

## HYDROLOGY AND WATER QUALITY STUDY

**PURPOSE:** This hydrology and water quality study was prepared in support of an Initial Study under CEQA for the Valley Ranch, Unit 4, development Project. The study was requested by the city in an e-mail dated April 19, 2021, from Monica Stegall, and is organized by the lettered bullet points (items “c” through “h”) in the e-mail.



**c. 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 onsite or offsite?:**

No streams or other natural drainages occur in the Project area. Topography in the Project area is relatively flat. Project grading and construction will modify the existing on-site drainage pattern. The Project plans will contain an ‘Erosion & Sedimentation Control Plan’ that requires the Project to implement various temporary and permanent erosion control BMP’s to limit erosion, siltation, and pollution both on and off site.

The Project will disturb greater than one acre. The Project will be required to obtain coverage under the Statewide General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit, 2009-0009-DWQ). The NPDES permit deals with both the construction phase and operational phase of development Projects. For the construction phase of a Project, the NPDES permit identifies the preparation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP defines temporary measures to be implemented to prevent pollutants in stormwater runoff from being discharged from the Project area during construction of the Project. For the operational phase, the NPDES permit requires that the Project meet post-construction standards. The standards require that the Project implement and maintain runoff treatment measures to reduce pollutants discharged from the Project area during the life of the Project. Coverage under the permit would ensure that Project impacts would not substantially alter the existing drainage pattern of the site or area in a manner which would result in substantial erosion, siltation, or pollution onsite or offsite.

**d. 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 onsite or offsite?:**

The Project would increase imperviousness from 0% up to as high as 90%, which would increase rainfall runoff from the site. However, as required by city design standards, the onsite drainage system will be designed such that this increase will not result in onsite flooding. In regards to offsite flooding, see response to item “e”. Project impacts would not alter the existing drainage pattern of the site or area in a manner which would substantially increase the rate or amount of surface runoff in a manner which would result in flooding onsite or offsite.

**e. 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 create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of pollutant runoff?:**

The Project would increase imperviousness from 0% up to as high as 90%, which would increase rainfall runoff from the site. The City of Williams Storm Drain Master Plan (Storm Water Consulting, Inc., and Civil Engineering Solutions, Inc., Final Version, November 2007) includes an analysis that accounts for this increase in runoff and the effects it would have on the existing city drainage facilities. The Project area, as well as the associated existing city drainage facilities serving the Project area, are shown on **Exhibit 1, Storm Drainage Infrastructure Plan, in Attachment 1, Excerpts from the City Drainage Master Plan**. As shown on **Exhibit 1**, the Project lies in the North Central Watershed, which is centered about the “E” Street and Interstate 5 interchange area, and includes approximately 88 acres. Land use in this watershed consists of roadway surfaces and existing and proposed commercial developments. Storm water runoff generated in this zone drains to the east of Interstate 5 and flows within a 36” storm drain along “E” Street, discharging into Husted Lateral at the intersection of “E” Street

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and Husted Road. The analysis assumes buildout land uses of the entire North Central Watershed, and as shown on **Exhibit 2, Land Use Assumptions Map**, the Project area is assumed to be the Commercial land use category, which is consistent with the proposed land use for the Project. As shown on **Exhibit 1**, the existing city drainage facilities serving the Project area have adequate capacity to serve buildout of the North Central Watershed (including the Project area) without the need for any improvements. In regards to potential impacts of additional sources of pollutants, see the response to item "c". Project impacts would not alter the existing drainage pattern of the site or area in a manner which would create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of pollutant runoff.

**f. 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?:**

The current FEMA maps designate the Project area as Zone AH, Areas of 1% Annual Chance Flood with Average Depths between One and Three Feet—see **Attachment 2, Letter of Map Revision Determination Document**, issue date of February 17, 2015, case no. 14-09-4496P, panel 517 of 875. As shown on Attachment 2, the flooding occurs overland across a wide floodplain (not concentrated in a channel). The Projection of the proposed structures across the floodplain would be relatively sparse compared to the flow path of the floodplain, and the structures would not be expected to impede flood flows substantially. Also, the FEMA floodplain is attributed to external flooding (from Salt Creek overflows), and increases in runoff that would result from increase in imperviousness in the Project area would be small relative to the flood flows from the external flooding. Overall, the Project would not substantially alter the existing drainage pattern of the site or area in a manner which would impede or redirect flood flows.

