retention facilities;
- Green roofs; or
- Other equivalent measures.

A detailed description of the requirements for Regulated Hydromodification Management Projects, such as the Proposed Project/BRPA, is included in the *Stormwater Phase II General Permit Development Standards Guidance Document.*[14]

City of Davis Municipal Code

City of Davis Municipal Code Chapter 30, Stormwater Management and Discharge Control, includes ordinances associated with hydrology and water quality. The applicable ordinances are discussed in further detail below.

Section 30.03.010

Section 30.03.010, Stormwater Discharges Associated with Construction Activity, requires compliance with the Construction General Permit. Additionally, an erosion and sediment control plan shall be prepared prior to and as a condition of the issuance of a grading or building permit. The erosion and sediment control plan shall contain, at a minimum, appropriate site-specific construction site BMPs and the rationale used for selecting or rejecting BMPs. Plan review by City staff would ensure compliance with this section and BMPs may be imposed as conditions of approval for a grading or building permit. A SWPPP developed pursuant to the Construction General Permit may substitute for the erosion and sediment control plan for projects where a SWPPP is developed.

Section 30.03.030

Section 30.03.030, New Development and Significant Redevelopment Projects subject to State of California NPDES Phase II Small Municipal Separate Storm Sewer System General Permit, states that all discretionary development and redevelopment projects are subject to the post-construction standards described in the NPDES General Permit for Phase II Small Municipal Separate Storm Sewer System (NPDES General Permit No. CASS000004).

Article 39.05

Article 39.05, Groundwater Wells, is intended to provide standards for the location, construction, maintenance, rehabilitation, sealing, abandonment and destruction of all wells so the quality of the groundwater is not polluted, contaminated or otherwise impacted in a manner which will jeopardize the health, safety or welfare of the citizens of the City. Article 39.05 provides standards for the location, construction, maintenance, rehabilitation, sealing, abandonment, and destruction of all wells.

4.8.4 IMPACTS AND MITIGATION MEASURES

This section describes the standards of significance and methodology used to analyze and determine the Proposed Project's/BRPA's potential impacts related to hydrology and water quality. In addition, a discussion of the project's impacts, as well as mitigation measures where necessary, is also presented.

Standards of Significance

Consistent with Appendix G of the CEQA Guidelines, a significant impact would occur if the Proposed Project/BRPA would result in any of the following:

[14] City of Davis. *Stormwater Phase II General Permit Development Standards Guidance Document*. November 2015.

- Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality;
- Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:
    - Result in substantial erosion or siltation on- or off-site;
    - Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;
    - Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff either during construction or in the post-construction condition; or
    - Impede or redirect flood flows;
- Place housing or improvements within a 100-year flood hazard area either as mapped on a federal Flood Hazard boundary or Flood Insurance Rate Map or other flood hazard delineation map which would:
    - Impede or redirect flood flows;
    - Expose people or structures to risk of loss, injury or death involving flooding; or
    - risk release of pollutants due to project inundation; and/or
- Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

The Proposed Project's/BRPA's impacts associated with erosion or siltation on- or off-site are discussed in Chapter 4.6, Geology and Soils, of this EIR. In addition, water supply availability is addressed in Chapter 4.14, Utilities and Service Systems, of this EIR.

Method of Analysis

The impact analysis for this chapter is based primarily on the Drainage Reports prepared for the Proposed Project and the BRPA by Cunningham Engineering, as well as Hydraulic Modeling conducted by Rick Engineering.

Hydraulic Modeling

Whereas Cunningham Engineering prepared the local hydrology analysis for the Proposed Project and BRPA (see below), Rick Engineering conducted a comparative analysis of the volumetric impacts that could result from the Proposed Project and BRPA, downstream of the project site/BRPA site.

The Hydraulic Modeling analyzed four storm events: the 200-year, 10-day storm; the 100-year, 10-day storm; the 100-year, 24-hour storm; and the 10-year, 24-hour storm. The flow information used for the modeling was taken from a study prepared for the Cannery project adjacent to the project site/BRPA site and provided to Rick Engineering by the City of Davis. The proposed site grading was utilized for the proposed condition models.

The Rick Engineering HEC-1 model does not include any diversion of flow through the levee at Willow Slough that exists in actual conditions. Flap gates on the structure allow flow from the Davis side of the levee to flow into Willow Slough, but do not allow flow from Willow Slough to

flow out of the levee. The model essentially assumes that the stage in Willow Slough is high enough that the flap gates are closed such that all flow within the City side of the levee will pond at the eastern side of Davis instead of flowing into the slough.

Detailed calculations are provided in the Hydraulic Modeling prepared for the Proposed Project and BRPA by Rick Engineering (see Appendix M and Appendix N).

Drainage System and Flood Control Analysis

The Drainage Reports evaluated the preliminary design of the proposed drainage system in accordance with the Phase II General Permit Development Standards Guidance Document[15] and the City of Davis Public Works Revised Design Standards.[16]

The Drainage Reports evaluated whether the Proposed Project/BRPA storm water infrastructure would be designed to address the following design parameters and requirements:

- Storm Water Quality (SWQ) and Low Impact Development (LID) integration into the Proposed Project/BRPA for two-year 24-hour storm;
- On-site conveyance of the 10-year 24-hour storm event and attenuation of the post-project peak flows from the 10-year 24-hour storm event to pre-project peak flows;
- On-site routing of the 100-year 24-hour storm event;
- Protect the proposed development areas from flood water flows and elevate structures above the flood plain; and
- Mitigate development impacts to the flood water flows and flood water elevations to match existing conditions at the project site/BRPA site boundary.

Project Impacts and Mitigation Measures

The following discussion of impacts is based on the implementation of the Proposed Project/BRPA in comparison with the standards of significance identified above.

4.8-1 Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality during construction. Based on the analysis below and with implementation of mitigation, the impact is *less than significant*.

Given that development of both the Proposed Project and the BRPA would result in the construction of similar land uses within the same site, the following discussion applies to the potential for both development scenarios to violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality during construction.

[15] City of Davis. *City of Davis Stormwater Phase II General Permit Development Standards Guidance Document*. November 2015.
[16] City of Davis. *City of Davis Public Works Revised Design Standards*. September 19, 1991.

Proposed Project, Biological Resources Preservation Alternative

Construction of the Proposed Project/BRPA would include grading, excavation, trenching for utilities, and other construction-related activities that could cause soil erosion at an accelerated rate during storm events. In addition, soil would be disturbed during construction of the proposed off-site improvements, including a new roundabout and signals along Pole Line Road, a new traffic signal at the intersection of East Covell Boulevard and L Street, and off-site water line improvements within three existing roadways in the project vicinity. This EIR also covers the potential environmental affects that could result from future construction of grade-separated pedestrian/bicycle crossings at F Street and Pole Line Road. All such activities have the potential to affect water quality and contribute to localized violations of water quality standards if impacted stormwater runoff from construction activities enters the Covell Drain in the project area, which eventually drains to the Willow Slough Bypass.

Soils exposed by the aforementioned types of construction activities have the potential to affect water quality in two ways: 1) suspended soil particles and sediments transported through runoff; or 2) sediments transported as dust that eventually reach local water bodies. Spills or leaks from heavy equipment and machinery, staging areas, or building sites also have the potential to enter runoff. Typical pollutants include, but are not limited to, petroleum and heavy metals from equipment and products such as paints, solvents, and cleaning agents, which could contain hazardous constituents. Sediment from erosion of graded or excavated surface materials, leaks or spills from equipment, or inadvertent releases of building products could result in water quality degradation if runoff containing the sediment or contaminants should enter receiving waters in sufficient quantities. Discharge of polluted stormwater or non-stormwater runoff could violate waste discharge requirements. However, impacts from construction-related activities would generally be short-term and of limited duration.

NPDES permits are required for the discharge of pollutants to waters of the United States, which includes any discharge to surface waters, including lakes, rivers, streams, bays, dry stream beds, wetlands, and storm sewers. The RWQCB issues permits in lieu of direct issuance by the USEPA. The terms of the NPDES permits implement pertinent provisions of the Federal CWA. Section 30.03.010 of City of Davis Municipal Code adopts by reference the standards of the State of California's NPDES Construction General Permit for Stormwater Discharges Associated with Construction Activity (NPDES General Permit No. CAS000002). Because the Proposed Project/BRPA would both require construction activities that would result in a land disturbance of greater than one acre, the project applicant would be required by the State to comply with the most current NPDES Construction General Permit requirements. Pursuant to the requirements, a SWPPP would be prepared for the overall Proposed Project/BRPA, which would include the site map, drainage patterns and stormwater collection and discharge points, BMPs, and a monitoring and reporting framework for implementation of BMPs, as necessary. In addition, a Notice of Intent (NOI) would be filed with RWQCB.

Non-stormwater management and material management controls reduce non-sediment-related pollutants from potentially leaving the construction site to the extent practicable. The Construction General Permit prohibits the discharge of materials

other than stormwater and authorized non-stormwater discharges (such as irrigation and pipe flushing and testing). Non-stormwater BMPs tend to be management practices with the purpose of preventing stormwater from coming into contact with potential pollutants. Examples of non-stormwater BMPs include preventing illicit discharges, and implementing good practices for vehicle and equipment maintenance, cleaning, and fueling operations, such as using drip pans under vehicles. Waste and materials management BMPs include implementing practices and procedures to prevent pollution from materials used on construction sites. Examples of materials management BMPs include the following:

- Good housekeeping activities such as storing of materials covered and elevated off the ground, in a central location;
- Securely locating portable toilets away from the storm drainage system and performing routine maintenance;
- Providing a central location for concrete washout and performing routine maintenance;
- Providing several dumpsters and trash cans throughout the construction site for litter/floatable management; and
- Covering and/or containing stockpiled materials and overall good housekeeping on the site.

