

Flood Hazard Exposure/Loss	Marana	Oro Valley	Pascua Yaqui Tribe	Sahuarita	South Tucson	Tucson	Unincorporated Pima County	Total
Total Critical Facilities	270	132	17	74	20	1,552	1,374	3,439
Facilities in High Hazard Areas	99	7	0	23	0	71	91	291
Percentage of Total Facilities	36.7%	5.3%	0.0%	31.1%	0.0%	4.6%	6.6%	8.5%
Estimated Replacement Cost (x \$1,000)	\$418,998	\$9,896	\$0	\$140,530	\$0	\$199,014	\$234,820	\$1,003,258
Estimated Structure Loss (x \$1,000)	\$83,800	\$1,979	\$0	\$28,106	\$0	\$39,803	\$46,964	\$200,652
Facilities in Medium Hazard Areas <u>Not Protected by Levees</u> *	36	0	13	0	0	71	14	134
Percentage of Total Facilities *	13.3%	0.0%	76.5%	0.0%	0.0%	4.6%	1.0%	3.9%
Estimated Replacement Cost (x \$1,000) *	\$102,348	\$0	\$95,391	\$0	\$0	\$242,089	\$35,197	\$475,025
Estimated Structure Loss (x \$1,000) *	\$5,117	\$0	\$4,770	\$0	\$0	\$12,104	\$1,760	\$23,751
Facilities in Medium Hazard Areas <u>Protected by Levees</u> *	4	3	0	0	0	18	9	34
Percentage of Total Facilities *	1.5%	2.3%	0.0%	0.0%	0.0%	1.2%	0.7%	1.0%
Estimated Replacement Cost (x \$1,000) *	\$1,818	\$20,876	\$0	\$0	\$0	\$8,640	\$76,770	\$108,104
Estimated Structure Loss (x \$1,000) *	\$91	\$1,044	\$0	\$0	\$0	\$432	\$3,838	\$5,405
Total Population	34,718	40,806	3,691	25,267	5,612	523,012	337,676	970,782

**PIMA COUNTY
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN**

2017

Population in High Hazard Areas	2,914	563	279	803	3	16,013	17,376	37,951
Percent Exposed	8.4%	1.4%	7.6%	3.2%	0.1%	3.1%	5.1%	3.9%
Population in Medium Hazard Areas Not Protected by Levees *	8,413	97	3,370	754	0	22,668	6,379	41,681
Percent Exposed *	24.2%	0.2%	91.3%	3.0%	0.0%	4.3%	1.9%	4.3%
Population in Medium Hazard Areas Protected by Levees *	784	649	0	0	0	62	1,529	3,024
Percent Exposed *	2.3%	1.6%	0.0%	0.0%	0.0%	0.0%	0.5%	0.3%
Total Residential Building Count	14,615	20,205	896	10,626	2,116	231,414	157,525	437,397
Estimated Replacement Cost (x \$1,000)	\$3,636,438	\$5,710,908	\$146,861	\$2,673,610	\$364,907	\$66,121,087	\$36,203,274	\$114,857,085
Structures in High Hazard Areas	1,155	283	66	281	1	7,622	7,083	16,491
Percentage of Total Structures	7.9%	1.4%	7.4%	2.6%	0.0%	3.3%	4.5%	3.8%
Estimated Replacement Cost (x \$1,000)	\$273,173	\$79,888	\$10,669	\$69,088	\$117	\$2,204,333	\$1,363,762	\$4,001,030
Estimated Structure Loss (x \$1,000)	\$54,635	\$15,978	\$2,134	\$13,818	\$23	\$440,867	\$272,752	\$800,206
Structures in Medium Hazard Areas Not Protected by Levees *	3,221	46	815	316	0	10,633	2,755	17,786
Percentage of Total Structures *	22.0%	0.2%	91.0%	3.0%	0.0%	4.6%	1.7%	4.1%
Estimated Replacement Cost (x \$1,000) *	\$704,812	\$13,161	\$134,904	\$71,172	\$0	\$2,801,127	\$580,502	\$4,305,678
Estimated Structure Loss (x \$1,000) *	\$35,241	\$658	\$6,745	\$3,559	\$0	\$140,056	\$29,025	\$215,284
Structures in Medium Hazard Areas Protected by Levees *	290	329	0	0	0	20	573	1,212
Percentage of Total Structures *	2.0%	1.6%	0.0%	0.0%	0.0%	0.0%	0.4%	0.3%
Estimated Replacement Cost (x \$1,000) *	\$67,848	\$94,766	\$0	\$0	\$0	\$5,827	\$125,144	\$293,585
Estimated Structure Loss (x \$1,000) *	\$3,392	\$4,738	\$0	\$0	\$0	\$291	\$6,257	\$14,679
* Medium hazard area figures ONLY include critical facilities, population, or structures outside of high hazard areas (but within medium hazard areas) Sources: U.S. Federal Emergency Management Agency, 2016; Pima County GIS, 2016; Pima County Office of Emergency Management, 2012; U.S. Bureau of the Census, 2010; FEMA, HAZUS-MH v3.1, 2016.								

Flood Hazard Exposure/Loss*	Marana	Oro Valley	Pascua Yaqui Tribe	Sahuarita	South Tucson	Tucson	Unincorporated Pima County	Total
Total Critical Facilities	270	132	17	74	20	1,552	1,374	3,439
Facilities in Local Flood Hazard Areas	0	0	0	1	0	23	27	51
Percentage of Total Facilities	0.0%	0.0%	0.0%	1.4%	0.0%	1.5%	2.0%	1.5%
Estimated Replacement Cost (x \$1,000)	\$0	\$0	\$0	\$145	\$0	\$103,425	\$247,040	\$350,610
Estimated Structure Loss (x \$1,000)	\$0	\$0	\$0	\$29	\$0	\$20,685	\$49,408	\$70,122
Total Population	34,718	40,806	3,691	25,267	5,612	523,012	337,676	970,782
Population in Local Flood Hazard Areas	168	11	1	105	0	9,248	10,519	20,052
Percent Exposed	0.5%	0.0%	0.0%	0.4%	0.0%	1.8%	3.1%	2.1%
Total Residential Building Count	14,615	20,205	896	10,626	2,116	231,414	157,525	437,397
Estimated Replacement Cost (x \$1,000)	\$3,636,438	\$5,710,908	\$146,861	\$2,673,610	\$364,907	\$66,121,087	\$36,203,274	\$114,857,085
Structures in Local Flood Hazard Areas	83	4	0	47	0	4,119	4,717	8,970
Percentage of Total Structures	0.6%	0.0%	0.0%	0.4%	0.0%	1.8%	3.0%	2.1%
Estimated Replacement Cost (x \$1,000)	\$22,166	\$968	\$0	\$9,627	\$0	\$956,007	\$949,042	\$1,937,810
Estimated Structure Loss (x \$1,000)	\$4,433	\$194	\$0	\$1,925	\$0	\$191,201	\$189,808	\$387,561

* Local Flood Hazard Areas are selected Special Studies Floodplains defined by Pima County, not by FEMA
 Source: Pima County GIS, 2017; Pima County Office of Emergency Management, 2012; U.S. Bureau of the Census, 2010; FEMA, HAZUS-MH v3.1, 2016.

Development Trends

For most Pima County jurisdictions, adequate planning and regulatory tools are in place to regulate future development. Challenges with new growth will include the need for master drainage planning and additional floodplain delineations to identify and map the flood hazards within the growth areas where no mapping currently exists. In anticipation of development, Pima County assures that subdivisions are protected. Studies of watersheds and high flood hazard areas are identified before development, so that they are avoided as much as possible and prospective developers are aware of any remaining issues such as all-weather accessibility.

Future flood hazards are more likely to be significant outside of the urban core where much of the existing development pre-dates regulation that is more stringent or where the regulation of hazards including road access is currently limited. However, events of greater magnitude than the base flood due to climate variability may increase flood related hazards throughout Pima County.

The PCRFCDD has been actively creating new floodplain delineations outside of FEMA designated floodplains and continually strives to improve floodplain development to create a more flood resilient community. Because of mapping efforts, the aerial extent of local floodplains within Pima County exceeds the extent of federally mapped floodplains. In addition to elevating structures above the base flood, the PCRFCDD has recently made great strides forward in protecting structures from erosion hazards using setbacks from regulatory washes and protecting building foundations for structures placed in regulatory floodplains. Robust protection of natural floodplain functions and the acquisition of flood prone land further removed development pressure on some of the most hazardous areas further increasing flood resilience of Pima County.

The vegetation characteristics of Pima County's arid environment, combined with anthropomorphic alterations to the landscape, create conditions that promote the lateral migration of watercourses. Erosion along major watercourses has been some of the most dramatic flood damage in recent history. For this reason, Pima County does not allow new construction within erosion hazard areas unless structural protections are in place. Furthermore, the PCRFCDD's CIP has focused on providing bank protection and open space along major watercourses.

Natural floodplains benefit the community by reducing flood and erosion hazards, improving water quality, increasing groundwater recharge and providing biological corridors for plants and wildlife to thrive, all providing a public health, safety, and economic benefit to the citizens of Pima County. To the greatest extent possible, the PCRFCDD promotes maintaining the natural functions of floodplains over structural measures to control flooding.

National Flood Insurance Program Participation

Participation in the NFIP is a key element of any community's local floodplain management and flood mitigation strategy. Pima County and the six other incorporated jurisdictions participate in the NFIP. Joining the NFIP requires the adoption of a floodplain management ordinance that requires jurisdictions to follow established minimum standards set forth by FEMA and the State of Arizona, when developing in the floodplain. These standards require that all new buildings and substantial improvements to existing buildings will be protected from damage by the 100-year flood, and that new floodplain development will not aggravate existing flood problems or increase damage to other properties. As a participant in the NFIP, communities also benefit from having Flood Insurance Rate Maps (FIRM) that map identified flood hazard areas and can be used to assess flood hazard risk, regulate construction practices and set flood insurance rates. FIRMs are also an important source of information to educate residents, government officials and the private sector about the likelihood of flooding in their community. Table 4-13 summarizes the NFIP status and statistics for each of the jurisdictions participating in this Plan.