**g. Be located in a flood hazard zone and risk the release of pollutants due to Project inundation?:**

The current FEMA maps designate the Project area as Zone AH, Areas of 1% Annual Chance Flood with Average Depths between One and Three Feet—see **Attachment 2, Letter of Map Revision Determination Document**, issue date of February 17, 2015, case no. 14-09-4496P, panel 517 of 875. As shown Attachment 2, the flooding occurs overland across a wide floodplain (not concentrated in a channel). The city would require proposed structures in the FEMA floodplain to be elevated out of the floodplain, and pollutants stored or occurring in these structures would not be inundated by the 1% annual chance flood. Pollutants stored or occurring in the remaining areas (not elevated above the floodplain) of the Project could be inundated, which could lead to the release of pollutants from the Project. The city would require flood proofing measures, such as a pollutant control plan, for the Project that will prevent the release of pollutants if flooding does occur in these areas (not elevated above the floodplain).

**h. Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?:**

The proposed Project has been designed to be consistent with the applicable portions of the City of Williams Municipal Code Chapter 13.05 - Storm Water and Urban Runoff Pollution Control including:

- 13.05.060 - Best management practices.
- 13.05.070 - Construction storm water measures.

Coverage under the Statewide General Permit for Discharges of Storm Water Associated with Construction Activity (Construction General Permit, 2009-0009-DWQ) will be obtained. The City will require the contractor to prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) to reduce or minimize discharge of

**HYDROLOGY AND WATER QUALITY STUDY**

pollutants from construction activities. Implementation of water quality BMPs as well as adherence to the Project NPDES Construction General Permit conditions will protect water quality during construction and operation of the proposed Project. The Project would not substantially conflict with or obstruct a water quality control plan.

The City water system includes three active and two standby groundwater wells. The wells draw ground water from depths ranging from 120 feet to as deep as 500 feet. This groundwater source is a deeper groundwater aquifer that is recharged primarily from the hills to the west. Considering the large distance between the location of the Project relative to the primary location of groundwater recharge, the Project would not be expected to substantially conflict with or obstruct implementation of a sustainable groundwater management plan.