While the final materials management BMPs to be used during construction are currently unknown, the Proposed Project/BRPA would likely include a combination of the BMP examples listed above. Final BMPs for the Proposed Project/BRPA construction would be chosen in consultation with the applicable California Stormwater Quality Association (CASQA) Stormwater BMP Handbooks and implemented by the project contractor.

In accordance with the Construction General Permit, the project site/BRPA site would also be inspected during construction before and after storm events and every 24 hours during extended storm events in order to identify maintenance requirements for the implemented BMPs and to determine the effectiveness of the implemented BMPs. As a "living document", the site-specific SWPPP that would be prepared for the Proposed Project/BRPA would be modified as construction activities progress. A Qualified SWPPP Practitioner (QSP) would ensure compliance with the SWPPP through regular monitoring and visual inspections during construction activities. The QSP would amend the SWPPP and revise project BMPs, as determined necessary through field inspections, to protect against substantial erosion or siltation on- or off-site.

Conclusion

Compliance with the State NPDES Construction General Permit would minimize the potential degradation of stormwater quality and downstream surface water associated with construction of the Proposed Project/BRPA. In addition, BMPs would be required to be designed in accordance with the CASQA Stormwater BMP Handbook for New Development and Redevelopment. However, because a SWPPP has not yet been prepared for the Proposed Project/BRPA, proper compliance with the aforementioned regulations cannot be ensured at this time, and the Proposed Project/BRPA's construction activities could violate water quality standards or waste discharge requirements or

otherwise degrade water quality. Therefore, the Proposed Project/BRPA could result in a ***significant*** impact related to short-term construction-related water quality.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a *less-than-significant* level.

Proposed Project, Biological Resources Preservation Alternative

4.8-1 *Prior to commencement of construction, the applicant shall obtain a NPDES General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit), which pertains to pollution from grading and project construction. Compliance with the Permit requires the project applicant to file a Notice of Intent (NOI) with the State Water Resources Control Board (SWRCB) and prepare a Storm Water Pollution Prevention Plan (SWPPP) prior to ground disturbance. The SWPPP would incorporate Best Management Practices (BMPs) in order to prevent, or reduce to the greatest extent feasible, adverse impacts to water quality from erosion and sedimentation. A copy of the SWPPP including BMP implementation provisions shall be submitted to the City of Davis Public Works – Utilities and Operations Department.*

4.8-2 Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality during operations. Based on the analysis below and with implementation of mitigation, the impact is *less than significant*.

Given that both the Proposed Project and BRPA would result in the development of similar land uses within the same site, the following discussion applies to the potential for both development scenarios to violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality during operations. In addition, the analysis includes evaluation of the proposed off-site improvements.

Proposed Project, Biological Resources Preservation Alternative

Development of the Proposed Project/BRPA would result in the conversion of an undeveloped area to a mixed-use development community, including a total of 1,800 dwelling units; neighborhood services; public, semi-public, and educational uses; associated on-site roadway improvements; utility improvements; and parks, open space, greenbelts, and landscaping. Such new land uses could result in new stormwater pollutants being introduced to the project area. Pollutants associated with the operational phase of the Proposed Project/BRPA could include nutrients, oil and grease, metals, organics, pesticides, bacteria, sediment, trash, and other debris. Nutrients that could be present in post-construction stormwater include nitrogen and phosphorous resulting from fertilizers applied to landscaping. Excess nutrients could affect water quality by promoting excessive and/or a rapid growth of aquatic vegetation, which reduces water clarity and results in oxygen depletion. Pesticides, which are toxic to aquatic organisms and can bioaccumulate in larger species, such

as birds and fish, can potentially enter stormwater after application to landscaped areas within the project site. Oil and grease could enter stormwater from vehicle leaks, traffic, and maintenance activities. Metals could enter stormwater as surfaces corrode, decay, or leach. Clippings associated with landscape maintenance and street litter could be carried into storm drainage systems. Pathogens (from pets, wildlife, and human activities) have the potential to affect downstream water quality.

Development of the Proposed Project/BRPA could also increase polluted non-stormwater runoff (e.g., car wash water, other wash water, and landscape irrigation runoff). Such non-stormwater runoff could flow down sidewalks, parking areas, and streets, and pick up additional pollutants deposited on impervious surfaces prior to discharge into the storm drain system and surface waters. Discharge of polluted stormwater or non-stormwater runoff could violate waste discharge requirements.

In addition, as discussed above in the Existing Setting section, PFAS and manganese concentrations that originate from the Old Davis Landfill have been detected in groundwater beneath the project site/BRPA site. On-site excavation to create the project's storm water system could expose contaminated groundwater.

Phase II MS4 Permit Requirements

As discussed previously, the project site/BRPA site is located within the permit area covered by the City of Davis' MS4 Permit (NPDES General Permit No. CAS000004, Order No. 2013-0001-DWQ), pursuant to the NPDES Phase II program. Project-related stormwater discharges are subject to all applicable requirements of said permit. Specifically, as noted above, regulated projects are required to divide the project area into DMAs and implement and direct water to appropriately-sized SDMs and Baseline Hydromodification Measures to each DMA. Source control measures must be designed for pollutant-generating activities or sources consistent with recommendations from the CASQA Stormwater BMP Handbook for New Development and Redevelopment, or equivalent manual, and must be shown on the Improvement Plans. Additional details related to hydromodification management requirements associated with the Phase II MS4 permit are discussed under Impact 4.8-4 below.

Proposed Storm Drain System

The City of Davis requires all development projects to comply with the Stormwater Phase II General Permit Development Standards Guidance Document.[17] The Proposed Project/BRPA would create more than one acre of impervious surface and would therefore qualify as a regulated project under Section 5 of the design standards. LID measures would be integrated throughout the project site/BRPA site to provide stormwater quality treatment. LID components refer to systems and practices that use or mimic natural processes that result in the infiltration, evapotranspiration or use of stormwater in order to protect water quality and associated aquatic habitat. The LID measures are anticipated to include both volume-based BMPs (e.g., bioretention, infiltration features, pervious pavement, etc.) and flow-based BMPs (e.g., vegetated swales, stormwater planter, etc.). The use of the features would be dependent upon location and setting within the project. The BMPs

[17] City of Davis. *City of Davis Stormwater Phase II General Permit Design Standard Guidance Document*. November 2015.

would be designed in accordance with the stormwater quality control standards established by Davis Municipal Code Article 30.03 and the CASQA – California Stormwater BMP Handbook.

The primary on-site storm water feature that would address both water quality and peak flow attenuation of runoff is the proposed centralized detention basin. As discussed in Chapter 3, Project Description, Channel A would be rerouted from the northwest corner of the project site/BRPA site to convey flows along the northern site boundary to a new centralized stormwater detention basin. From the new detention basin to Pole Line Road, Channel A would be expanded and have a drainage capacity capable of accommodating the existing flows of the tributary to Channel A within Wildhorse. These proposed drainage features are discussed further in Impact 4.8-4 below.

In an effort to ensure that contaminated groundwater associated with the Old Davis Landfill does not enter the proposed storm water system for the Proposed Project/BRPA, Geocon prepared a Channel Evaluation Report to assess the depth at which contaminated groundwater could be encountered on-site during excavation of the drainage system, including channel and detention basin. As previously discussed, and shown in Figure 4.8-3, the substantial majority of groundwater elevation data points are below 26.5 feet amsl. Thus, the Drainage Channel Evaluation prepared for the Proposed Project/BRPA by Geocon recommended the proposed drainage channel be designed with a base elevation above the groundwater elevation (i.e., 26.5 feet amsl) to limit the infiltration of groundwater into the channel that may be impacted by PFAS or manganese. As such, Cunningham Engineering designed the drainage channel and detention basin to comply with the recommended elevation to ensure that contaminated groundwater is not infiltrated into the channel and does not impact the water quality of off-site flows. The proposed channel/detention basin base elevations of 26.5 feet amsl are consistent with the existing Channel A elevation and the existing Cannery basin elevations, both of which have been reported by the City not to have standing ground water at any time during winter months.[18] Therefore, substantial evidence exists to conclude that potentially contaminated groundwater from the Old Davis Landfill would not come into contact with the Proposed Project/BRPA storm water system. As a result, substantial exists to support the conclusion that the project's runoff would not transport contaminated water into the downstream system.

Maintenance and Inspection

In order to ensure continued operation of the proposed LID control features, there would be regular inspection and maintenance of such features. For example, plants and vegetation within the detention basins would be inspected monthly, and the basins would be inspected for the presence of standing water 72 hours after rain events. Maintenance activity would include, but not necessarily be limited to, removal of debris from basins and removal of debris from outlets of basins. In addition, any method of trash capture would require frequent monitoring and cleaning to keep the pump station fully operational.

[18] Geocon Consultants, Inc. *Drainage Channel Evaluation, Village Farms Davis, Davis, California* [page 9]. July 2024.

Conclusion

Based on the above, the Proposed Project/BRPA would include site design measures to ensure that stormwater runoff is properly treated prior to discharge. Thus, urban pollutants entering and potentially degrading local water quality would not be expected to occur as a result of the Proposed Project/BRPA. However, because a final Stormwater Control Plan has not been prepared, ongoing maintenance of the proposed stormwater treatment system and incorporation of proper source-control measures cannot be ensured at this time. Thus, project operation could violate water quality standards or waste discharge requirements or otherwise degrade water quality, and a ***significant*** impact could occur.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a *less-than-significant* level.