Table 4-12: NFIP Statistics as of July 31, 2016

Jurisdiction	Community ID	NFIP Entry Date	Current Effective Map Date	Number of Policies	Amount of Coverage (x \$1,000)	Floodplain Management Role
Pima County	040073	2/15/1983	6/16/2011	2,392	\$552,626	Managed through PCRFC
Marana	040118	8/1/1984	6/16/2011	323	\$85,207	Provides floodplain management for the town
Oro Valley	040109	12/4/1979	6/16/2011	182	\$51,057	Provides floodplain management for the town
Pascua Yaqui Tribe	---	---	---	---	---	Not a Participant in the NFIP
Sahuarita	040137	6/30/1997	6/16/2011	41	\$11,239	Provides floodplain management for the town
South Tucson	040075	1/31/1979	6/16/2011	1	\$105	City defers floodplain management to PCRFC
Tucson	040076	8/2/1982	6/16/2011	1,771	\$386,249	Provides floodplain management for the city

Source: <http://bsa.nfipstat.com/reports/1011.htm> (7/31/2016); "Current Effective Map Date" is from FEMA Community Status Report in NFIP (2/16/2011 – and current)

Repetitive Loss Properties

Repetitive Loss (RL) properties are those NFIP-insured properties that since 1978, have experience multiple flood losses. FEMA tracks RL properties and in particular to identify Severe RL (SRL) properties. RL properties demonstrate a record of accomplishment of repeated flooding for a certain location and are one element of the vulnerability analysis. RL properties are also important to the NFIP, since structures that flood frequently put a strain on the National Flood Insurance Fund.

Per data provided to the County by FEMA on May 31, 2016 there are seven unmitigated Repetitive Loss Properties in unincorporated Pima County. One of these has been mitigated however; documents have yet to be submitted to FEMA to have it removed from the list. There are no SRL properties.

Table 4-13: Repetitive Loss Property Statistics by Jurisdiction

Jurisdiction	No. of Properties	No. of Properties Mitigated	Total Payments
Oro Valley	1	0	\$41,805
Tucson	4	0	\$173,829
Unincorporated Pima County	7	3	\$664,067

Source: FEMA, 2016 for Unincorporated Pima County

4.4.6 Landslide

Description

Landslide is the generic term used to describe the downslope movement of earth materials due to gravity. There are several different types of landslides that are categorized by the depth of failure, the type of material moved, the water content, and rate of movement. Landslides may be triggered by earthquakes, extreme precipitation, flooding, or otherwise removing support from the slope. Debris flows, a common type of landslide in Arizona, often occur in areas disturbed by wildfires. Landslides may also cause flooding, either by displacing great volumes of water with surficial materials, or by damming a stream until it breaches and floods. Each physiographic region in Arizona is susceptible to various types of landslides. Pima County is located in the Basin and Range Province.

The Basin and Range Province occupies the southern portions of Arizona and is characterized by alternating valleys (basins) and mountains (ranges). Debris flows, rock falls and translational landslides are the most common type of landslides in Pima County. These landslides typically occur on steep upper slopes of mountain ranges; the material may be deposited at the base of slopes where failures occur, or transported to valley floors and alluvial fans at canyon mouths. Some of the fastest urban growth areas in Pima County are along the mountain fronts; these are vulnerable to debris flows as evidenced by geologic deposits and by recent events¹.

Cascading events are a hazard with landslides. The nature of cascading events associated with landslides stems from the mass, volume, water content, soil and rock conditions, rate of movement, and environs in which the landslide occurs. (It is important to note, that landslides are commonly triggered by other events, e.g., an earthquake or flood, and thus may constitute a cascading event in their own right).

Common cascading events associated with landslides include:

- Damaged or destroyed transportation lines – roads, railways, rivers
- Flooding – resulting from damming of river or water displacement resulting from the landslide mass encroaching on a body of water – natural lake, river, canal or reservoir
- Broken infrastructure – gas pipelines, water mains, sewer lines, utility lines, canals buildings
- Secondary landslides following a primary slide

History

In 2006, extreme precipitation caused ~1,000 debris flows in four mountain ranges in southern Arizona^{2,3}. Debris flows in the Santa Catalina Mountains north of Tucson occurred in nine canyons; debris flows exited or nearly exited the mouths of five of those canyons flowing into developed areas⁴. Costs to repair infrastructure destroyed in Sabino Canyon was ~\$1.5 million while damage in other areas were not documented. While the 2006 debris flows illustrate how damaging large landslide events can be, the Pima County Department of Transportation consistently has to repair damage to roadways from individual landslides, particularly rockfalls along the Santa Catalina Highway according to the Pima County Department of Transportation. Landslides are an ongoing issue within Pima County. No landslides of major significance, such as multiple day road closures, have occurred within the last planning cycle. Minor rockfall slides occasionally shut down mountainous roads, but are quickly cleared

Probability and Magnitude

High-intensity and long-duration precipitation may cause landslides by oversaturating hillslope soils. Disturbances to slopes, particularly from wildfires, changes hydrologic conditions making slopes more susceptible to failure from rainfall runoff generated by commonly occurring storms (high-frequency, low-magnitude storms). Removal of substrate support (soil or rock) from the slopes where highways and roads are built can also result in landslides. Earthquakes may also cause landslides.

¹ Youberg, A.M., Webb, R.H., Fenton, C.R., and Pearthree, P.A., 2014, Latest Pleistocene–Holocene debris flow activity, Santa Catalina Mountains, Arizona; Implications for modern debris-flow hazards under a changing climate: *Geomorphology*, v. 219, p. 87-102.

² Pearthree, P.A., Youberg, A., 2006, *Recent Debris Flows and Floods in Southern Arizona*, Arizona Geology, Vol. 36, No. 3

³ Magirl, C.S., Webb, R.H., Griffiths, P.G., Schaffner, M., Shoemaker, C., Pytlak, E., Yatheendradas, S., Lyon, S.W., Troch, P.A., Desilets, S.L.E., Goodrich, D.C., Unkrich, C.L., Youberg, A., and Pearthree, P.A., 2007, Impact of recent extreme Arizona storms: *Eos, Transactions American Geophysical Union*, v. 88, no. 17, p. 191-193.

⁴ Webb, R.H., Magirl, C.S., Griffiths, P.G., and Boyer, D.E., 2008, Debris Flows and Floods in Southeastern Arizona from Extreme Precipitation in Late July 2006: Magnitude, Frequency, and Sediment Delivery. U.S. Geological Survey Open-File Report 2008-1274, 95 p.

The landslides range in size and frequency, from small, nuisance events (minor shallow landslides, rockfalls) along roads or uninhabited areas, to large, fast-moving, destructive debris flows, with varying effects depending on location. Future climate variability could increase the frequency and number of landslide events if that variability leads to an increase in erosional weather factors.

Vulnerability

The impacts from landslides can cause deaths and damages without warning, throughout many parts of Arizona. In the United States, some of the economic factors that result from landslides include:

- Cost \$3.5 billion a year in damages.
- Causes between 25 and 50 deaths annually.
- Reduction in real estate values and tourist revenue
- Lead to lost human, industrial, agricultural, and forest productivity
- Cause damage to the natural environment⁵.

County-owned facilities most vulnerable to landslides are roadways and bridges/culverts along known debris flow areas on the Catalina Highway up Mount Lemmon within the Coronado National Forest.

Participating Jurisdiction	Probability	Magnitude/Severity	Warning Time	Duration	CPRI Score
Marana	Unlikely	Limited	12-24 hours	<24 hours	1.55
Oro Valley	Possible	Limited	<6 hours	<6 hours	2.20
Pascua Yaqui Tribe	Unlikely	Negligible	<6 hours	<6 hours	1.45
Sahuarita	Unlikely	Negligible	>24 hours	<6 hours	1.00
Tucson	Unlikely	Negligible	<6 hours	<6 hours	1.45
Unincorporated Pima County	Likely	Limited	<6 hours	<6 hours	2.65
County-wide average CPRI =					1.72
<i>Jurisdictions in bold chose the hazard for mitigation in 2017 plan.</i>					

Unincorporated Pima County has ongoing vulnerabilities, particularly along the Santa Catalina Highway, due mainly to rockfalls and debris flows. Pima County Department of Transportation and the Arizona Geological Survey are planning surveys to document areas along the highway that experience repeated landslides to identify areas to potential mitigation efforts. Post-wildfire debris flows are also common in Arizona and Pima County. Some of the more recent post-fire debris flows have been documented⁶ and debris flows that occur in the future will be added to the landslide database.

Loss Estimation

Losses are difficult to estimate given the a lack of accepted measurement standards, however, the County spends significant time and money removing and repairing landslide occurrences along this and several other roadways, especially following precipitation events. During rainfall events, residential properties in the Santa Catalina’s and other regional ranges have suffered damage from land and mudslide events. The losses in the Santa Catalina Sabino Canyon flood and rockslide topped over 1 million dollars in 2006⁷.

⁵ US Geological Survey, 2009, Landslides Hazards Program, online at <http://landslides.usgs.gov/>

⁶ Youberg, A., 2015, Geodatabase of Post-Wildfire Study Basins: Assessing the predictive strengths of post-wildfire debris-flow models in Arizona, and defining rainfall intensity-duration thresholds for initiation of post-fire debris flow. Arizona Geological Survey, geodatabase, excel workbook, report 10 p. http://repository.azgs.az.gov/uri_gin/azgs/dlio/1635

⁷ Arizona State Geological Survey, http://www.azgs.az.gov/Hazards_ocr/slopefailure/Landslide-fact-sheet3.pdf, retrieved 2017

Development Trend Analysis

As development in unincorporated Pima County along the margins of the mountain ranges, building code enforcement is critical for any new development. Roadway improvements or development should follow current Federal Highway Administration design guidelines to avoid landslide hazards.