**HYDROLOGY AND WATER QUALITY STUDY**

**ATTACHMENT 1**

**EXCERPTS FROM THE  
CITY DRAINAGE MASTER PLAN**

*City of Williams*

# **STORM DRAINAGE MASTER PLAN**

*Final Version  
November, 2007*

*Prepared by:*



and

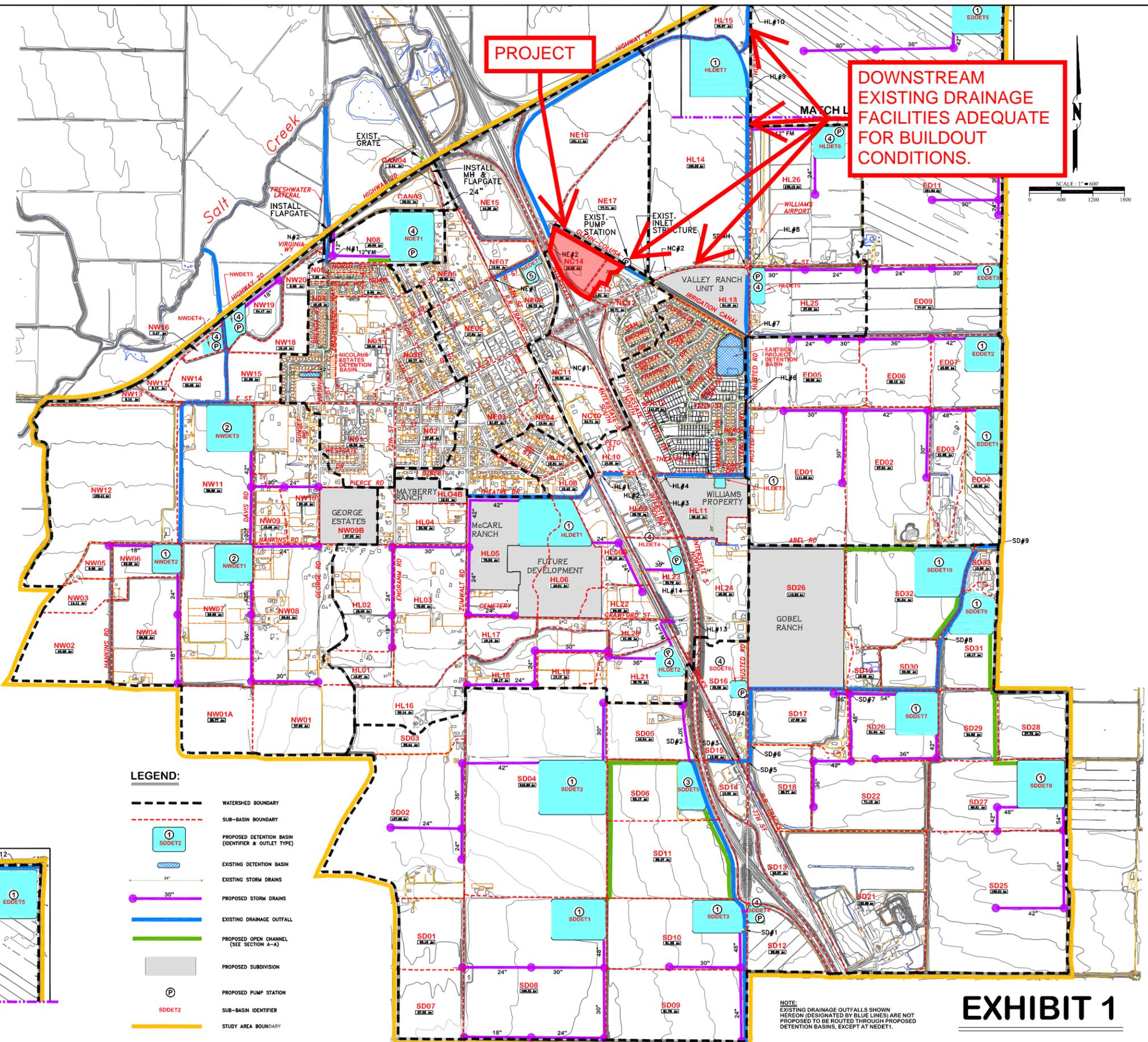
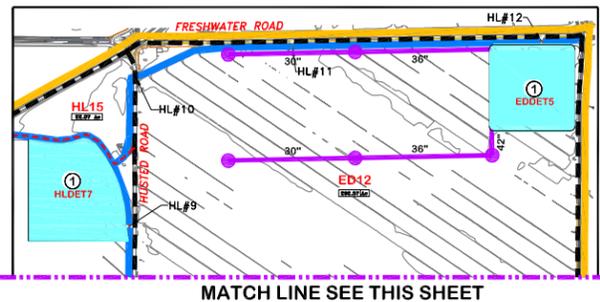
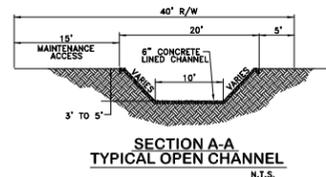