Proposed Project, Biological Resources Preservation Alternative

4.8-2 *Prior to approval of final project improvement plans, a final Stormwater Control Plan shall be submitted to City of Davis Public Works – Utilities and Operations Department for review and approval. The final Stormwater Control Plan shall be in compliance with all applicable provisions of the National Pollutant Discharge Elimination System (NPDES) Phase II MS4 General Permit (NPDES General Permit No. CAS612008, Order No. R2-2022-0018) and shall meet the standards of the California Stormwater Quality Association (CASQA) Stormwater BMP Handbook for New Development and Redevelopment. Site design measures, source-control measures, hydromodification management, and Low Impact Development (LID) standards, as necessary, shall be incorporated into the design and shown on the improvement plans. The final plans shall include calculations demonstrating that the water quality BMPs are appropriately sized, using methodology in the CASQA Stormwater BMP Handbook for New Development and Redevelopment. The final plans shall also incorporate the proposed components for maintaining the stormwater-treatment facilities.*

4.8-3 Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin or conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. Based on the analysis below, the impact is *less than significant*.

Given that the Proposed Project and BRPA are located within the same groundwater subbasin and would be provided water from the same source, the following discussion applies to the potential for both development scenarios to substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that the Proposed Project/BRPA may impede sustainable groundwater management of the

basin or conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

Proposed Project, Biological Resources Preservation Alternative

The Proposed Project/BRPA would result in an increase in on-site impervious surfaces, which would reduce the infiltration of groundwater as compared to existing conditions. Groundwater relies on annual rainfall and percolation through pervious soils to recharge the system. As discussed above, however, soils throughout the project area have very slow infiltration rates with high runoff potential during storm events. Thus, the project site/BRPA site would not be considered an area of substantial contribution to groundwater recharge in the region. Given the limited recharge potential of the portions of the site that would be developed with impervious surfaces, the Proposed Project/BRPA would not interfere substantially with groundwater recharge. Furthermore, both the Proposed Project and the BRPA would include a new stormwater detention basin and open channel, which would be located between the North and East Villages. The detention basin and associated open channel would allow partial infiltration of runoff into on-site soils.

In addition, while the City pumps groundwater supplies from the Yolo Subbasin, the groundwater subbasin is not currently in a state of overdraft, and as further discussed in Chapter 4.14, Utilities and Service Systems, of this EIR, the City's projected available annual potable surface water supplies would be sufficient to serve the demands of the City's existing water service plus the Proposed Project/BRPA.

Considering that the project site/BRPA site is not considered an important groundwater recharge area and that the Proposed Project/BRPA would not involve increased demand on groundwater supplies within an area in a state of overdraft, the Proposed Project/BRPA would not create a conflict with, or impede the implementation of, a sustainable groundwater plan. Thus, impacts related to groundwater would be ***less than significant***.

Mitigation Measure(s)

None required.

4.8-4 Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site; or create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. Based on the analysis below, and with implementation of mitigation, the impact is *less than significant*.

The following discussions include an analysis of the potential for both the Proposed Project and the BRPA to substantially alter the drainage pattern of the site or area, or increase the rate or amount of surface runoff within the project area.

The potential for the Proposed Project or the BRPA to result in substantial additional sources of polluted runoff, including erosion, is addressed under Impacts 4.8-1 and 4.8-2 above. Further discussion regarding erosion is provided in Chapter 4.6, Geology and Soils, of this EIR.

Proposed Project

The following section includes a discussion of peak stormwater flows associated with the Proposed Project and the downstream volumetrics of the stormwater system under existing conditions and Proposed Project conditions.

Peak Flows

The only impervious surfaces that currently exist within the project site are those related to a private access road, L Street, as well as the impervious surfaces associated with the one existing agricultural structure. Implementation of the Proposed Project would result in a substantial increase in the amount of impervious surfaces related to roofs, driveways, and roadways. Increases to peak runoff rates resulting from alterations to the existing drainage pattern of the site have the potential to result in exceedance of existing or planned stormwater drainage systems or flooding on- or off-site.

The proposed drainage patterns would largely follow the overall existing west-to-east trend, with major internal pipeline conveyances routed along the new street corridors. The proposed surface improvements would result in impervious ground cover ranging from 10 percent impervious in parks and greenbelt areas to 90 percent impervious in residential areas. The Proposed Project would result in a total of approximately 53 percent new impervious surfaces within the project site. The estimate of new impervious surfaces excludes the depressed agricultural buffer at the north edge of the project site. The agricultural buffer area would remain pervious and is not a part of the proposed drainage sheds.

Based on the proposed land use plan and preliminary mass grading design, the Proposed Project sub-sheds would direct surface runoff to the internal major drainage conveyances (see Figure 4.8-4). The main drainage conveyance piping would carry runoff from the developed areas to the new detention basin, which would outlet to the reconstructed Channel A and into the Wildhorse Channel. The major storm drain pipes would generally be routed within the backbone roadway corridors. Final sizing of the pipes would be detailed later during the subdivision mapping and improvement plan design phases of the Proposed Project.

The primary inflow to the project site is from the Covell Drain (Flow #1 as shown on Figure 4.8-2), which would remain unchanged with the Proposed Project improvements; entering the project site at the northwest corner through dual box culverts at F Street and the UPRR tracks. Flows entering the project site from the F Street Channel (Flow #6 as shown on Figure 4.8-2) and Northstar Pond Discharge

(Flow #5 as shown on Figure 4.8-2) would also remain unchanged at the grade-separated crossing of the UPRR tracks.

Inflow from the trestle crossing would be split and portions rerouted northerly parallel to the UPRR tracks approximately 1,400-feet to the Channel A box culverts, flowing into the rerouted on-site Channel A (see Figure 4.8-4). Inflow from the trestle crossing would also continue directly east through on-site Channel A that will remain in its current alignment (Flow #P3, see Figure 4.8-5). Channel flow from both the re-routed and intact portions of Channel A (Flow P2 and P3, Figure 4.8-5 would flow to the proposed detention basin.

Overflow from the Cannery detention basin would continue to discharge at the existing concrete weir and would be routed through the project site in a new drainage channel within the proposed greenbelt (Flow #P4). Flow from the Cannery would be directed north into Channel A to remain and continue to the proposed detention basin.

Under high flow conditions, stormwater north of the project site from the North Davis Channel currently overwhelms the capacity of the existing channel and spills south into the existing farm field (Flow #7). The North Davis Drain channelized flow (Flow #2) also overwhelms the channel capacity west of F Street, resulting in shallow flooding of the farm fields and ultimately overtopping F Street and the Railroad (Flow #8). Storm water flows from the aforementioned locations continue as shallow overland flow southerly toward the project site. The Proposed Project includes excavation of the northern approximately 118 acres of farmland to be excavated for use as fill soil on-site. Excavations would generally be 10 feet deep targeting an elevation of 28 feet. A berm would be constructed on the northern edge between the North Channel (Flow P1) and the new urban agricultural transition area (UATA), with drains provided to facilitate the flow from the UATA into the northern channel.

The depressed agricultural buffer (Area AB as shown on Figure 4.8-5) is contiguous to the proposed realigned North Channel (Flow #P1) with the weir provided at the top of the berm at an elevation of 31 feet. During smaller storm events (two-year, 24-hour), storm water within the Channel A system would be contained and conveyed within the channelized portion of the project site and directed to the detention basin.

Larger storm events resulting in additional runoff would begin shallow inundation of the depressed agricultural buffer during the storm event and then receding by passive gravity flow after the storm has passed. The storage within the depressed agricultural buffer would result in large reductions downstream of the project, particularly in the flow overtopping Pole Line Road and the ponding in East Davis,[19] which is further discussed below.

[19] Rick Engineering. *Village Farms Project: 2-Dimensional Hydraulic Modeling* [page 11]. Revised July 8, 2024.