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4.4.7 Severe Wind

Description

The hazard of severe wind encompasses all climatic events that produce damaging winds. For Pima County, severe winds usually result either from extreme pressure gradients that usually occur in the spring and early summer months, or from thunderstorms. Thunderstorms can occur year-round and are usually associated with cold fronts in the winter, monsoon activity in the summer, and tropical storms in the late summer or early fall. Three types of damaging wind related features typically accompany a thunderstorm, downbursts, straight-line winds, and infrequently, tornadoes.

Downbursts are columns of air moving rapidly downward through a thunderstorm. When the air reaches the ground, it spreads out in all directions, creating horizontal wind gusts of 60 mph or higher. Downburst winds have been measured as high as 140 mph. Downbursts are called macrobursts when the diameter is greater than 2.5 miles, and microbursts when the diameter is 2.5 miles or less. They can be either dry or wet downbursts, where the wet downburst contains precipitation that continues all the way down to the ground, while the precipitation in a dry downburst evaporates on the way to the ground, decreasing the air temperature and increasing the air speed. In a microburst the wind speeds are highest near the location where the downdraft reached the surface, and are reduced as they move outward due to the friction of objects at the surface. Typical damage from downbursts includes uprooted trees, downed power lines, mobile homes knocked off their foundations, block walls and fences blown down, and porches and awnings blown off homes.¹

Straight-line winds are developed similar to downbursts, but are usually sustained for greater periods as a thunderstorm reaches the mature stage, traveling parallel to the ground surface at speeds of 75 mph or higher. These winds are frequently responsible for generating dust storms, sometimes called haboobs, reducing visibility and creating hazardous driving conditions.

A tornado is a rapidly rotating funnel (or vortex) of air that extends from the cloud to the ground. Most funnel clouds do not touch the ground, but when the lower tip of the funnel cloud touches the earth it becomes a tornado and can cause extensive damage. Tornadoes can also form when a dust devil is stretched upward to make contact with a thunderstorm cloud. For Pima County, tornadoes are the least common severe wind.

History

Pima County has had one (1) state / federal declaration involving severe winds. The combined economic loss of this event and those not declared is over \$29.2 million to property and agriculture in the last 50 years, and there were at least three (3) deaths and 103 injuries, with most being related to dust storm related accidents on Interstate 10. In reality, severe wind events occur on a significantly more frequent basis throughout the county, but do not always have reported damages associated with every event. For example, a search of the NCEI storm event database revealed 120 events for the period of September 2011 through September 2016 when searching for “thunderstorm wind,” “tornado,” and “high wind”². However, not all of those events had reports of damages, fatalities, or injuries associated with them. The following are examples of documented past events that have occurred in recent years:

- In June 2009, severe thunderstorm downburst winds caused significant damage at Three Points. Several mobile homes and nearby sheds were either heavily damaged or destroyed. A more substantial brick veneer building was also damaged, with varying degrees of roof damage reported to several homes in Three Points. Several large trees were uprooted completely. Winds from this severe thunderstorm were estimated to be near 85 mph. Three Points Fire reported one injury was received by flying glass, after winds blew out a house window. Damages were estimated to exceed \$150,000².
- In August 2010, local broadcast media reported up to three (3) dozen trees damaged or uprooted in Rancho Vistoso neighborhood. A few ceramic roof tiles were also blown off homes. In addition, a NWS Employee reported several trees down in Dove Mountain with one tree leaning up against a home. There was only slight tile damage to the home. In addition, local broadcast media reported trees and power lines down in Marana at Interstate 10 and Marana/Trico Road as well as a roof ripped off a mobile home. The Marana Airport also sustained damage. Two (2) small airplanes were ripped from their tie down chains and were flipped over while

¹ Arizona Division of Emergency Management, 2004, State of Arizona All Hazard Mitigation Plan.

² National Centers for Environmental Information (NCEI), 2016, <https://www.ncdc.noaa.gov/stormevents/>

another plane was blown into a field. A large hangar door was blown off its tracks and a few other hangars sustained light damage. In the same area, several power poles and lines were downed on Twin Peaks Road east of N. Sandario Road. Damages were estimated to exceed \$100,000².

- Between 2011 and April 2016, there were 73 thunderstorm wind events in Pima County resulting in \$4.766 million dollars in damage. On September 10, 2011, 66 mph winds hit a southern portion of Tucson downing power poles, electric lines, street signs and trees. One (1) trailer park had to be evacuated when a power pole hit a mobile home, and parts of roofs were blown off. Damage was estimated at \$500K³.
- On August 16, 2011, 69 mph winds downed trees and 18 power poles in Marana, closing Ina Road and isolating much of the community. Damage was estimated at \$250K³.
- On July 4, 2011, 58 mph winds brought trees and power poles across the Tucson area destroying buildings and tearing off roofs of a number of buildings. Over 20,000 residents were without power and damage was estimated at \$750K³.
- On July 15, 2012, 70 mph thunderstorm winds uprooted dozens of trees and snapped numerous power poles. About 15,000 customers were left without power. In addition, thunderstorm winds blew in a door at the Tucson Mall, knocking down an interior construction. Damages was estimated at \$100K³.
- On July 5, 2013, 74 mph thunderstorm winds downed two (2) dozen power poles leaving 8,000 customers without electrical power. Thirty mobile homes were damaged by winds or downed trees. Two (2) hangar doors were blown off at the Tucson International Airport. Damage was estimated at \$150K³.
- On July 13, 2014, 75 mph winds brought down telephone and power poles, trees, blew roofs off two (2) east side homes, and flipped over a jet at the Davis-Monthan Air Force Base boneyard. Damage was estimated at \$150,000, as the jets were not operational³.
- On July 6, 2016, 75 mph thunderstorm winds uprooted dozens of large trees from Winterhaven to Himmel Park. Many of the trees fell on apartment buildings, houses and vehicles, and the roof of a church suffered severe wind damage. For some residents, power was not restored until noon on June 27. One (1) person was electrocuted after coming in contact with a live downed wire but survived. Damage was estimated at \$1 million³.

Probability and Magnitude

Most severe wind events are associated with thunderstorms as previously mentioned. According to the NCEI database, from September 2011 to September 2016, Pima County averaged about 27 severe wind events a year totaling \$3.5 million dollars in estimated damages. For that same five-year period, approximately \$5.8 million in damages were estimated³.

The NWS issues a severe thunderstorm watch when conditions are favorable for the development of severe thunderstorms. The local NWS office considers a thunderstorm severe if it produces hail at least 1 inch in diameter, wind of 58 mph or higher, or tornadoes. When a watch is issued for a region, residents are encouraged to continue normal activities but should remain alert for signs of approaching storms, and continue to listen for weather forecasts and statements from the local NWS office. When a severe thunderstorm has been detected by weather radar or one has been reported by trained storm spotters, the local NWS office will issue a severe thunderstorm warning. A severe thunderstorm warning is an urgent message to the affected counties that a severe thunderstorm is imminent. The warning time provided by a severe thunderstorm watch may only be hours, while a severe thunderstorm warning typically provides an hour or less warning time. As such, any future climate variability that increases these storms will increase the probability for damaging winds.

Based on the historic record, the probability of tornadoes occurring in Pima County is limited. Since 1950, 21 tornadoes have been observed. Tornado damage severity is measured by the Enhanced Fujita Tornado Scale, which assigns a numerical value of 0 to 5 based on wind speeds with the letters EF preceding the number (e.g., EFO, EF1, and EF2). All tornadoes in Pima County have been rated at EF2 or lower on the scale but three (3) fatalities and 53

³ National Centers for Environmental Information (NCEI), 2016, <https://www.ncdc.noaa.gov/stormevents/>

injuries have been attributed to tornadoes. Most tornadoes in southern Arizona last less than 15 minutes, have a path length of less than one (1) mile and are less than 100 yards in width⁴.

Vulnerability

Table 4-15: CPRI Results for Severe Wind for 2017

Participating Jurisdiction	Probability	Magnitude/ Severity	Warning Time	Duration	CPRI Score
Marana	Possible	Critical	6 to 12 hours	< 24 hours	2.45
Oro Valley	Likely	Limited	< 6 hours	< 6 hours	2.65
Pascua Yaqui Tribe	Likely	Limited	6 to 12 hours	< 6 hours	2.50
Sahuarita	Likely	Limited	< 6 hours	<1 week	2.85
Tucson	Likely	Limited	<6 hours	<6 hours	2.65
Unincorporated Pima County	Highly Likely	Critical	12-24 hours	< 6 hours	3.10
County-wide average CPRI =					2.68

Jurisdictions in bold chose the hazard for mitigation in 2017 plan.

Severe wind in Tucson usually follows closely on the tails of the summer monsoon season. While heavy rainfall is predictable that time of year, and leads to short-term flash flooding, and the community is resilient to these weather events, severe wind is less predictable with these storms. While the average monsoon storm produces wind gusts between 45 and 65mph, some stronger storms produce straight line winds over 75mph.

Other storms, especially during the beginning of the monsoon in late July when there is still substantial daily ground heating, produce what are called microbursts (rapid pressure changes in the upper atmosphere that lead to large air masses dropping rapidly to the ground creating wind damage in a radius around the storm). Other storms have been reported near Tucson, with funnel clouds, and while most do not touch the ground, if a funnel cloud were to touch down and become a tornado, residents and businesses would find themselves vulnerable for wind damage to their homes and buildings and there would potentially be extreme damage to above ground infrastructure like power distribution systems.