PROPOSED DETENTION BASINS					
DETENTION BASIN NO.	STORAGE VOLUME	SURFACE AREA	INFLOW (CFS)	OUTFLOW (CFS)	OUTLET STRUCTURE TYPE
NWDET1	41 AF	12.0 Ac.	99 cfs	18 cfs	⊙
NWDET2	23 AF	7.6 Ac.	44 cfs	12 cfs	⊙
NWDET3	53 AF	18.0 Ac.	82 cfs	15 cfs	⊙
NWDET4	7 AF	2.3 Ac.	14 cfs	2 cfs	⊙
NWDET5	18 AF	5.0 Ac.	33 cfs	2 cfs	⊙
NWDET6	56 AF	15.7 Ac.	106 cfs	2 cfs	⊙
NEDET1	5 AF	2.5 Ac.	120 cfs	110 cfs	⊙
HLDET1	81 AF	23.1 Ac.	169 cfs	33 cfs	⊙
HLDET2	37 AF	9.8 Ac.	87 cfs	2 cfs	⊙
HLDET3	5 AF	2.5 Ac.	23 cfs	5 cfs	⊙
HLDET4	10 AF	3.0 Ac.	21 cfs	2 cfs	⊙
HLDET5	15 AF	4.2 Ac.	27 cfs	2 cfs	⊙
HLDET6	31 AF	8.3 Ac.	48 cfs	2 cfs	⊙
HLDET7	101 AF	29.2 Ac.	165 cfs	30 cfs	⊙
SDDET1	52 AF	15.9 Ac.	88 cfs	20 cfs	⊙
SDDET2	99 AF	29.2 Ac.	169 cfs	25 cfs	⊙
SDDET3	32 AF	10.0 Ac.	75 cfs	16 cfs	⊙
SDDET4	8 AF	2.3 Ac.	21 cfs	2 cfs	⊙
SDDET5	32 AF	10.7 Ac.	97 cfs	81 cfs	⊙
SDDET6	8 AF	2.3 Ac.	22 cfs	2 cfs	⊙
SDDET7	55 AF	16.9 Ac.	119 cfs	19 cfs	⊙
SDDET8	65 AF	19.5 Ac.	134 cfs	22 cfs	⊙
SDDET9	49 AF	15.0 Ac.	78 cfs	23 cfs	⊙
SDDET10	55 AF	16.9 Ac.	90 cfs	19 cfs	⊙
EDDET1	64 AF	19.5 Ac.	118 cfs	21 cfs	⊙
EDDET2	31 AF	10.0 Ac.	63 cfs	12 cfs	⊙
EDDET3	12 AF	4.2 Ac.	29 cfs	7 cfs	⊙
EDDET4	31 AF	10.0 Ac.	57 cfs	15 cfs	⊙
EDDET5	65 AF	19.5 Ac.	88 cfs	23 cfs	⊙

**DETENTION BASIN OUTLET TYPES**

- ⊙ 12" PIPE PRIMARY OUTLET; 20" WEIR AT 3' DEPTH.
- ⊙ GRADUATING DISCHARGE 0 cfs TO 20 cfs BASED ON DEPTH.
- ⊙ GRADUATING DISCHARGE 0 cfs TO 80 cfs BASED ON DEPTH.
- ⊙ PUMP DISCHARGE AT 2 cfs.
- ⊙ DISCHARGE BASED ON EXISTING 2-5'x2' CBC CAPACITY.

CULVERT INFORMATION					
ID NO.	CULVERT SIZE	APPROXIMATE CAPACITY (cfs)	100-YR (cfs)	10-YR (cfs)	PROPOSED UPGRADE
N#1	36" PIPE	55	23	14	N/A
N#2	1 - 6'x3'R/CB	132	36	23	N/A
NE#1	42" CMP	80	81	54	N/A
NE#2	2 - 5'x2'R/CB	150	54	41	N/A
NC#1	24" RCP	20	29	20	N/A
NC#2	36" SD	35	55	37	N/A
HL#1	24" CMP	20	33	6	30" CMP
HL#2	36" PIPE	55	33	6	N/A
HL#3	3'x3'R/CB	72	36	19	N/A
HL#4	48" RCP	115	36	19	N/A
HL#5	2-36" CMP	110	36	19	N/A
HL#6	2-36" CMP	110	64	43	N/A
HL#7	BOX CULVERT	UNKNOWN	118	76	N/A
HL#8	36" PIPE	55	118	76	N/A
HL#9	UNKNOWN	UNKNOWN	163	104	N/A
HL#10	UNKNOWN	UNKNOWN	220	148	N/A
HL#11	UNKNOWN	UNKNOWN	220	148	N/A
HL#12	36" PIPE	55	220	148	N/A
HL#13	24" RCP	20	12	12	N/A
HL#14	24" RCP	20	2	1	N/A
SD#1	5'x4'R/CB	185	75	48	N/A
SD#2	5'x5'R/CB	255	60	29	N/A
SD#3	36" RCP	55	63	34	48" RCP
SD#4	36" RCP	55	63	34	48" RCP
SD#5	48" CMP	115	63	34	N/A
SD#6	48" CULVERT	115	63	34	N/A
SD#7	48" CULVERT	115	65	34	N/A
SD#8	48" CULVERT	115	81	41	N/A
SD#9	UNKNOWN	UNKNOWN	125	53	N/A