Figure 4.8-4
Proposed Project Drainage System

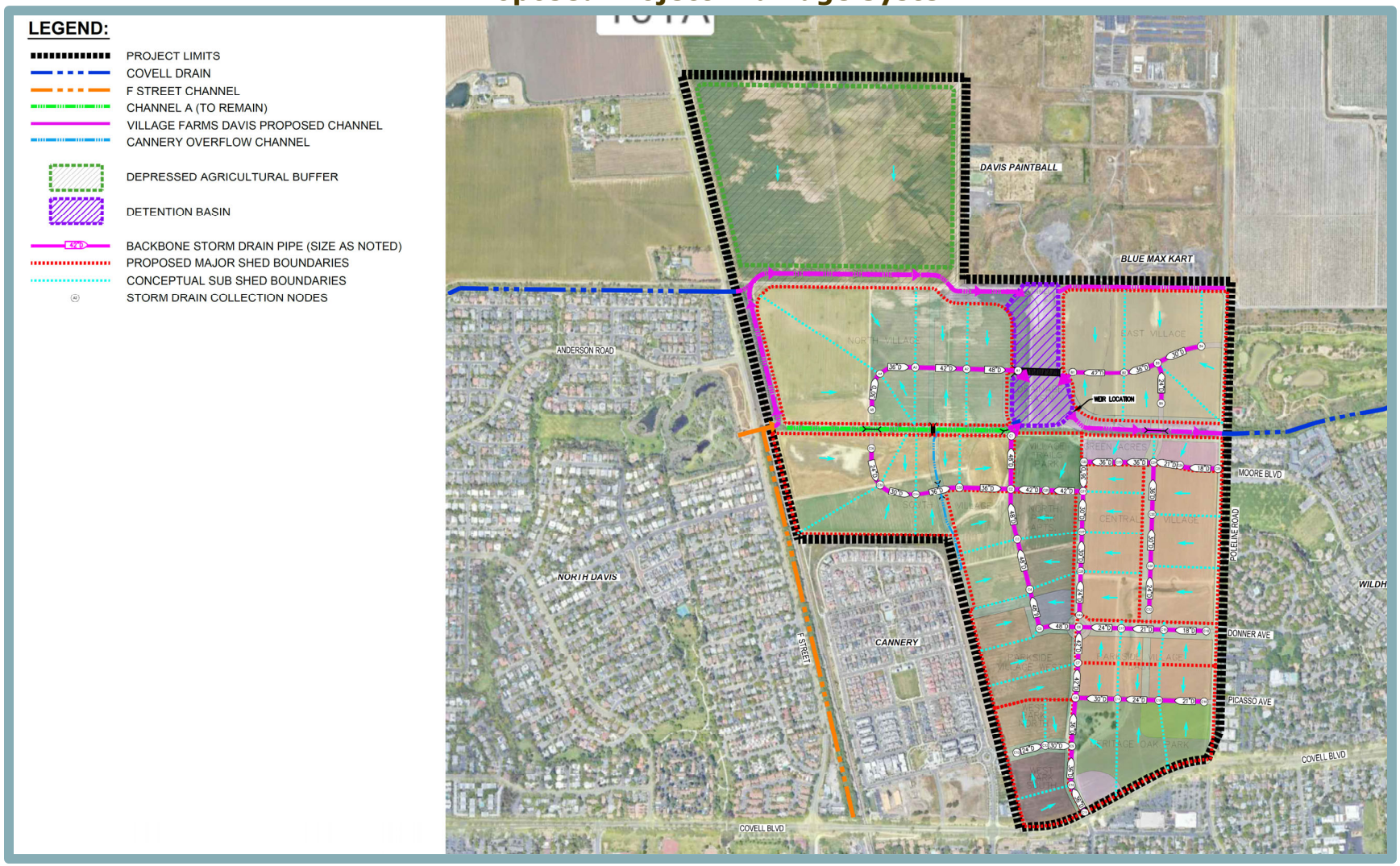
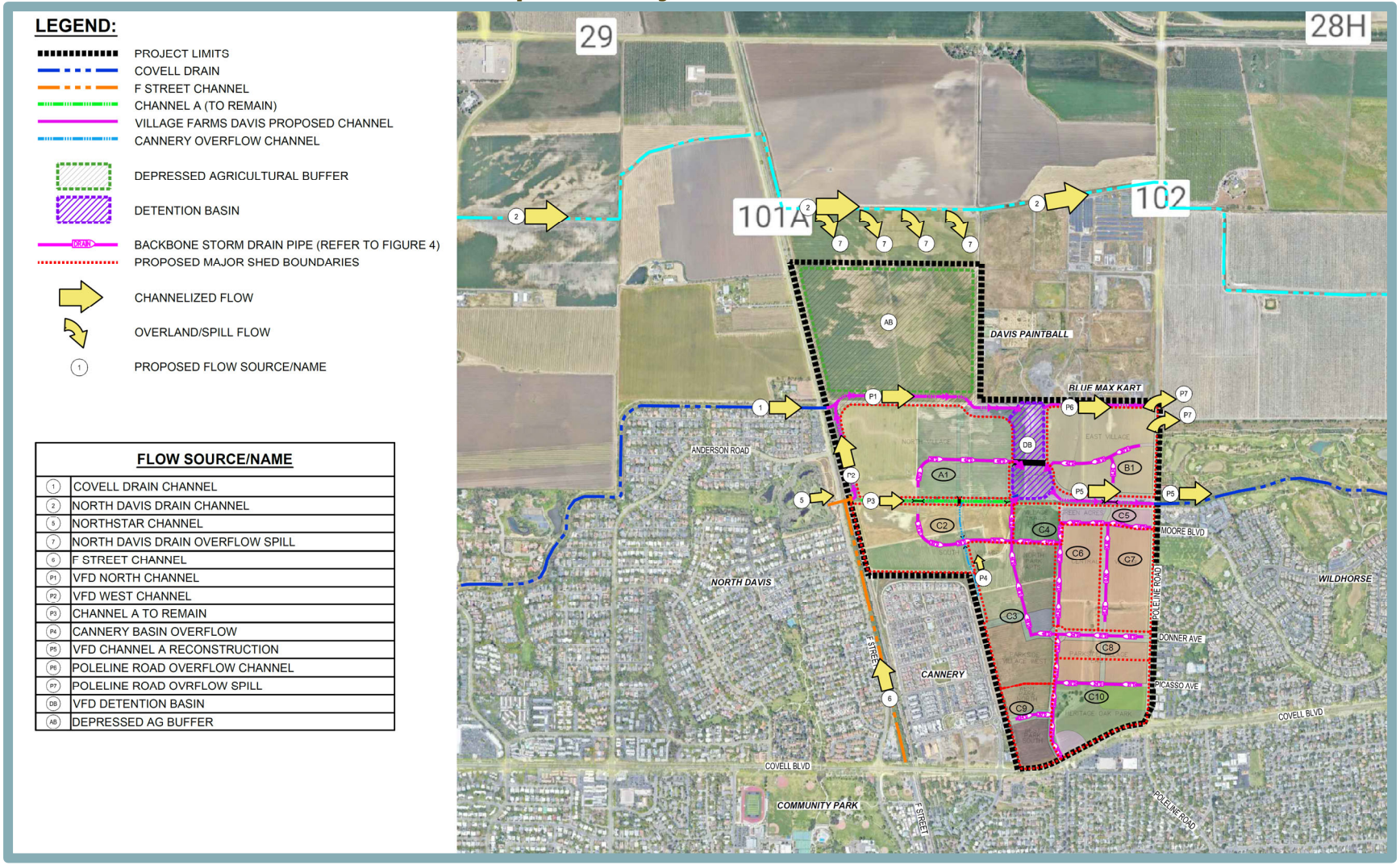


Figure 4.8-5
Proposed Project Stormwater Flow



The proposed detention basin would be located within the north-central region of the project site. The outlet from the detention basin would be located at the southeast corner of the detention basin connecting to the Channel A reconstruction (Flow #P5). Flow would be regulated at the outlet from the detention basin with a weir structure and a low flow pipe.

The Proposed Project would include development of on-site detention to handle the on-site flow volumes and reduce the peak discharges from the site to match existing conditions for both the 10-year, 24 hour storm and the 100-year, 24 hour storm. Furthermore, the 200-year, 10-day storm is addressed through the on-site detention basin, channel system, and the storage that would be provided by the depressed UATA. With the combination of these features, peak discharge from the project site would not exceed existing conditions under the 200-year, 10-day storm event.

Volumetric Analysis

Rick Engineering performed 2-Dimensional Hydraulic Modeling for the Proposed Project to compare downstream volumetrics of the system under existing conditions and Proposed Project conditions for the 200-year, 10-day storm event, 100-year, 10-day storm event, 100-year, 24-hour storm event, and 10-year, 24-hour storm event (discussed further in the Method of Analysis section above).

As shown in Table 4.8-1 and Table 4.8-2, the Proposed Project is anticipated to result in peak flows and water surface elevations upstream and downstream of the project site that are equal to or reduced in the proposed condition. Figure 4.8-6 and Figure 4.8-7 show the locations referenced in the tables. Peak flows and water surface elevations downstream from the project site are anticipated to be similar for larger storm events in the existing and proposed condition.

However, the Proposed Project is anticipated to result in significantly reduced peak flows and water surface elevations in the smaller, more frequent storm events.

In general, the Proposed Project would result in equal to or reduced water surface elevations outside of the project site, with some areas in the undeveloped farmland showing small increases. Generally, the increases are less than 0.05-foot with the majority of increases being 0.01-foot or less. The 100-year, 24-hour storm event does show some isolated areas with larger increases that would occur within drainage features along Covell Drain in the Wildhorse golf course. The largest increase shown is approximately 0.4-foot to 0.5-foot, directly over the pond in the northeast corner of the golf course, which would not impact structures.

Table 4.8-1
Proposed Project Hydraulic Modeling Results: Upstream

Storm Event	Condition	Upstream Boundary Conditions					
		Covell Drain		H Street Channel		North Davis Drain	
		Peak Flow (cfs)	Peak Stage (ft)	Peak Flow (cfs)	Peak Stage (ft)	Peak Flow (cfs)	Peak Stage (ft)
200-year, 10-day	Existing	1,326.16	43.23	411.27	41.10	1,950.28	45.12
	Proposed	1,326.16	41.50	411.27	39.08	1,950.28	45.11
100-year, 10-day	Existing	1,317.73	43.21	411.56	41.08	1,950.28	45.12
	Proposed	1,317.73	41.47	411.56	39.06	1,950.28	45.11
100-year, 24-hour	Existing	780.99	41.02	408.30	40.11	785.03	44.81
	Proposed	780.99	39.14	408.30	37.73	785.03	44.81
10-year, 24-hour	Existing	220.56	39.42	441.40	39.55	215.60	44.17
	Proposed	220.56	35.95	441.40	37.86	215.60	44.17

Source: Rick Engineering, Village Farms Project: 2-Dimensional Hydraulic Modeling, July 8, 2024.