Unincorporated Pima County’s vulnerability is also because of mainly monsoon-type storms. The Pima County Department of Transportation is working to reduce the vulnerability of signs and signal poles to severe wind events such as microbursts. High winds and monsoonal outflows can also damage power lines leading to outages causing loss of cooling for thousands of residents.

Loss Estimations

Severe wind events are unpredictable and the exposure area includes the entire county. The physical damage, once incurred, is usually fairly localized and the discrete incident damages are small relative to other types of hazard events. A thunderstorm microburst wind may knock down miles of power poles and lines and cause economic losses due to the power outages. The economic impact from a large-scale dust storm that shuts down the Interstate 10 can affect the local and regional economy and is difficult to quantify. A recent whitepaper by the Making Action Possible at the University of Arizona, attempts to compare the economic impacts of severe weather events.⁵ For severe winds, this is complicated due to the reporting as thunderstorms in the NCEI datasets. Based on the historic record over the last five (5) years, it is feasible to expect average annual losses of \$0.5 to \$1.0 million countywide. It is difficult to estimate losses for individual jurisdictions within the County due to the lack of discrete data.⁴

⁴ National Centers for Environmental Information (NCEI), 2016, <https://www.ncdc.noaa.gov/stormevents/>

⁵ Making Action Possible (MAP). (February 2, 2017). The Economic Impacts of Extreme Weather: Tucson and Southern Arizona’s Current Risks and Future Opportunities. Tucson, AZ. <https://ktar.com/story/1550887/study-extreme-weather-has-cost-arizona-3-billion-in-damage-since-2010/>

Development Trend Analysis

As severe wind events are relatively unpredictable and imprecise by nature, any further development in the county may lead to more exposures. However, most vulnerable infrastructure such as power lines are now buried rather than going overhead. New traffic signaling meets the latest standards from the United States Department of Transportation's (USDOT's) Manual on Uniform Traffic Control Devices (MUTCD) should be less vulnerable to severe wind by its design. Continued enforcement and implementation of modern building codes to regulate new developments in conjunction with public education on how to respond to severe wind conditions are arguably the best way to mitigate against losses.

4.4.8 *Wildfire*

Description

A wildfire is an uncontrolled fire spreading through vegetative fuels, exposing and possibly consuming structures. They often begin unnoticed, spread quickly, and are usually signaled by dense smoke. Wildfires can be human-caused through acts such as arson, campfires, or the improper burning of debris, or can be caused by natural events such as lightning. Wildfires can be categorized into four types:

- **Wildland fires** occur mainly in areas under federal control, such as national forests and parks, and are fueled primarily by natural vegetation. Generally, development in these areas is nonexistent, except for roads, railroads, power lines, and similar features.
- **Interface or intermix fires** occur in areas where both vegetation and structures provide fuel. These are also referred to as wildland urban interface (WUI) fires. The WUI is commonly described as the zone where structures and other features of human development meet and intermingle with undeveloped wildland or vegetative fuels¹.
- **Firestorms** occur during extreme weather (e.g., high temperatures, low humidity, and high winds) with such intensity that fire suppression is virtually impossible. These events typically burn until the conditions change or the fuel is exhausted.
- **Prescribed fires and prescribed natural fires** are intentionally set or natural fires that are allowed to burn for beneficial purposes.

The following three factors contribute significantly to wildfire behavior and, as detailed more fully later, they can be used to identify wildfire hazard areas:

- **Topography:** As slope increases, the rate of wildfire spread increases. South facing slopes are also subject to greater solar radiation, making them drier and thereby intensifying wildfire behavior. However, ridgetops may mark the end of wildfire spread, since fire spreads more slowly or may even be unable to spread downhill.
- **Fuel:** Wildfires spread based on the type and quantity of available flammable material, referred to as the fuel load. The basic characteristics of fuel include size and shape, arrangement and moisture content. Each fuel is assigned a burn index (the estimated amount of potential energy released during a fire), an estimate of the effort required to contain a wildfire, and an expected flame length.
- **Weather:** The most variable factor affecting wildfire behavior is weather. Important weather variables are temperature, humidity, wind, and lightning. Weather events ranging in scale from localized thunderstorms to large fronts can have major effects on wildfire occurrence and behavior. Extreme weather, such as high temperatures and low humidity, can lead to extreme wildfire activity. By contrast, cooling and higher humidity often signals reduced wildfire occurrence and easier containment. Wind has probably the largest impact on a wildfire's behavior, and is the most unpredictable. Winds supply the fire with additional oxygen, further dry potential fuel, and push fire across the land at a quicker pace.

The frequency and severity of wildfires is also impacted by other hazards, such as lightning, drought, and infestations (e.g., Pine Bark Beetle). In Arizona, these hazards combine with the three other wildfire contributors noted above (topography, fuel, weather) to present an on-going and significant hazard across much of Arizona.

If not promptly controlled, wildfires may grow into an emergency or disaster. Even small fires can threaten lives, resources, and destroy improved properties. It is also important to note that in addition to affecting people, wildfires may severely affect livestock and pets. Such events may require the emergency feeding, shelter, evacuation, and increased event-caused deaths and burying of animals.

The indirect effects of wildfires can also be catastrophic. In addition to stripping the land of vegetation and destroying forest resources, large, intense fires can harm the soil, waterways and the land itself. Soil exposed to intense heat may lose its capability to absorb moisture and support life. Exposed soils erode quickly and enhance siltation of rivers and

¹ Pima County Community Wildfire Protection Plan, 2013: <http://webcms.pima.gov/cms/One.aspx?pageId=45265>

streams thereby enhancing flood potential, harming aquatic life and degrading water quality. Lands stripped of vegetation are also subject to increased landslide hazards.

History

Wildfires have a prominent history in Pima County. Pima County has been included in 17 state and federal wildfire disaster declarations, none of which has occurred since the writing of the 2012 plan. There have been three (3) wildfires that burned more than 10,000 acres in the last fifteen years in Pima County:

- In May of 2002, the Bullock Fire started in Bullock Canyon in the Catalina Mountains on the Coronado National Forest. The fire started on May 21 and continued through June 10. It was suspected to be human induced. The fire burned 30,563 acres along with two (2) cabins and several outbuildings. The residents of Summerhaven were evacuated on May 25 and Catalina Highway closed on May 22. The fire also threatened Mt. Bigelow which had several telecommunication towers and two (2) telescopes, however, fire fighters were able to contain the fire a half of a mile away. The entire firefight costs were estimated to be \$14.3 million².
- In June of 2003, the Aspen Fire was started by human causes on June 17, 2003 and burned for about a month on Mount Lemmon, which is part of the Santa Catalina Mountains located in the Coronado National Forest north of Tucson. The fire burned 84,750 acres of land, and destroyed 333 homes and businesses in the community of Summerhaven. Electric lines, phone lines, water facilities, streets and sewers were also damaged. Total property damages were estimated to exceed \$66 million. Firefight costs were estimated to exceed \$17 million, and the Forest Service spent an estimated \$2.7 million dollars to prevent soil loss. The losses in terms of timber for future lumber are estimated at \$33 million. In 2002, the year before the fire started, Congress had been requested to allocate about \$2,000,000 to cover the implementation of fire prevention measures in the Coronado National Forest. However, that allocation was reduced to about \$150,000 in the Congressional budget process. A presidential disaster declaration (FEMA-1477-DR) was made on July 14, 2003.³
- In June of 2009, the Elk Horn Fire was started by human causes and an area 26 miles southwest of Three Points, Arizona. The fire started June 11, 2009 and was contained on June 22, 2009. The fire burned a total 23,440 acres with \$1M plus in fire suppression costs and five (5) reported injuries related to firefight efforts.

Probability and Magnitude

The probability and magnitude of wildfire incidents for Pima County are influenced by numerous factors including vegetation densities, previous burn history, hydrologic conditions, climatic conditions such as temperature, humidity, and wind, ignition source (human or natural), topographic aspect and slope, and remoteness of area. Wildfire risk for Pima County was mapped based on the data revised for the 2013 Pima County Community Wildfire Protection Plan (PCCWPP)⁴. Pima County and participating jurisdictions and organizations developed the PCCWPP to help local governments, fire departments and districts, and residents identify at-risk public and private lands to protect those lands from a severe wildfire threat.

The PCCWPP identified two (2) models of wildland fuel hazards to represent a typical year of rainfall and an extraordinarily heavy rainfall year to present a range of wildland fuel hazards across the County. Each model divided the fuel hazard into three (3) categories, high, medium and low, and accounted for previous burn areas and the major buffelgrass concerns.

Climate variability may have a positive or negative effect on wildfire risk in the future. Wildfire risk is intertwined with risk of drought in Pima County as well. Figure 4-14 shows the Wildfire hazard potential for Pima County.