- LEGEND:**
- WATERSHED BOUNDARY
  - - - SUB-BASIN BOUNDARY
  - ① PROPOSED DETENTION BASIN (IDENTIFIER & OUTLET TYPE)
  - ⊙ EXISTING DETENTION BASIN
  - EXISTING STORM DRAINS
  - PROPOSED STORM DRAINS
  - EXISTING DRAINAGE OUTFALL
  - PROPOSED OPEN CHANNEL (SEE SECTION A-A)
  - PROPOSED SUBDIVISION
  - ⊙ PROPOSED PUMP STATION
  - ⊙ SUB-BASIN IDENTIFIER
  - STUDY AREA BOUNDARY

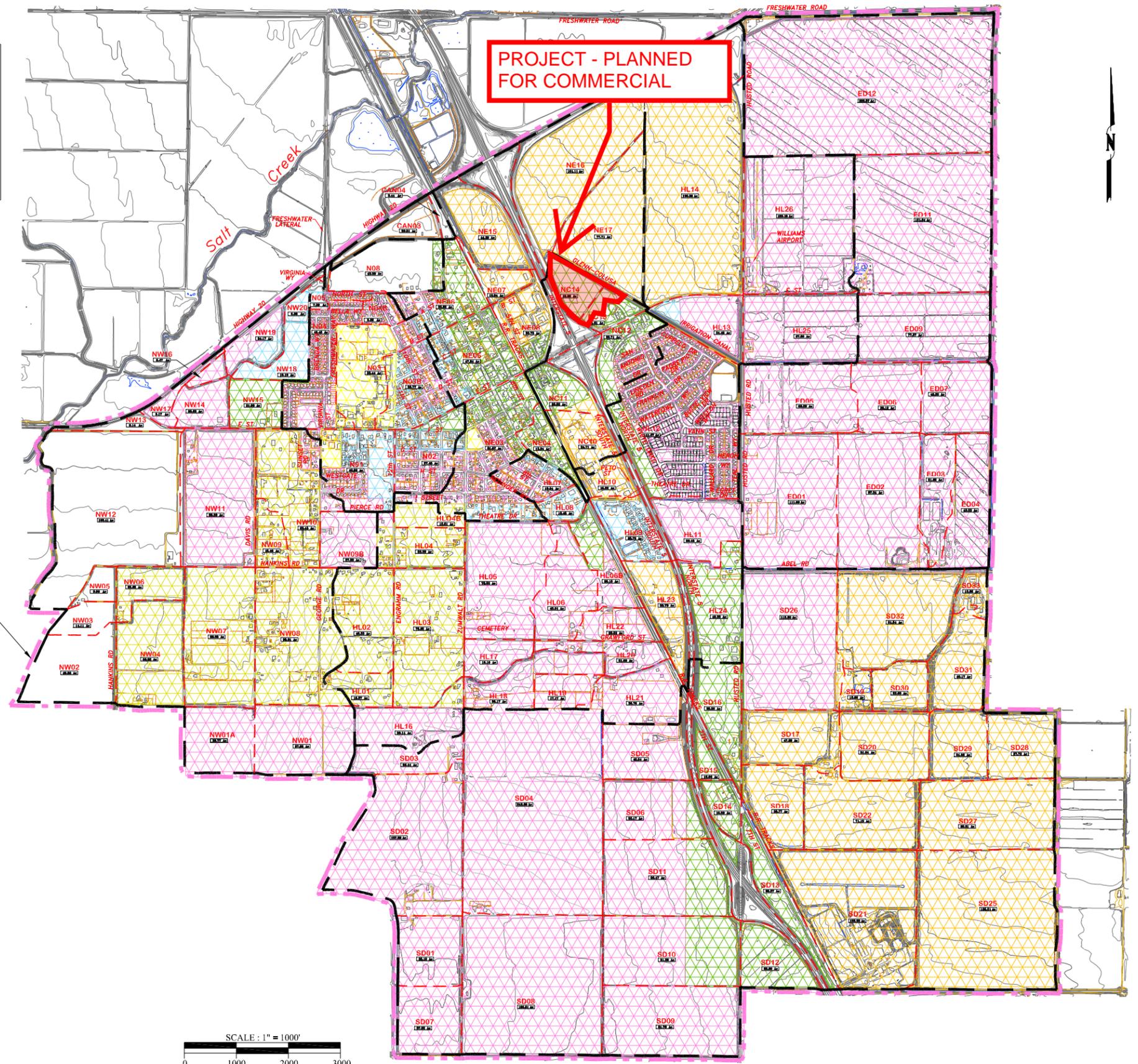
NOTE: EXISTING DRAINAGE OUTFALLS SHOWN HEREON (DESIGNATED BY BLUE LINES) ARE NOT PROPOSED TO BE ROUTED THROUGH PROPOSED DETENTION BASINS, EXCEPT AT NEDET1.