Table 4.8-2
Proposed Project Hydraulic Modeling Results: Internal and Downstream

Storm Event	Condition	Internal Points of Interest, Downstream of Proposed Improvements, Conditions			Downstream Boundary Conditions
		Pole Line Culvert at Channel A	Pole Line Overflow	North Davis Drain	Willow Slough
		Peak Flow (cfs)	Peak Flow (cfs)	Peak Flow (cfs)	Peak Flow (cfs)
200-year, 10-day	Existing	647.32	1,202.16	2,759.80	10,024.59
	Proposed	627.97	1,112.20	2,737.66	10,024.59
100-year, 10-day	Existing	641.68	1,126.58	2,728.97	10,024.54
	Proposed	620.81	1,103.53	2,703.09	10,024.54
100-year, 24-hour	Existing	579.05	349.89	726.23	5,693.07
	Proposed	548.68	118.65	639.27	5,693.07
10-year, 24-hour	Existing	488.89	15.81	206.73	3,523.60
	Proposed	298.27	0.66	177.35	3517.71

Source: Rick Engineering, Village Farms Project: 2-Dimensional Hydraulic Modeling, July 8, 2024.

Figure 4.8-6
Upstream Boundaries and Internal Points of Interest

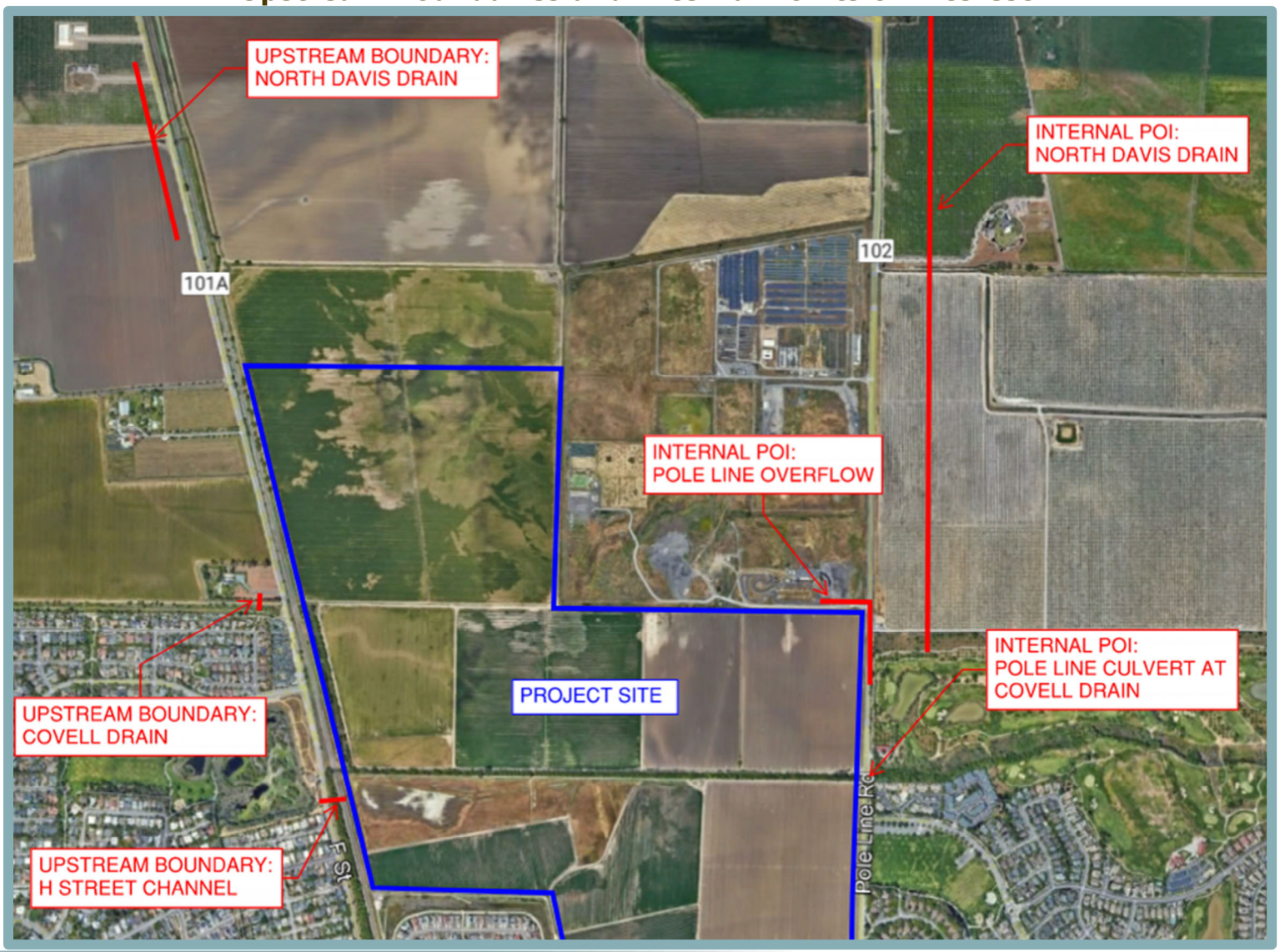
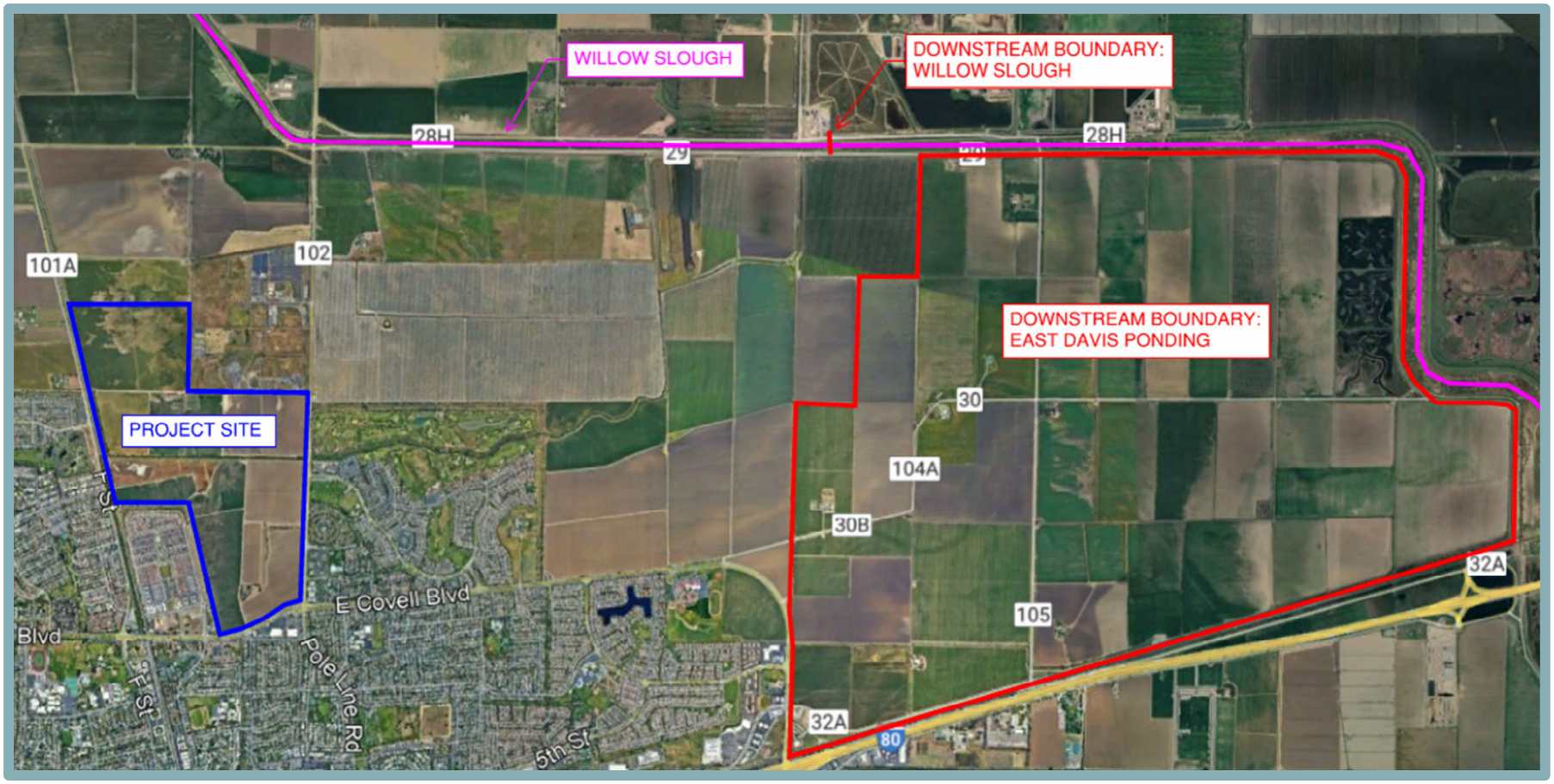


Figure 4.8-7
Downstream Boundaries



East Davis Ponding

As shown in Table 4.8-3, the Proposed Project is anticipated to result in approximately 0.01-foot of increase to water surface elevations in the 100- and 200-year, 10-day storm event. The increase is based on an analysis that is anticipated to be conservative for the combined hydrologic and hydraulic impacts of the Proposed Project. The Proposed Project would result in reductions in ponding depths in smaller, more frequent storm events within the watershed as shown with the net reductions in ponding depths for the 10- and 100-year, 24-hour storm events.

Biological Resources Preservation Alternative

The following section includes a discussion of peak stormwater flows associated with the BRPA and the downstream volumetrics of the stormwater system under existing conditions and BRPA conditions.

Peak Flows

Similar to the Proposed Project, the only impervious surfaces that currently exist within the BRPA site are those related to a private access road, L Street, as well as the impervious surfaces associated with the one existing agricultural structure. Implementation of the BRPA would result in a substantial increase in the amount of impervious surfaces related to roofs, driveways, and roadways. Increases to peak runoff rates resulting from alterations to the existing drainage pattern of the site have the potential to result in exceedance of existing or planned stormwater drainage systems or flooding on- or off-site.