² National Wildfire Coordination Group, 2016, Historical ICS 209 reports at: http://fam.nwcg.gov/fam-web/hist_209/report_list_209

³ Arizona Division of Emergency Management, 2013, State of Arizona Multi-Hazard Mitigation Plan; National Wildfire Coordination Group, 2010, Historical ICS 209 reports at: http://fam.nwcg.gov/fam-web/hist_209/report_list_209 ;

⁴ Pima County Community Wildfire Protection Plan 2013, <http://webcms.pima.gov/cms/One.aspx?pageId=45265>

Vulnerability

Table 4-16: CPRI Results for Wildfire for 2017					
Participating Jurisdiction	Probability	Magnitude/Severity	Warning Time	Duration	CPRI Score
Marana	Possible	Critical	< 6 hours	< 1 week	2.70
Oro Valley	Likely	Critical	< 6 hours	> 1 week	3.25
Pascua Yaqui Tribe	Likely	Limited	< 6 hours	< 24 hours	2.75
Sahuarita	Possible	Limited	< 6 hours	< 24 hours	2.30
Tucson	Likely	Negligible	< 6 hours	< 6 hours	2.35
Unincorporated Pima County	Highly Likely	Critical	< 6 hours	> 1 week	3.70
County-wide average CPRI =					2.84
<i>Jurisdictions in bold chose the hazard for mitigation in 2017 plan.</i>					

There has not been a significant WUI event in Marana, but the possibility does exist. The areas of wildland-urban interface (WUI) fire risk in the Town of Marana have been identified. The threat areas primarily consist of the foothills areas of the Tucson and Tortolita Mountains, and the Santa Cruz wash. The threat of a WUI event is directly linked to light fuel vegetation growth, which in turn is tied to rainfall. Without a significant presence of these light fuels (annuals), it is difficult for a fire to carry over a significant distance. The immediate threat would be a WUI event that starts in the Santa Cruz wash due to vegetation overgrowth, causing flying brands or embers to be broadcast over a wide area. Additionally, in times of higher than average rainfall, the Tortolitas (Dove Mountain area) may see an increased WUI potential, but there are natural and fabricated breaks that would provide for a buffer between any residential or business property.

The Town of Oro Valley is susceptible to wildfires due to the border with the Santa Catalina Mountains to the east. On the east side of SR77 in Oro Valley, the homes and businesses are at higher risk to fires due to the proximity to the Catalina's and without major fire breaks like a highway. A fire could potentially burn down the mountain causing concern for homes or businesses located close to those areas. Additionally, wildfires can be more localized due to vegetation overgrowth in washes, buffelgrass, and other available fuels for potential burns. Fire events cause concern to Oro Valley residents on a macro level due to air quality concerns, close proximity to the mountains, and the potential of high visibility fire resources and staging areas for fire crews. Because of the vulnerability to wildfires, regular mitigation projects are identified, prioritized, and completed. This includes the adoption of the PCCWPP, strategic location of wildland crews (GRFD Station #370) to be centralized to potential wildfire threats, and creation of firebreaks in critical areas including along the boundaries of state land surrounding Catalina State Park.

The Pascua Yaqui Tribe's vulnerability to wildland fire is mainly through the wildland fire urban interface. Tribal residences and businesses are situated within areas of natural desert vegetation. In general, brushfires are smaller than three acres. The Tribe is a signee on the PCCWPP and has mutual aid agreements with fire departments in the immediate area and have a cooperative agreement with the BIA in addition to having access to the Tribal Nations Response Team (TNRT).

Unincorporated Pima County is vulnerable for WUI fires in addition to fires on Federal or state land holdings due to high populations living in unincorporated areas in or near the Coronado National Forest, Saguaro National Parks East and West and other open spaces where fuels are moderate to high. The PCCWPP highlights the high population at-risk communities adjacent to public lands administered by the Bureau of Land Management, the National Park Service, and the Coronado National Forest as well as state and county properties. The PCCWPP also contains information on WUI areas in accordance with the Arizona State Forestry Department's guidance. Within 5,877,578 acres, there are 1,579,699 acres designated as WUI with 42% of the WUI being privately held.

Loss Estimations

The Pima County CWPP will be used as a resource to help coordinate long-term interagency mitigation of catastrophic wildfire events in at-risk communities within Pima County. The PCCWPP Core Teams established specific goals for

wildland fire prevention and loss mitigation, but did not address loss estimation, as it is specific to the area characteristics.

The analysis in the PCCWPP includes all risk factors required by the Arizona State Forestry Department. The areas of concern for wildland fuel hazards, risk of ignition and wildfire occurrence, local preparedness, and protection capabilities and loss of community values are evaluated to determine areas of highest wildland fire risk within Pima County. The analysis area included all of Pima County, including tribal lands. The initial analysis depicted all areas within the county at risk for unwanted wildland fire. Subsequent to the initial analysis, the Core Teams identified each Pima County community WUI in accordance with the Arizona State Forestry Division's guidance.⁵

Risk-influencing factors of developed land and other infrastructures within the area of highest flammability were given the highest priority for protection. In areas where community values occur within or adjacent to areas of high risk due to the fuel hazards of vegetation associations, a cumulative risk from catastrophic wildland fire was created.

Loss estimations from the 2012 plan were not redone for the 2017 plan for wildfire. In 2012 \$0.41 and \$1.27 billion in countywide critical facilities are exposed to a high hazard subsidence, with estimated losses of \$82.8 and \$63.3 million, respectively. An additional \$2.89 and \$10.87 billion in county-wide Census 2010 residential housing units are estimated to be exposed to a high and medium wildfire hazard. Regarding human vulnerability, 2.62% of the total countywide population was potentially exposed to a high hazard wildfire event. Similarly, 11.62 percent of the total countywide population was exposed to a medium wildfire hazard. Typically, deaths and injuries not related to firefighting activities are rare.

There is a potential for large economic impacts from wildland fires due to business loss, population displacement, and loss of habitat and recreational opportunities among other things. Wildfire suppression costs can be substantial. The recent Sawmill Fire in Pima County burned over 46,991 acres and costs were estimated at over \$7,300,000.⁶

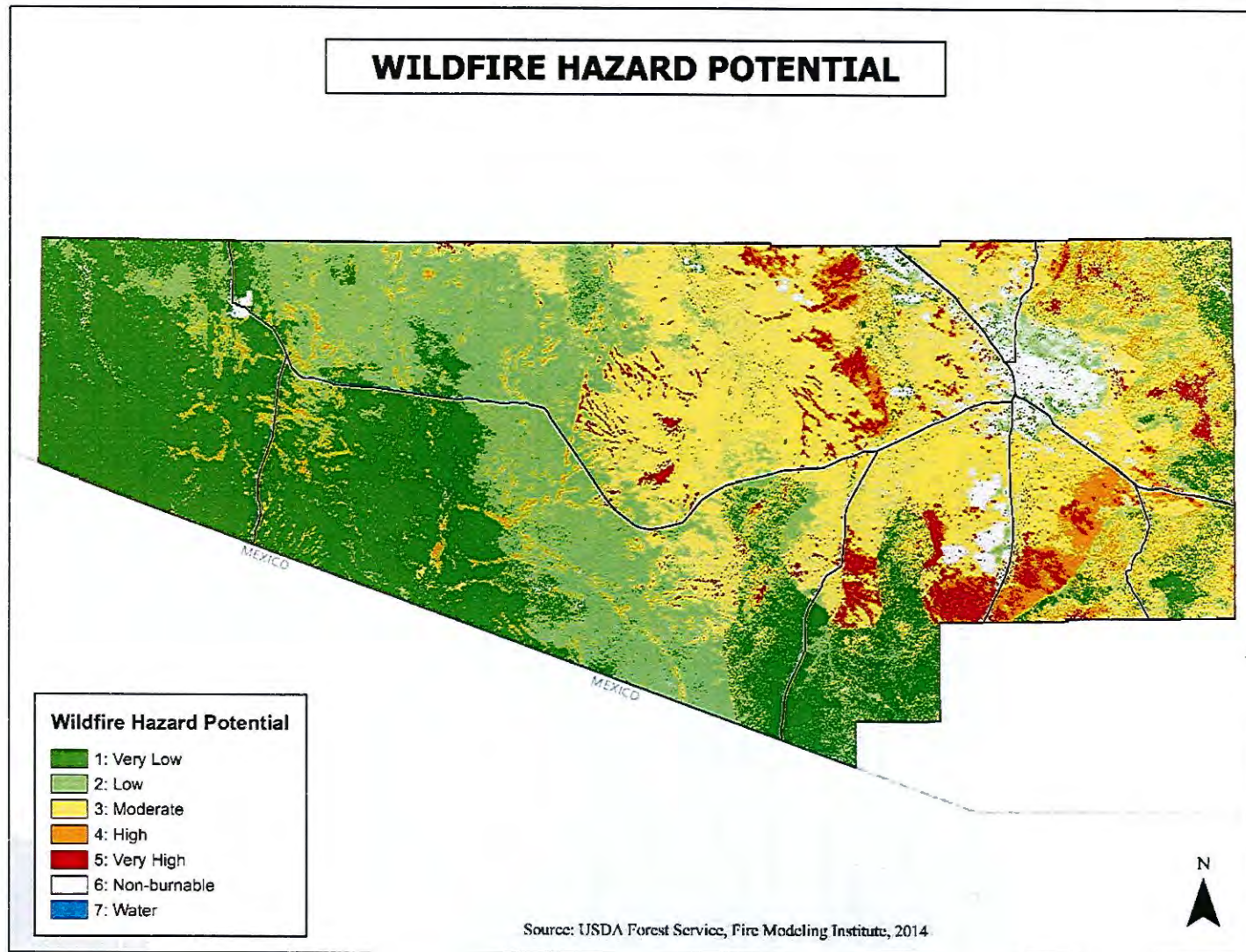
Development Trend Analysis

By its very definition, the Wildland Urban Interface (WUI) represents the fringe of urban development as it intersects with the natural environment. As previously discussed, wildfire risks are significant for a sizeable portion of the county. Any future development will only increase the WUI areas and expand the potential exposure of structures to wildfire hazards. In Pima County, developments tend to create a clear line of demarcation between the wildland fuels and the built environment. The 2013 PCCWPP analyzed community development throughout the county and found a mix of high-density, single-family, and multi-acre parcels. Development of isolated subdivisions or with more dispersed structure development, such as 1 to 3 acre parcels, are at the highest risk.⁷

⁵ Pima County Community Wildfire Protection Plan. (2013). Pima County Office of Emergency Management.
<http://webcms.pima.gov/cms/One.aspx?pageId=45265>

⁶ Sawmill Fire Executive Summary. (May 2, 2017). Southwest Area Incident Management Team#1. <https://sites.google.com/site/swaimtl/>

⁷ Pima County Community Wildfire Protection Plan. (2013). Pima County Office of Emergency Management.
<http://webcms.pima.gov/cms/One.aspx?pageId=45265>



Source: USDA Forest Service, Fire Modeling Institute, 2014
Figure 4-14: Wildfire Hazard Potential Pima County

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SECTION 5: MITIGATION STRATEGY

5.2 Hazard Mitigation Goal and Objectives

The mitigation strategy provides the “what, when, and how” of actions that will reduce or possibly remove the community’s exposure to hazard risks. The three primary components of the mitigation strategy are:

- I. Goals and Objectives (See Section 5.2)
- II. Capability Assessment (See Section 5.3)
- III. Mitigation Actions/Projects and Implementation Strategy (See Section 5.4)

A reassessment of the goals and objectives was made with the planning team at the suggestion of the Arizona State Mitigation Planner. The Team considered the following before revising the goals for 2017:

1. Do the goals and objectives identified in the 2012 Plan reflect the updated risk assessment?
2. Did the goals and objectives identified in the 2012 Plan lead to mitigation projects and changes to policy that helped the jurisdiction(s) to reduce vulnerability?
3. Do the goals and objectives identified in the 2012 Plan support any changes in mitigation priorities?
4. Are the goals and objectives identified in the 2012 Plan reflective of current State goals?