**EXHIBIT 1**

**PROPOSED LAND USES**

	SINGLE FAMILY RESIDENTIAL	5 D.U./ACRE
	MEDIUM/HIGH DENSITY RESIDENTIAL	17-22 D.U./ACRE
	LOW DENSITY RESIDENTIAL	0.2-1 D.U./ACRE
	COMMERCIAL	
	INDUSTRIAL	
	PUBLIC FACILITY	

NOTE:  
PROPOSED LAND USE ASSUMPTIONS  
PROVIDED BY CITY OF WILLIAMS  
04-26-07



# EXHIBIT 2

P:\PROJECTS\2007\27\EXHIBITS\EXH-5\_LAND\_USE.DWG Nov 01, 2007 - 04:50 pm LADONNAHILTY

DRAWN BY: L.J.H.	DESIGN BY: S.A.
CHECKED BY: J.H.N.	DWG: EXH-5.dwg
Dwg:	

REVISION	DATE	DESCRIPTION	APPROVED	DATE



**CIVIL ENGINEERING SOLUTIONS, INC.**  
1325 Howe Avenue, Suite 202  
Sacramento CA, 95825  
(916) 563 - 7300 fax (916) 563 - 7362



*Storm Water Consulting Inc.*  
1899 Sapphire Way  
El Dorado Hills, CA 95762  
ph (916) 801-3962

**CITY OF WILLIAMS**  
**STORM DRAINAGE MASTER PLAN**  
**LAND USE ASSUMPTIONS MAP**

CITY OF WILLIAMS      COUNTY OF COLUSA      CALIFORNIA

DATE: NOVEMBER 2007	SHEET
SCALE: 1"=1000'	EXH-2
	OF
	3
W.O. NO. 2007.51	

**HYDROLOGY AND WATER QUALITY STUDY**

**ATTACHMENT 2**

**LETTER OF MAP REVISION  
DETERMINATION DOCUMENT**



# Federal Emergency Management Agency

Washington, D.C. 20472

## LETTER OF MAP REVISION DETERMINATION DOCUMENT

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	Colusa County California (Unincorporated Areas)	NO PROJECT	HYDRAULIC ANALYSIS HYDROLOGIC ANALYSIS UPDATED TOPOGRAPHIC DATA
	COMMUNITY NO.: 060022		
IDENTIFIER	City of Williams Updated H & H	APPROXIMATE LATITUDE & LONGITUDE: 39.166, -122.150 SOURCE: USGS QUADRANGLE DATUM: NAD 83	
ANNOTATED MAPPING ENCLOSURES		ANNOTATED STUDY ENCLOSURES	
TYPE: FIRM* NO.: 06011C0516F DATE: May 15, 2003 TYPE: FIRM* NO.: 06011C0517F DATE: May 15, 2003 TYPE: FIRM* NO.: 06011C0518F DATE: May 15, 2003		DATE OF EFFECTIVE FLOOD INSURANCE STUDY REPORT: May 15, 2003 PROFILE: 09P NEW PROFILE: 09P(a) DELETED PROFILE: 11P SUMMARY OF DISCHARGES TABLE: 1	

Enclosures reflect changes to flooding sources affected by this revision.