The proposed drainage patterns would largely follow the overall existing west-to-east trend, with major internal pipeline conveyances routed along the new street corridors (see Figure 4.8-8). Similar to the Proposed Project, the BRPA would result in a total of approximately 53 percent new impervious surfaces within the BRPA site. The estimate of new impervious surfaces excludes the depressed agricultural buffer at the north edge of the project site. The agricultural buffer area would remain pervious and is not a part of the proposed drainage sheds.

The BRPA sub-sheds would direct surface runoff to the internal major drainage conveyances (see Figure 4.8-8).

The main drainage conveyance piping would carry runoff from the developed areas to the new detention basin, which would outlet to the reconstructed Channel A and into the Wildhorse Channel. The major storm drain pipes would generally be routed within the backbone roadway corridors. Final sizing of these pipes will be detailed later during the subdivision mapping and improvement plan design phases of the BRPA.

The inflow into the BRPA site would be similar as inflow to the Proposed Project site, as described above (see Figure 4.8-9). In addition, the proposed BRPA detention basin would be the same design as the Proposed Project detention basin, as described above, and the BRPA would include excavation of the northern approximately 118 acres of farmland to a depth of approximately 9-10 feet for use as fill soil on-site.

Table 4.8-3
Proposed Project Net Impacts to East Davis Pond Storage

Storm Event	East Davis Ponding Peak Stage (feet)						
	HEC-1 Hydrologic Analysis			HEC-RAS Hydraulic Analysis			Total Net Impact to East Davis Pond Storage
	Existing	Proposed	Change	Existing	Proposed	Change	
200-year, 10-day	27.29	27.34	0.05	25.34	25.50	-0.04	0.01
100-year, 10-day	27.05	27.10	0.05	25.31	25.27	-0.04	0.01
100-year, 24-hour	20.78	20.84	0.06	19.16	18.79	-0.37	-0.31
10-year, 24-hour	17.91	17.98	0.07	18.28	17.79	-0.49	-0.42

Source: Rick Engineering, Village Farms Project: 2-Dimensional Hydraulic Modeling, July 8, 2024.

Figure 4.8-8
Biological Resources Preservation Alternative Drainage System

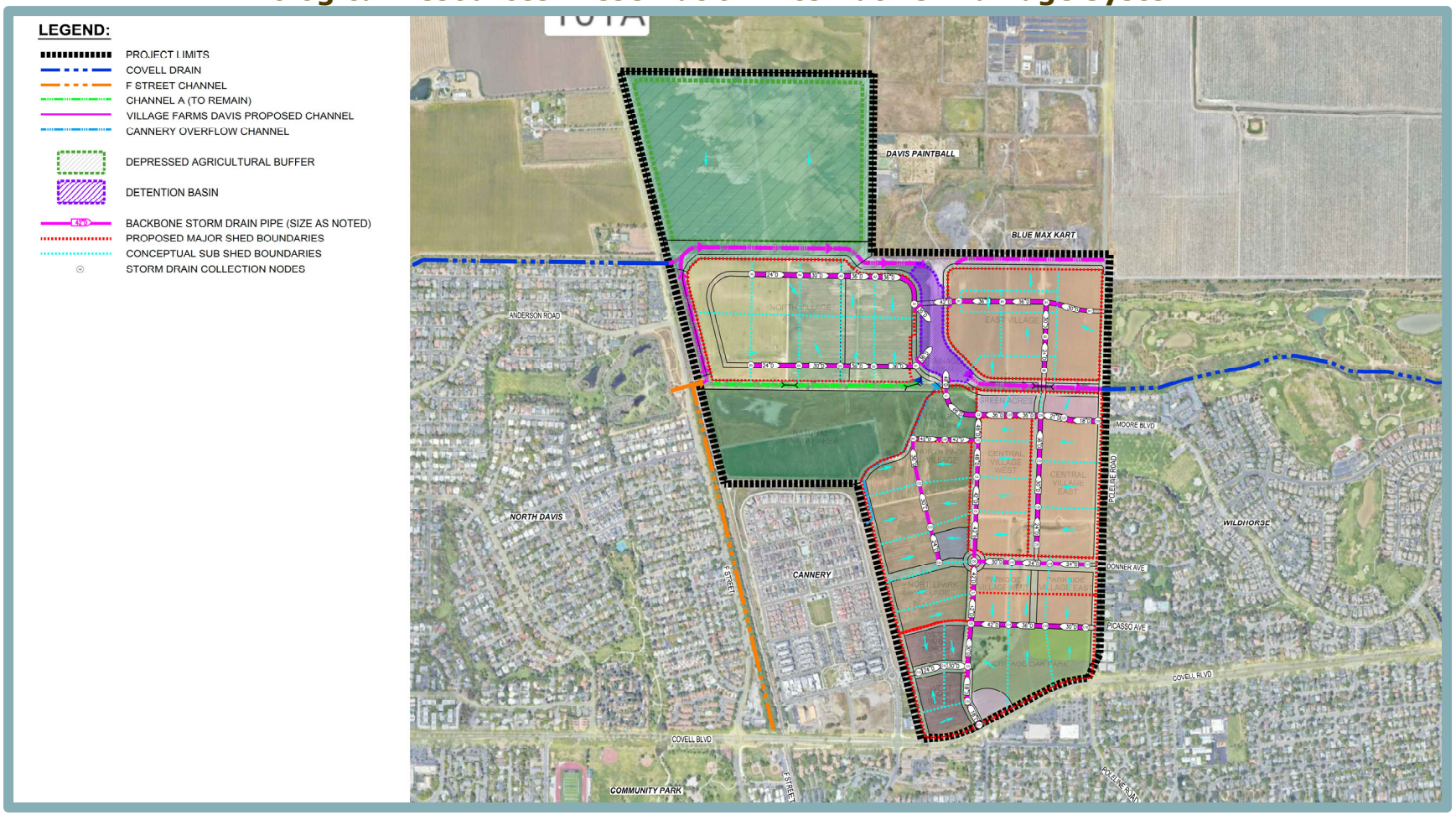
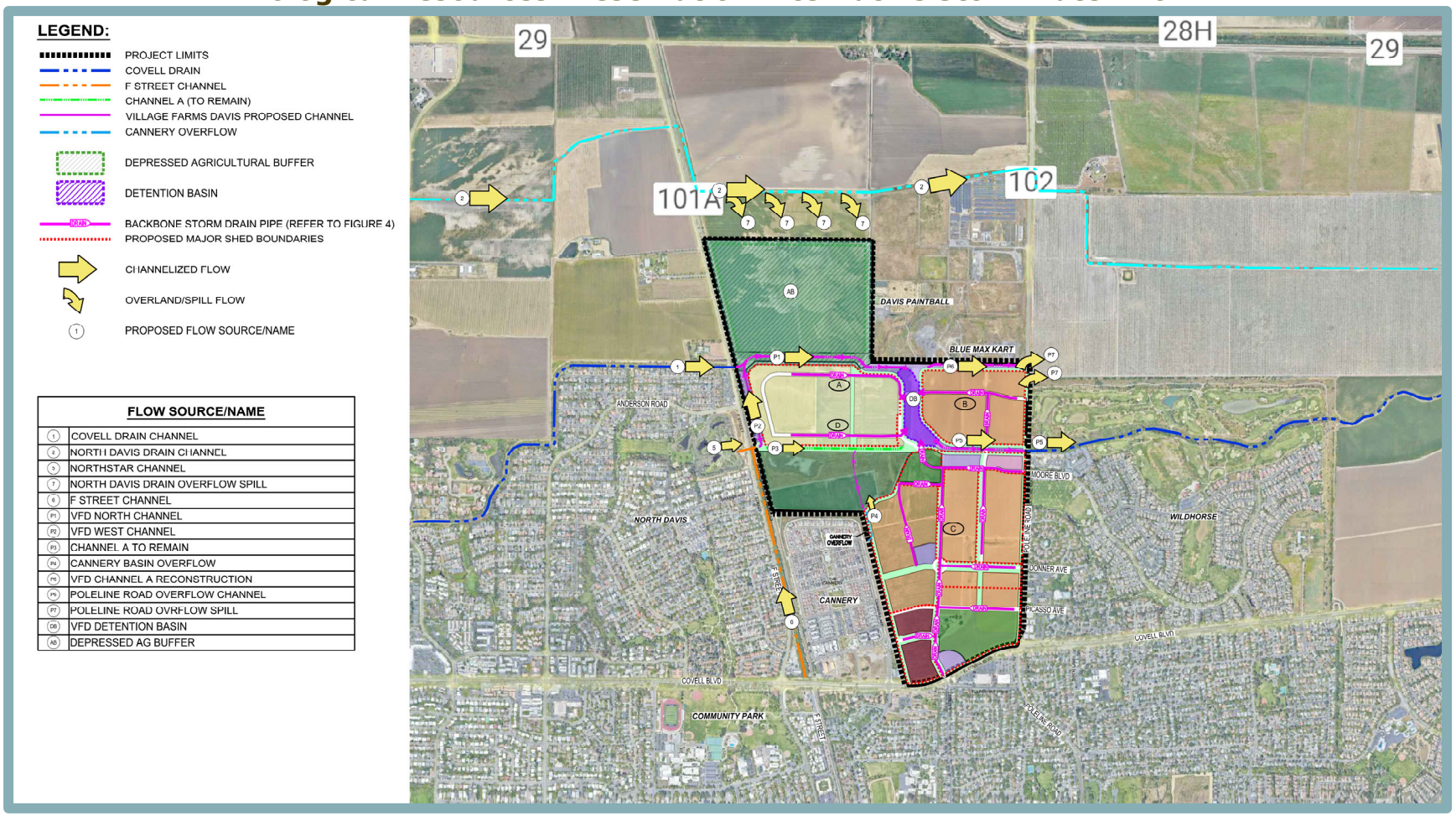


Figure 4.8-9
Biological Resources Preservation Alternative Stormwater Flow



Volumetric Analysis

Similar to the Proposed Project, Rick Engineering conducted 2-Dimensional Hydraulic Modeling for the BRPA under existing and post-project conditions for the 200-year, 10-day storm event, the 100-year, 10-day storm event, the 100-year, 24-hour storm event, and the 10-year, 24-hour storm event using the HEC-RAS 2D hydraulic modeling (discussed further in the Method of Analysis section above).