Upon consideration, the goal was simplified and objectives were refined to help focus jurisdictions on true mitigation actions.

Goal

- Reduce or eliminate the risk to people and property from natural hazards.

Objectives

- **Objective 1:** Reduce or eliminate risks that threaten life, critical facilities, and infrastructure.
- **Objective 2:** Promote hazard mitigation activities by increasing public awareness and education of hazards and risks.
- **Objective 3:** Integrate mitigation into planning efforts, capital improvement, grants and funding, multijurisdictional collaboration efforts, and training and exercising.

5.3 Capability Assessment

An important component of the Mitigation Strategy is a review of each participating jurisdictions’ resources in order to identify, evaluate, and enhance the capacity of local resources to mitigate the effects of hazards. The capability assessment is comprised of several components:

- **Legal and Regulatory Review** – a review of the legal and regulatory capabilities, including ordinances, codes, plans, manuals, guidelines, and technical reports that address hazard mitigation activities.
- **Technical Staff and Personnel** – this assessment evaluated and describes the administrative and technical capacity of the jurisdiction’s staff and personnel resources.
- **Fiscal Capability** – this element summarizes each jurisdiction’s fiscal capability to provide the financial resources to implement the mitigation strategy.

The Planning Team reviewed the information provided in the 2012 Plan. The Planning Team chose to keep the format of the tables summarizing the administrative, technical, and fiscal capabilities. Each jurisdiction also has a table to summarize the legal and regulatory capabilities by summarizing and identifying the codes, ordinances, plans, and studies/reports used by the jurisdiction, as well as identify the appropriate agency/department with responsibility for maintaining and updating those documents. Each jurisdiction was asked to update their tables and pare down any unnecessary information. Additionally, each jurisdiction will continually seek out opportunities to be involved with other planning, policy development, or ordinance development that could be beneficial to improving and

implementing mitigation actions. Section 6.3 contains specific jurisdictional actions in the section discussing incorporation into future planning activities.

Jurisdictional Capabilities

Tables 5-1 through 5-19 summarize the legal and regulatory mitigation capability for each participating jurisdiction. Information provided includes a brief listing of current codes, mitigation relevant ordinances, plans, and studies/reports. There are three tables for each jurisdiction summarizing the legal and regulatory capabilities, staff and personnel resources, and the fiscal capability and budgetary tools available to each.

Table 5-1: Pima County Legal and Regulatory Capabilities		
Regulatory Tools for Hazard Mitigation	Description	Responsible Department/Agency
CODES	<ul style="list-style-type: none"> • 2006 International Building, Property Maintenance, Fuel Gas, Plumbing, Mechanical, Energy Conservation, Residential and Wildland-Urban Interface Code • 2005 National Electrical Code 	<ul style="list-style-type: none"> • Development Services • Facilities Management • Department of Environmental Quality • Natural Resources, Parks & Recreation
ORDINANCES	<ul style="list-style-type: none"> • Pima County Code of Ordinances <ul style="list-style-type: none"> • Title 7, Environmental Quality • Title 8, Health & Safety • Title 9, Public Peace, Morals & Welfare • Title 15, Buildings & Construction • Title 16, Floodplain and Erosion Hazard Management Ordinance (2010) • Title 17, Air Quality Control • Title 18, Zoning 	<ul style="list-style-type: none"> • Facilities Management • Wastewater Management • Department of Environmental Quality • Regional Flood Control District • Health Department
PLANS, MANUALS, and GUIDELINES	<ul style="list-style-type: none"> • Pima County Hazard Mitigation Plan (2012) • Stormwater Detention/Retention Manual (1984) • Pima County Community Wildfire Protection Plan (2013) • Drainage and Channel Design Standards for Local Drainage Manual (1984) • Technical Policies (Interpretation of the Title 16 and Other Regulatory Documents) • Sonoran Desert Conservation Plan (2011) • Pima County Sustainability Program • Pima County Comprehensive Plan (2015) • Pima County Drought Response Plan and Water Wasting Ordinance (2014 Amended) 	<ul style="list-style-type: none"> • Development Services • Regional Flood Control District
STUDIES	<ul style="list-style-type: none"> • 1999 Flood Insurance Study, Pima County Unincorporated Areas • FEMA DFIRM Maps (FEMA, Effective date of June 2011) 	<ul style="list-style-type: none"> • Pima County Regional Flood Control District

Regulatory Tools for Hazard Mitigation	Description	Responsible Department/Agency
	<ul style="list-style-type: none"> Special Floodplain Studies available at Pima County Floodplain Studies 	

Staff/Personnel Resources	<input checked="" type="checkbox"/>	Department/Agency - Position
Planner(s) or engineer(s) with knowledge of land development and land management practices	<input checked="" type="checkbox"/>	Development Services, Department of Transportation (PCDOT), Regional Flood Control District (PCRFCD), Wastewater, Solid Waste, Natural Resources and Parks
Engineer(s) or professional(s) trained in construction practices related to buildings and infrastructure	<input checked="" type="checkbox"/>	Development Services, PCDOT, Wastewater
Planner(s) or engineer(s) with and understanding of natural and human-caused hazards	<input checked="" type="checkbox"/>	Development Services, PCDOT, PCRFCD, Wastewater, Natural Resources and Parks, Health Department
Floodplain Manager	<input checked="" type="checkbox"/>	PCRFCD, Development Services
Surveyors	<input checked="" type="checkbox"/>	PCDOT, PCRFCD, Natural Resources and Parks
Staff with education or expertise to assess the community's vulnerability to hazards	<input checked="" type="checkbox"/>	Development Services, PCDOT, Facilities Management, Health Department, Community Services, Sheriff's Department, Natural Resources and Parks, Risk Management, PCRFCD
Personnel skilled in GIS and HAZUS	<input checked="" type="checkbox"/>	Development Services, PCDOT, PCRFCD, Wastewater, Facilities Management, Sheriff's Department, Natural Resources and Parks, Information Technology
Scientists familiar with the hazards of the community	<input checked="" type="checkbox"/>	Health Department, Wastewater, Medical Examiner, Sheriff's Department
Emergency manager	<input checked="" type="checkbox"/>	Office of Emergency Management (OEM)
Grant writer(s)	<input checked="" type="checkbox"/>	OEM, Development Services, Health Department, Cultural Resources

Financial Resources	Accessible or Eligible to Use (Yes, No, Don't Know)	Comments
Community Development Block Grants	Yes	
Capital Improvements Project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric service	Yes	
Impact fees for homebuyers or new developments/homes	Yes	
Incur debt through general obligation bonds	Yes	
Incur debt through special tax bonds	Yes	

Table 5-4: Marana Legal and Regulatory Capabilities		
Regulatory Tools for Hazard Mitigation	Description	Responsible Department/Agency
CODES	<ul style="list-style-type: none"> • Marana Town Code (date varies by code) • 2016 Land Development Code • 2012 International Building Code with amendments additional IBC Amendments • 2012 International Residential Code with amendments additional IRC Amendments • 2012 International Mechanical Code with amendments • 2012 International Plumbing Code with amendments • 2012 International Energy Conservation Code with amendments • 2012 International Property Maintenance Code with amendments • 2011 National Electrical Code with amendments • 2012 International Fire Code with amendments • 2012 International Fuel Gas Code • 2009 ICC A117-1 – Accessible & Useable Buildings and Facilities 	<ul style="list-style-type: none"> • Building Safety • Planning • Engineering • Fire
ORDINANCES, RESOLUTIONS	<ul style="list-style-type: none"> • Res 2006- 174 – Approving & Authorizing Pima County Multi-Jurisdictional Hazard Mitigation Plan • Res 2016-004, Sub grantee for funding for 2016 Arizona Department of Homeland Security Program Ordinance • Resolution 2012-077 Approval of MOU with Red Cross for preparing for and responding to disasters • Resolution No. 2012-074 Approval of Emergency Operations Plan • Resolution 2014-056 Approval of Pima County Community Wildlife Protection Plan • Resolution 2014-109 Approval of Arizona Mutual Aid Compact 	<ul style="list-style-type: none"> • Legal • Council • Town Manager • Emergency Management Coordinator
PLANS, MANUALS, and GUIDELINES	<ul style="list-style-type: none"> • Town of Marana Emergency Operations Plan 2012 	<ul style="list-style-type: none"> • Emergency Management Coordinator
STUDIES	<ul style="list-style-type: none"> • Applicable Special Floodplain Studies available at Pima County Floodplain Studies 	<ul style="list-style-type: none"> • Pima County Regional Flood Control District