\* FIRM - Flood Insurance Rate Map; \*\* FBFM - Flood Boundary and Floodway Map; \*\*\* FHBM - Flood Hazard Boundary Map

### FLOODING SOURCE(S) & REVISED REACH(ES)

Salt Creek - from the upstream side of Freshwater Road to approximately 450 feet upstream of State Route 99W  
 Salt Creek Overflow 2 - from the upstream side of I-5 Business to approximately 350 feet upstream of North Street

### SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Salt Creek	Zone AH	Zone AH	YES	NONE
	BFEs*	BFEs	YES	NONE
	Zone AE	Zone AH	YES	NONE
Salt Creek Overflow 2	Zone AH	Zone AH	YES	NONE
	BFEs	BFEs	YES	NONE

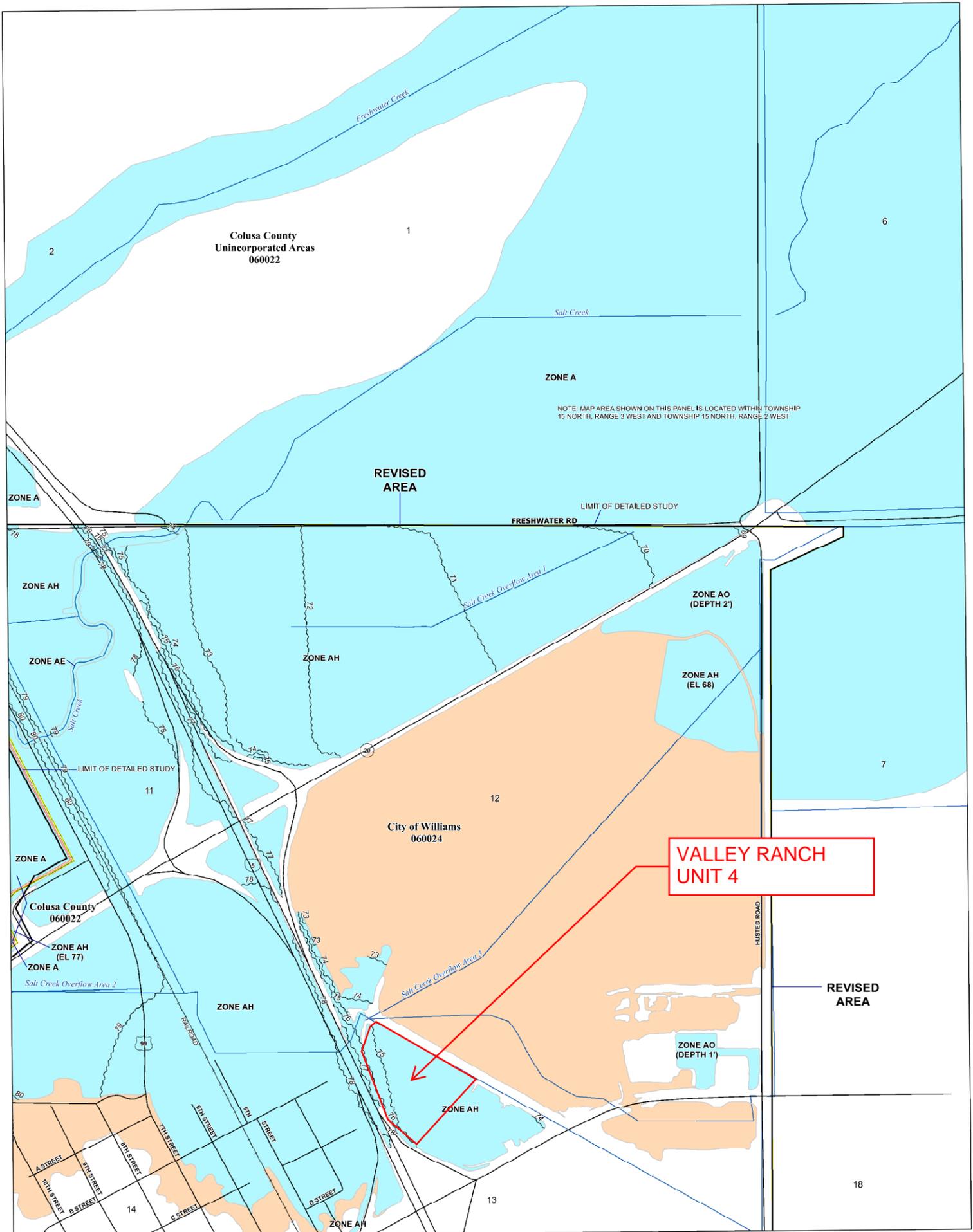
\* BFEs - Base Flood Elevations

### DETERMINATION

This document provides the determination from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the Flood Insurance Study (FIS) report and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panels revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Information eXchange toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMC Clearinghouse, 847 South Pickett Street, Alexandria, VA 22304-4605. Additional Information about the NFIP is available on our website at <http://www.fema.gov/nfip>.