As shown in Table 4.8-4 and Table 4.8-5, the BRPA is anticipated to result in peak flows and water surface elevations upstream and downstream of the BRPA site that are equal to or reduced in the proposed condition. Figure 4.8-6 and Figure 4.8-7 show the locations referenced in the tables. Peak flows and water surface elevations downstream from the project site are anticipated to be similar for larger storm events in the existing and proposed condition. However, the BRPA is anticipated to result in significantly reduced peak flows and water surface elevations in the smaller, more frequent storm events.

In general, the BRPA would result in equal to or reduced water surface elevations outside of the BRPA site, with some areas in the undeveloped farmland showing small increases. Generally, the increases are less than 0.05-foot with the majority of increases being 0.01-foot or less. The 100-year, 24-hour storm event does show some isolated areas with larger increases that would occur within drainage features along Covell Drain in the Wildhorse golf course. The largest increase shown is approximately 0.4-foot to 0.5-foot, directly over the pond in the northeast corner of the golf course, which would not impact structures.

East Davis Ponding

As shown in Table 4.8-6, the BRPA is anticipated to result in approximately 0.02-foot of increase to water surface elevations in the 100- and 200-year, 10-day storm event. The increase is based on an analysis that is anticipated to be conservative for the combined hydrologic and hydraulic impacts of the BRPA. The BRPA would result in reductions in ponding depths in smaller, more frequent storm events within the watershed as shown with the net reductions in ponding depths for the 10- and 100-year, 24-hour storm events.

Conclusion

Based on the above, the Proposed Project or the BRPA would result in a ***significant*** impact related to substantially altering the drainage pattern of the site or area, or increasing the rate or amount of surface runoff.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce to a *less-than-significant* level the impacts associated with substantially altering the existing drainage pattern of the site or area, creating or contributing runoff water which would exceed the capacity of existing or planned stormwater drainage systems, and substantially increasing the rate or amount of surface runoff in a manner that would result in flooding on- or off-site.

Table 4.8-4
Biological Resources Preservation Alternative Hydraulic Modeling Results: Upstream

Storm Event	Condition	Upstream Boundary Conditions					
		Covell Drain		H Street Channel		North Davis Drain	
		Peak Flow (cfs)	Peak Stage (ft)	Peak Flow (cfs)	Peak Stage (ft)	Peak Flow (cfs)	Peak Stage (ft)
200-year, 10-day	Existing	1,326.16	43.23	411.27	41.10	1,950.28	45.12
	Proposed	1,326.16	41.50	411.27	39.08	1,950.28	45.11
100-year, 10-day	Existing	1,317.73	43.21	411.56	41.08	1,950.28	45.12
	Proposed	1,317.73	41.48	411.56	39.00	1,950.28	45.11
100-year, 24-hour	Existing	780.99	41.02	408.30	40.11	785.03	44.81
	Proposed	780.99	39.20	408.30	37.80	785.03	44.81
10-year, 24-hour	Existing	220.56	39.42	441.40	39.55	215.60	44.17
	Proposed	220.56	35.95	441.40	37.90	215.60	44.18

Source: Rick Engineering, Village Farms Project: 2-Dimensional Hydraulic Modeling, July 8, 2024.

Table 4.8-5
Biological Resources Preservation Alternative Hydraulic Modeling Results: Internal and Downstream

Storm Event	Condition	Internal Points of Interest, Downstream of Proposed Improvements, Conditions			Downstream Boundary Conditions
		Pole Line Culvert at Channel A	Pole Line Overflow	North Davis Drain	Willow Slough
		Peak Flow (cfs)	Peak Flow (cfs)	Peak Flow (cfs)	Peak Flow (cfs)
200-year, 10-day	Existing	647.32	1,202.16	2,759.80	10,024.59
	Proposed	631.95	1,091.12	2,735.71	10,024.59
100-year, 10-day	Existing	641.68	1,126.58	2,728.97	10,024.54
	Proposed	625.40	1,079.67	2,699.20	10,024.54
100-year, 24-hour	Existing	579.05	349.89	726.23	5,693.07
	Proposed	553.69	102.25	623.33	5,693.07
10-year, 24-hour	Existing	488.89	15.81	206.73	3,523.60
	Proposed	299.49	0.80	177.59	3517.75

Source: Rick Engineering, Village Farms Project: 2-Dimensional Hydraulic Modeling, July 8, 2024.

Table 4.8-6
Biological Resources Preservation Alternative
Net Impacts to East Davis Pond Storage

Storm Event	East Davis Ponding Peak Stage (feet)						
	HEC-1 Hydrologic Analysis			HEC-RAS Hydraulic Analysis			Total Net Impact to East Davis Pond Storage
	Existing	Proposed	Change	Existing	Proposed	Change	
200-year, 10-day	27.29	27.34	0.05	25.54	25.51	-0.03	0.02
100-year, 10-day	27.05	27.10	0.05	25.31	25.28	-0.03	0.02
100-year, 24-hour	20.78	20.84	0.06	19.16	18.81	-0.35	-0.29
10-year, 24-hour	17.91	17.98	0.07	18.28	17.82	-0.46	-0.39

Source: Rick Engineering, Village Farms Project: Biological Wetland Avoidance Alternative: 2-Dimensional Hydraulic Modeling, July 8, 2024.

Proposed Project, Biological Resources Preservation Alternative

4.8-4 *In conjunction with submittal of the first tentative subdivision map for the Proposed Project or BRPA, a design-level drainage report shall be submitted to the City of Davis Public Works – Utilities and Operations Department for review and approval. The drainage report shall identify specific storm drainage design features to control the 200-year, 10-day increased runoff from the project site to ensure that the rate of runoff leaving the developed site does not exceed the pre-project condition. This may be achieved through: on-site conveyance and detention facilities, storage within the on-site UATA, or equally effective measures to control the rate and volume of runoff.*

The design-level drainage report shall perform an updated net impact evaluation of downstream East Davis Ponding, taking into consideration the final on-site storm water system design, when the downstream flow is blocked by high water levels in the Willow Slough Bypass. The final amount of runoff volume to be detained would be determined with the design-level drainage report. This could result in detaining run-off volume for an extended time period.

Design-level recommendations provided in the drainage report shall be included in the improvements plans prior to their approval by the City of Davis Public Works Utilities and Operations Department.

4.8-5 Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would impede or redirect flood flows, or in flood hazard, tsunami, or seiche zone, risk release of pollutants due to project inundation. Based on the analysis below, and with implementation of mitigation, the impact is *less than significant*.

Given that the Proposed Project and BRPA are located within the same FEMA Flood Zone, the following discussion applies to the potential for both development scenarios to substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would impede or redirect flood flows, or in flood hazard, tsunami, or seiche zone, risk release of pollutants due to project inundation.

Proposed Project, Biological Resources Preservation Alternative

As shown in Figure 4.8-2, the northern portion of the project site/BRPA site is within a FEMA mapped A floodplain zone. The FEMA Zone A is defined as areas which are determined to flood during the one percent annual flood event. The City of Davis Design Standards require that development areas elevate pads for structures one foot above the BFE for the area.

However, as discussed in the Regulatory Context section of this chapter, the Proposed Project/BRPA meets all five criteria to be subject to SB 5. Therefore, the Proposed Project/BRPA would be subject to the requirements of the ULOP, and would be prohibited from developing residential uses within a 200-year floodplain with a potential flood depth above three feet. While the City of Davis requires elevation of the pads one foot above the BFE, final grades for the Proposed Project/BRPA would be based upon the elevations resulting from the Hydraulic Modeling conducted for the Proposed Project and BRPA, which is based on the 200-year recurrence interval storm.

The soil from the on-site agricultural buffer/UATA in the northern portion of the project site/BRPA site would be utilized as fill material within the development area to raise the building sites above the 200-year flood plain. Importation of fill within the floodplain would require approval by FEMA.

All of the proposed improvements would be subject to Article 8.03, Flood Prevention Standards: Authorization, Purpose, and Methods, of the City of Davis Code, which is intended to minimize public and private losses due to flood conditions. The Flood Prevention Standards provide methods for reducing flood losses.

With respect to risking release of pollutants due to project inundation, residential projects do not involve the storage of large amounts of pollutants, and all stormwater exiting the project site would be directed to on-site stormwater quality features to ensure that any pollutants entrained within stormwater from the project site are removed prior to discharge.

Conclusion

Considering the above, the Proposed Project and BRPA are not anticipated to result in the impediment or redirection of flood flows such that on- or off-site structures would be exposed to flood risk. However, a Conditional Letter of Map Revision (CLOMR) would be required prior to improvement plan approval in order to ensure the project's compliance with existing regulations. Therefore, in the absence of a CLOMR submitted to FEMA, a ***significant*** impact could occur related to alteration of the existing drainage pattern of the site or area, including through alteration of a course of a stream or river or through the addition of impervious surfaces, in a manner which would impede or redirect flood flows.