Staff/Personnel Resources	<input checked="" type="checkbox"/>	Department/Agency - Position
Planner(s) or engineer(s) with knowledge of land development and land management practices	<input checked="" type="checkbox"/>	Department of Public Works, Subdivision Engineering Department
Engineer(s) or professional(s) trained in construction practices related to buildings and infrastructure	<input checked="" type="checkbox"/>	Department of Public Works, Manager Construction Mgmt. Div.
Planner(s) or engineer(s) with and understanding of natural and human-caused hazards	<input checked="" type="checkbox"/>	Department of Public Works, Manager Environmental Engineering Div.
Floodplain Manager	<input checked="" type="checkbox"/>	Department of Public Works, Subdivision Engineering Department
Surveyors	<input checked="" type="checkbox"/>	GIS Department
Staff with education or expertise to assess the community's vulnerability to hazards	<input checked="" type="checkbox"/>	Police Department
Personnel skilled in GIS and HAZUS	<input checked="" type="checkbox"/>	GIS Department/GIS Manager and Staff
Scientists familiar with the hazards of the community	<input checked="" type="checkbox"/>	Town Engineer, Water Director, Public Works Director, Planning & Building Director, Fire Marshall
Emergency Management Coordinator	<input checked="" type="checkbox"/>	Police Department
Grant writer(s)	<input checked="" type="checkbox"/>	Community Development

Financial Resources	Accessible or Eligible to Use (Yes, No, Don't Know)	Comments
Community Development Block Grants	Yes	Community Development
Capital Improvements Project funding	Yes	Capital Improvement Program
Authority to levy taxes for specific purposes	Yes	Mayor & Council, Finance Department
Fees for water, sewer, gas, or electric service	Yes	Marana Water Department – Water & Sewer
Impact fees for homebuyers or new developments/homes	Yes	Mayor & Council, Finance Department
Incur debt through general obligation bonds	Yes	Mayor & Council, Finance Department
Incur debt through special tax bonds	Yes	Mayor & Council, Finance Department

Table 5-7: Oro Valley Legal and Regulatory Capabilities		
Regulatory Tools for Hazard Mitigation	Description	Responsible Department/Agency
CODES	<ul style="list-style-type: none"> • 2012 International Building, Residential, Plumbing, Mechanical, Energy Conservation, Property Maintenance, Fire and Gas Code • National Electrical Code (2011) • Americans with Disabilities Act Accessible Guidelines (2010) • Oro Valley Zoning Code, Revised (2016) • Oro Valley Town Code, Chapters 6, 7, 15 & 17 	<ul style="list-style-type: none"> • and Public Works (CDPW)
ORDINANCES	<ul style="list-style-type: none"> • Oro Valley Floodplain and Erosion Hazard Management Ordinance (2005) • Oro Valley Storm Water Management and Discharge Control Ordinance, Article 15-24 (2008) • Environmental Sensitive Lands Regulations, 27.10 • Zoning Code adopted by Ordinance includes: Hillside Development Zone, 24.2; and Airport Environs Zone, 24.8 (2011) 	<ul style="list-style-type: none"> • Golder Ranch Fire District • CDPW
PLANS, MANUALS, and GUIDELINES	<ul style="list-style-type: none"> • US Army Corps of Engineers, Federal Highway Administration, "State Standard 7-98 Watercourse Bank Stabilization" • Pima County Multi-Jurisdictional Hazard Mitigation Plan (2012) • Pima County DOT Stormwater Detention/Retention Manual • Oro Valley General Plan (2016) • Capital Investment Plan (2010) • Oro Valley Subdivision Street Standards • Tucson Design Manual • Drainage Criteria Manual (2010) • Pima County Community Wildfire Protection Plan (2013) • Pima County Navigable Waters and Flood Plains • Oro Valley emergency management plans 	<ul style="list-style-type: none"> • Pima County Regional Flood Control District • Tucson • Golder Ranch • CDPW • Finance • Water Utility
STUDIES	<ul style="list-style-type: none"> • FEMA Flood Plain Maps as updated • FEMA Flood Delineation Studies as updated • Oro Valley Stormwater Utility Drainage and LOMR Studies (Various) • FEMA DFIRM Maps (June 2011) • Applicable Special Floodplain Studies available at <u>Pima County Floodplain Studies</u> 	<ul style="list-style-type: none"> • FEMA • Pima County Regional Flood Control District • CDPW

Staff/Personnel Resources	<input checked="" type="checkbox"/>	Department/Agency - Position
Planner(s) or engineer(s) with knowledge of land development and land management practices	<input checked="" type="checkbox"/>	Community Development and Public Works
Engineer(s) or professional(s) trained in construction practices related to buildings and infrastructure	<input checked="" type="checkbox"/>	Community Development and Public Works
Planner(s) or engineer(s) with and understanding of natural and human-caused hazards	<input checked="" type="checkbox"/>	Community Development and Public Works, Oro Valley Police Department, Water Utility
Floodplain Manager	<input checked="" type="checkbox"/>	Community Development and Public Works
Surveyors		
Staff with education or expertise to assess the community's vulnerability to hazards	<input checked="" type="checkbox"/>	Community Development and Public Works, Oro Valley Police Department, Water Utility
Personnel skilled in GIS and HAZUS	<input checked="" type="checkbox"/>	Community Development and Public Works
Scientists familiar with the hazards of the community		
Emergency manager	<input checked="" type="checkbox"/>	Oro Valley Police Department
Grant writer(s)	<input checked="" type="checkbox"/>	Various departments
Others	<input checked="" type="checkbox"/>	Town staff trained in NIMS and ICS

Financial Resources	Accessible or Eligible to Use (Yes, No, Don't Know)	Comments
Community Development Block Grants	Yes	
Capital Improvements Project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, electric service, and stormwater	Yes	
Impact fees for homebuyers or new developments/homes	Yes	
Incur debt through general obligation bonds	Yes	
Incur debt through special tax bonds	Yes	

Regulatory Tools for Hazard Mitigation	Description	Responsible Department/Agency
CODES	<ul style="list-style-type: none"> • International Building Code – 2012 and revisions and amendments per Tribal Resolution. The 2015 will be adopted as released. • International Fire Code – 2012 and subsequent amendments and revisions • NFPA Standards – current codes and standard and revisions and amendments per Tribal Resolution 	<ul style="list-style-type: none"> • Fire Department • Facilities and Housing Department
ORDINANCES	<ul style="list-style-type: none"> • Zoning Ordinance (similar to Pima County) • Reference county and state ordinances 	<ul style="list-style-type: none"> • Land Department/ Development Services
PLANS, MANUALS, and GUIDELINES	<ul style="list-style-type: none"> • Salt River Wildland Fire Management Plan – 2012 • Pima County Hazard Mitigation Plan – 2012 • Pascua Yaqui Tribe Flood Control Project Plan – 2016 	<ul style="list-style-type: none"> • Fire Department • Land Department/ Development Services
STUDIES	<ul style="list-style-type: none"> • Environmental and Floodplain Studies for new facilities • Endangered Species List study • Applicable Special Floodplain Studies available at <u>Pima County Floodplain Studies</u> 	<ul style="list-style-type: none"> • Land Department/ Development Services • Pima County Regional Flood Control District

Staff/Personnel Resources	<input checked="" type="checkbox"/>	Department/Agency - Position
Planner(s) or engineer(s) with knowledge of land development and land management practices	<input checked="" type="checkbox"/>	Land Department/Development Services -- Director Procurement Department – Construction Manager
Engineer(s) or professional(s) trained in construction practices related to buildings and infrastructure	<input checked="" type="checkbox"/>	Facilities and Housing Department – Director, Inspectors Procurement Department – Construction Manager Outside consultants as needed
Planner(s) or engineer(s) with an understanding of natural and human-caused hazards	<input checked="" type="checkbox"/>	Fire Department – Fire Chief
Surveyors		
Staff with education or expertise to assess the community's vulnerability to hazards	<input checked="" type="checkbox"/>	Health Department – Risk Manager
Personnel skilled in GIS and HAZUS	<input checked="" type="checkbox"/>	Land Department/Development Services – GIS Analyst
Scientists familiar with the hazards of the community	<input checked="" type="checkbox"/>	Outside consultants as needed
Emergency manager	<input checked="" type="checkbox"/>	Police Department – Police Chief
Grant writer(s)	<input checked="" type="checkbox"/>	Tribal Grants/Contracts
Other(s)	<input checked="" type="checkbox"/>	Tribal Public Safety personnel trained in NIMS and ICS, outside consultants

Table 5-12: Pascua Yaqui Tribe Fiscal Capabilities		
Financial Resources	Accessible or Eligible to Use (Yes, No, Don't Know)	Comments
Community Development Block Grants	Yes	
Capital Improvements Project funding	Yes	Developed based on availability of funds. Rolling 5-year basis.
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric service	No	PYT does not have the legal capability to impose fees. These fees are all imposed by non-Tribal utility providers. The Tribe would have the authority to tax these utility service fees, but currently does not.
Impact fees for homebuyers or new developments/homes	No	PYT has the legal capability to impose fees but currently does not.
Incur debt through general obligation bonds	Yes	
Incur debt through special tax bonds	Yes	The Tribe has this capability, but the taxes collected by the Tribe are probably not sufficient, and never will be sufficient, to support bonds based upon those possible tax streams.