Luis Rodriguez, P.E., Chief  
 Engineering Management Branch  
 Federal Insurance and Mitigation Administration



**FLOOD HAZARD INFORMATION**

SEE FIS REPORT FOR ZONE DESCRIPTIONS AND INDEX MAP  
**THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT [HTTP://MSC.FEMA.GOV](http://MSC.FEMA.GOV)**

<b>SPECIAL FLOOD HAZARD AREAS</b>	Without Base Flood Elevation (BFE) Zone A.V, A99
	With BFE or Depth Zone AE, AO, AH, VE, AR
	Regulatory Floodway
<b>OTHER AREAS OF FLOOD HAZARD</b>	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
	Future Conditions 1% Annual Chance Flood Hazard Zone X
	Area with Reduced Flood Risk due to Levee See Notes, Zone X
<b>OTHER AREAS</b>	NO SCREEN Areas of Minimal Flood Hazard Zone X
	Area of Undetermined Flood Hazard Zone D
<b>GENERAL STRUCTURES</b>	Channel, Culvert, or Storm Sewer Accredited or Provisionally Accredited Levee, Dike, or Floodwall
	Non-accredited Levee, Dike, or Floodwall
<b>OTHER FEATURES</b>	Cross Sections with 1% Annual Chance Water Surface Elevation (BFE) 18.2 17.5
	Coastal Transect
	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature
	Base Flood Elevation Line (BFE)
	Limit of Study
	Jurisdiction Boundary

**NOTES TO USERS**

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at <http://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction. To determine if flood insurance is available in the community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

**BASE MAP**

**NOTES**

Limit of Moderate Wave Action (LimWA)

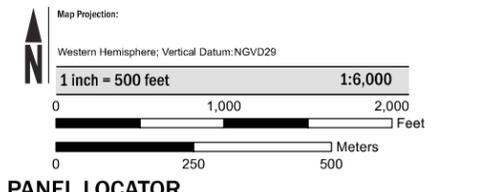
**COASTAL BARRIER RESOURCES SYSTEM (CBRS) NOTE**  
 This map includes approximate boundaries of the CBRS for informational purposes only. Flood insurance is not available within CBRS areas for structures that are newly built or substantially improved on or after the date(s) indicated on the map. For more information see [http://www.fws.gov/nahabitatconservation/coastal\\_barrier.html](http://www.fws.gov/nahabitatconservation/coastal_barrier.html), the FIS Report, or call the U.S. Fish and Wildlife Service Customer Service Center at 1-800-344-WILD.

**CUSTOMNOTES**

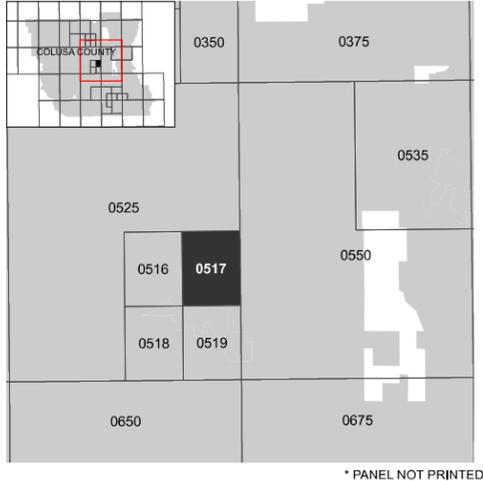
CBRS Area

Otherwise Protected Area

**SCALE**



**PANEL LOCATOR**



**NATIONAL FLOOD INSURANCE PROGRAM**  
 FLOOD INSURANCE RATE MAP

**COLUSA COUNTY, CALIFORNIA**  
 And Incorporated Areas

PANEL 517 OF 875

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
COLUSA COUNTY	060022	0517	F
WILLIAMS, CITY OF	060024	0517	F

REVISED TO REFLECT LOMR EFFECTIVE: July 2, 2015

VERSION NUMBER  
**1.1.1.0**

MAP NUMBER  
**06011C0517F**

EFFECTIVE DATE  
**MAY 15, 2003**