Mitigation Measure(s)

Implementation of the following mitigation measure would reduce the above potential impact to a *less-than-significant* level by ensuring that the project complies with all regulations needed to ensure that new impervious surfaces created by the project do not impede or redirect flood flows.

Proposed Project, Biological Resources Preservation Alternative

4.8-5 *Prior to improvement plan approval, and if required by the Federal Emergency Management Agency (FEMA), the Yolo County Flood Control and Water Conservation District, or the County Floodplain Administrator, the applicant shall obtain from FEMA a Conditional*

Letter of Map Revision (CLOMR) or Conditional Letter of Map Revision based on Fill (CLOMR-F) for fill within a Special Flood Hazard Area. A copy of the letter shall be provided to the City of Davis Public Works Engineering and Transportation Department. A Letter of Map Revision (LOMR), or a Letter of Map Revision based on Fill (LOMR-F) from FEMA shall be provided to the City of Davis Public Works Engineering and Transportation Department prior to acceptance of project improvements as complete.

Cumulative Impacts and Mitigation Measures

As defined in Section 15355 of the CEQA Guidelines, "cumulative impacts" refers to two or more individual effects which, when considered together, are considerable, compound, or increase other environmental impacts. The individual effects may be changes resulting from a single project or a number of separate projects. The cumulative impact from several projects is the change in the environment that results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects.

The cumulative setting for impacts related to hydrology and water quality encompasses the Covell Drain watershed, which, as discussed above, spans a total of approximately 17 square miles, and includes the entirety of the project site, as well as additional land in the project vicinity.

4.8-6 Cumulative impacts related to the violation of water quality standards or waste discharge requirements, groundwater quality, management, and recharge, and impacts resulting from the alteration of existing drainage patterns. Based on the analysis below, the project's incremental contribution to this significant cumulative impact is *less than cumulatively considerable*.

The following discussion includes an analysis of potential cumulative impacts related to the violation of water quality standards or waste discharge requirements, groundwater quality, management, and recharge, and impacts resulting from the alteration of existing drainage patterns associated with the development of the Proposed Project and the BRPA. Because the components of the Proposed Project and the BRPA would both include components with potential to cumulatively impact water quality, groundwater, and drainage patterns, the following evaluation applies to both development scenarios.

Proposed Project, Biological Resources Preservation Alternative

Impacts related to stormwater quality, groundwater, and drainage patterns are discussed separately below.

Stormwater Quality

Construction activities have the potential to affect water quality and contribute to localized violations of water quality standards if stormwater runoff from construction activities enters receiving waters. Runoff from additional construction sites within the project area could carry sediment from erosion of graded or excavated surface

materials, leaks or spills from equipment, or inadvertent releases of building products, which could result in water quality degradation if runoff containing such sediment or contaminants should enter receiving waters in sufficient quantities. Thus, construction activities associated with the Proposed Project/BRPA, in combination with construction activities associated with other reasonably foreseeable projects in the Covell Drain watershed, could result in cumulative impacts related to water quality. However, all construction projects resulting in disturbance of more than one acre of land are required to comply with the most current Construction General Permit requirements. Conformance with the Construction General Permit would require preparation of SWPPPs for all such projects, and subsequent implementation of BMPs to prevent the discharge of pollutants. Considering the existing permitting requirements for construction activity in the project area, cumulative construction within the Covell Drain watershed would be heavily regulated and impacts related to the degradation of water quality would be minimized to the extent feasible.

Similar to the Proposed Project/BRPA, cumulative development within the City of Davis would be subject to Phase II MS4 stormwater requirements, including source control and treatment control features. Specifically, regulated projects are required to divide the project area into DMAs and implement and direct water to appropriately-sized SDMs and Baseline Hydromodification Measures to each DMA. Source control measures must be designed for pollutant-generating activities or sources consistent with recommendations from the CASQA Stormwater BMP Handbook for New Development and Redevelopment, or equivalent manual, and must be shown on improvement plans.

Based on the conceptual stormwater design, during operations, the stormwater runoff would be properly treated prior to discharge from the site. Thus, urban pollutants entering and potentially polluting the local drainage system would not be expected to occur as a result of the Proposed Project/BRPA. A final drainage report would be required with submittal of the Improvement Plans for City review and approval to substantiate the preliminary report's LID sizing calculations. In addition, pursuant to Phase II MS4 requirements, a Post Construction Stormwater Control Plan would be required for the Proposed Project/BRPA. The Proposed Project/BRPA would be subject to NPDES Construction General Permit requirements, including implementation of BMPs and preparation of a site-specific SWPPP. Cumulative development projects within the project area would also be subject to Phase II MS4 stormwater requirements, as well as all City requirements related to stormwater treatment and control. Compliance with the foregoing regulations would ensure that impacts related to the alteration of drainage patterns, the discharge of pollutants, and flooding are minimized to the extent feasible.

Groundwater

Cumulative development within the project region would result in increased amounts of impervious surfaces, which would reduce the infiltration of groundwater within the project region. Although cumulative development would increase the amount of impervious surfaces in the project region, stormwater would continue to be discharged to the Covell Drain, and other local waterways, where stormwater could partially infiltrate into the soil and recharge groundwater. Furthermore, the project site/BRPA site itself is not considered a site of substantial groundwater recharge; thus,

development of the Proposed Project/BRPA would not result in a significant cumulative loss of groundwater recharge.

Groundwater in the project region is managed on a subbasin level. The Yolo Subbasin, within which the project is located, is not in a state of overdraft, and the Yolo Subbasin Groundwater Sustainability Plan (GSP) will continue to manage groundwater in the region.

Because groundwater is managed on a subbasin level, and the Proposed Project/BRPA would not result in a substantial site-specific loss of groundwater recharge, the Proposed Project/BRPA, in combination with cumulative development within the region, would not result in a significant cumulative impact to groundwater recharge.

Cumulative Flows and Volumetrics

As discussed, the treated stormwater runoff from the Proposed Project/BRPA site would be routed to Channel A. There are two other reasonably foreseeable cumulative projects whose treated runoff would be discharged to Channel A, downstream of the Village Farms site. These reasonably foreseeable projects are Palomino Place and Shriners Property. A Cumulative Storm Drainage Impacts Memorandum was prepared by Cunningham Engineering to evaluate the cumulative hydrologic impacts downstream of the Proposed Project/BRPA.[20] Specifically, Cunningham Engineering assessed the volumetric impact on East Davis Ponding, located downstream of the Proposed Project/BRPA, Palomino Place, and Shriners Property. The Memorandum notes that the Davis Innovation and Sustainability Campus (DiSC) 2022 Project was also considered; however, because the DiSC 2022 project would result in zero net discharge to the East Davis ponding, it was therefore not included in the cumulative evaluation. The BRPA's impact to the East Davis ponding was considered the governing project condition, and was utilized below to establish, qualitatively, the effective volumetric cumulative impacts on the East Davis ponding.

Using available data from the Village Farms drainage study, Cunningham Engineering qualitatively compared the peak stage effects from the Village Farms Davis project and extrapolated an equivalent impact resulting from the Palomino Place and the Shriners Property projects using computations. The results are shown in Table 4.8-7, which illustrate that the Proposed Project/BRPA, in combination with cumulative development, is anticipated to result in approximately 0.036-foot of increase to water surface elevations within the East Davis ponding area in the 200-year, 10-day storm event.

[20] Cunningham Engineering. *Village Farms Davis – Cumulative Storm Drainage Impacts Memorandum*. November 27, 2024.

Table 4.8-7
Cumulative 200-Year, 10-Day Peak Stage
East Davis Ponding

Village Farms Davis	Shriners Property	Palomino Place	Total Cumulative Net Impact to East Davis Pond Storage
0.02 feet	0.01424 feet	0.00192 feet	0.03616 feet

Source: Cunningham Engineering, 2024.

This is a slight increase over the East Davis Ponding increase estimates attributable to the Proposed Project alone (0.01 feet) and the BRPA alone (0.02 feet). Should additional design level detail become available for the Palomino Place and Shriners Property projects stormwater systems, this information would be accounted for in the design-level drainage report required by Mitigation Measure 4.8-4.

Similar to the Proposed Project/BRPA, additional cumulative development that could occur within the Covell Drain watershed would be subject to the applicable provisions of the City's NPDES Phase II MS4 general permit. Regulated projects are required to divide the project area into DMAs and implement and direct water to appropriately sized DMAs and Baseline Hydromodification Measures within each DMA. Source-control measures must be designed for pollutant-generating activities or sources consistent with recommendations from the CASQA Stormwater BMP Handbook for New Development and Redevelopment, or equivalent manual, and must be shown on the improvement plans. In addition, new storm drain infrastructure would be required to be designed consistent with applicable standards set forth by the City of Davis Public Works Revised Design Standards, ensuring that new drainage features limit the potential for on- or off-site site flooding to occur. Overall, based on compliance with the foregoing regulations and the cumulative impact to the peak stage water surface elevations within the East Davis ponding area, cumulative development within the watershed would not substantially alter the existing drainage pattern of the area in a manner which would result in substantial adverse effects, and a less-than-significant impact would occur.

Conclusion

As discussed throughout this chapter, implementation of the Proposed Project/BRPA would include LIDs and BMPs to minimize the potential for the Proposed Project/BRPA to result in impacts related to hydrology and water quality. Moreover, implementation of the Proposed Project/BRPA would not result in a significant incremental contribution to cumulative impacts related to peak flows or flooding due to changes in drainage patterns at the project site/BRPA site. Given the analysis presented in this chapter, the conclusions reached by Cunningham Engineering, and the highly regulated nature of cumulative development in the project region, the project's incremental contribution to the significant cumulative impact would be ***less than cumulatively considerable***.

Mitigation Measure(s)

None required.