Current and past financial sources available to the Tribe for hazard mitigation planning and projects include potential disaster and mitigation funds through FEMA (Public Assistance, HMGP, and PDM funds), programs established through the Indian Self Determination Act (Public Law 93-638), casino and tribal enterprise revenues, and various departmental operation budgets. Other potential sources of funds may include the U.S. Department of Interior (Bureau of Reclamation, Bureau of Indian Affairs, U.S. Geological Survey, Bureau of Land Management), U.S. Army Corps of Engineers, U.S. Housing and Urban Development, U.S. Department of Health and Human Services (Indian Health Service), and the U.S. Department of Agriculture (U.S. Forest Service, Natural Resources Conservation Service), State of Arizona (Governor's Office of Economic Development, Arizona Department of Transportation, Arizona Department of Housing, Arizona Department of Health Services), Pima Association of Governments, and other federal, state and local sources. All grants are tracked through the Grants Department at the Tribe and over 21 departments utilize grant funds of one type or another.

Tribal Pre- and Post-Disaster Hazard Management

In addition to Tables, the Pascua Yaqui Tribe is required to summarize and evaluate pre- and post-disaster hazard management to satisfy the §201.7 Tribal Planning capability assessment requirements. Accordingly, Table 5-3-14 summarizes hazard mitigation and pre- and post-disaster hazard management practices and roles that are currently accomplished through several Pascua Yaqui Tribe departments and programs.

Table 5-13: Mitigation Responsibilities for the Pascua Yaqui Tribe	
Department or Agency	Hazard Mitigation and Disaster Management Activities
Office of the Chairman	<ul style="list-style-type: none"> • General emergency oversight • General development oversight
Tribal Council	<ul style="list-style-type: none"> • Final approval for all pre-disaster planning, projects and funding allocation for pre- and post-disaster hazard management activities.
Land Department	<ul style="list-style-type: none"> • Regulates land use and development including zoning and flood management. • Lead planning department for all tribal development including flood control, transportation, and other physical improvements on the reservation.
Fire Department	<ul style="list-style-type: none"> • Shared emergency management role with Police Department • Emergency response and mitigation responsibilities regarding fire and HazMat. • Hazmat awareness and operations, but not technical response for removal or clean up. • Wildland fire awareness and operations • CERT Team collaboration • Part of the AZ Mutual Aid Compact (AZMAC) • Pima County Fire Chiefs Mutual Aid Agreement • Pima County Community Wildfire Protection Plan • Tribal Salt River Region Fuel Management Plan
Health Department	<ul style="list-style-type: none"> • Control of disease and outbreak incidents • Dispensing of medication and anti-viral vaccines through points of distribution and points of dispensing. • Public awareness and public service announcements in collaboration with the local radio station. • Conduct training for hazard related issues and incidents • CERT Team leadership
Police Department	<ul style="list-style-type: none"> • Shared emergency management role with Fire Department • Response and mitigation for many of the human-caused hazards related to the civil population and terrorism • Enforcement of tribal law • Participates in a regional SWAT team
Facilities Management	<ul style="list-style-type: none"> • Maintain and operate heavy equipment for response to disaster related needs • Maintain electricians on staff • Responsibility for emergency shut-off of water mains • Maintain a 24/7 on-call capability
Procurement Department	<ul style="list-style-type: none"> • Emergency and other purchases • Maintenance of emergency generators
Indian Health Services – Office of Engineering and Environmental Health	<ul style="list-style-type: none"> • Emergency response and post-disaster needs assessments for mitigation and recovery.
BIA	<ul style="list-style-type: none"> • Mutual aid cooperative agreement with PYT for fire response and financial assistance.

The Pascua Yaqui Tribe has several programs and policies in-place to provide for effective hazard mitigation, as is summarized in the applicable tables. For the 2017 Plan, the Tribe pulled together a Local Planning Team consisting of their Facilities, Housing, Enrollment, Health, Law Enforcement, Procurement, and Land Departments and included the Casino CEO. The Tribal Planning Team performed an evaluation/assessment of the information summarized, and noted the following regarding successes, gaps, opportunities and changes over the last plan cycle:

- Regarding pre- and post-disaster hazard management policies, programs, and capabilities, the tribal planning team:
 - Identified the ongoing need for the development and implementation of an emergency response plan.
 - Identified a need for continued resources to respond to a human-caused incident at the AVA entertainment facility and casino.
 - Found that the current mutual aid agreements were proving effective in providing additional response capacity
 - The management of flood related hazards is by far the most prominent hazard mitigation need for the Tribe due to the reservation being wholly situated within a 100-year floodplain and subject to regular flooding. There is a serious need for flood control related funding and projects.
- There has been no significant change in the Tribe's policies related to development in hazard prone areas over the 2012 Plan cycle other than to regulate to the 100-year floodplain using the data and recommendations of the Pascua Yaqui Tribe Flood Control Project.
- Specific hazard management capabilities of the tribe that have changed since approval of the previous plan include:
 - New BIA, Pima Fire Chiefs, Pima County Wildfire Protection Plan, Arizona Mutual Aid Compact and SWAT cooperative/mutual aid agreements have been developed.
 - The Pascua Yaqui Tribe Flood Control Project Plan became available for flood management use. The plan is delivered in phases with completion of phase 2 concluding in October 2016 and activities will continue.
 - CERT team collaboration.

Upon receipt of a presidential disaster declaration, the Tribe will work with FEMA to develop two (2) post-disaster hazard management tools:

- 1) Public Assistance Administration Plan; and
- 2) Hazard Mitigation Grant Program Administration Plan. Both plans will be used by the Tribe to identify the roles and responsibilities of the Tribe in administering the FEMA Public Assistance (PA) and Hazard Mitigation Grant Programs (HMGP), and to outline staffing requirements and the policies and procedures to be used. As result of developing these plans and revising this Plan, Tribal resources will improve hazard management and mitigation planning.

Regulatory Tools for Hazard Mitigation	Description	Responsible Department/Agency
CODES	<ul style="list-style-type: none"> Sahuarita Town Code, as amended 2012 Series of International Codes (Chapter 15.05 of the Town Code), as amended 2011 National Electric Code, as amended 	<ul style="list-style-type: none"> Planning & Building Safety Police Public Works Green Valley Fire District Rural/Metro Fire District
ORDINANCES	<ul style="list-style-type: none"> Floodplain Management Ordinance, as amended Aquifer Protection permit #103602 	<ul style="list-style-type: none"> Public Works Water Reclamation
PLANS, MANUALS, and GUIDELINES	<ul style="list-style-type: none"> Pima County Hazard Mitigation Plan (2012) Lee Moore Wash Basin Management, as amended Town of Sahuarita General Plan (2015) Specific Development Plans <ul style="list-style-type: none"> Madera Highlands La Joya Verde Quail Creek Sahuarita Farms Rancho Sahuarita Strategic Plan for Economic Development (2009) Strategic Plan, as amended Capital Improvement Plan (5-Year Rolling Plan Updated Annually) Strategic Plan for Emergency Preparedness 2011 	<ul style="list-style-type: none"> Planning & Building Safety Public Works Police Department
STUDIES	<ul style="list-style-type: none"> Applicable Special Floodplain Studies available at Pima County Floodplain Studies 	<ul style="list-style-type: none"> Pima County Regional Flood Control District

Staff/Personnel Resources	<input checked="" type="checkbox"/>	Department/Agency - Position
Planner(s) or engineer(s) with knowledge of land development and land management practices	<input checked="" type="checkbox"/>	Public Works Director, Planning Director, Building Official
Engineer(s) or professional(s) trained in construction practices related to buildings and infrastructure	<input checked="" type="checkbox"/>	Public Works Director, Building Official
Planner(s) or engineer(s) with and understanding of natural and human-caused hazards	<input checked="" type="checkbox"/>	Public Works Director, Planning Director, Building Official
Floodplain Manager	<input checked="" type="checkbox"/>	Public Works Director
Surveyors	<input checked="" type="checkbox"/>	Contract firm
Staff with education or expertise to assess the community's vulnerability to hazards	<input checked="" type="checkbox"/>	Public Works Director, Planning & Building Director, Police Chief

Staff/Personnel Resources	<input checked="" type="checkbox"/>	Department/Agency - Position
Personnel skilled in GIS and HAZUS	<input checked="" type="checkbox"/>	Contract Firm for Planning and Public Works Department
Scientists familiar with the hazards of the community	<input checked="" type="checkbox"/>	Public Works Director, Planning & Building Director, Fire Marshall
Emergency manager	<input checked="" type="checkbox"/>	Police Department
Grant writer(s)	<input checked="" type="checkbox"/>	Police Department, Public Works, Parks and Recreation Department, Office of the Town Manager

Financial Resources	Accessible or Eligible to Use (Yes, No, Don't Know)	Comments
Community Development Block Grants	Yes	
Capital Improvements Project funding	Yes	Multi-year CIP Program
Authority to levy taxes for specific purposes	Yes	None
Fees for water, sewer, gas, or electric service	Yes	Sewer connection/hook-up fees, no other for Town
Impact fees for homebuyers or new developments/homes	Yes	None, see "other" below
Incur debt through general obligation bonds	Yes	Only when necessary
Incur debt through special tax bonds	Yes	None
Other/Construction Sales Tax	Yes	Levied for each new home built in community

Regulatory Tools for Hazard Mitigation	Description	Responsible Department/Agency
CODES	<ul style="list-style-type: none"> • 2012 International Building Code amendments (w/la) • 2011 National Electrical Code (w/la) • Amendments to the 2012 International Energy Conservation Code (w/la) • Amendments to the 2012 International Existing Building Code (w/la) • Amendments to the 2012 International Fuel Gas Code (w/la) • Amendments to the 2012 International Mechanical Code (w/la) • Amendments to the 2012 International Plumbing Code (w/la) • Amendments to the 2012 International Residential Code (w/la) • Amendments to the 2012 International Fire Code (w/la) • City of Tucson/Pima County Outdoor Lighting Code • Tucson Unified Development Code (UDC) 	<ul style="list-style-type: none"> • Planning and Development Services

Table 5-17: Tucson Legal and Regulatory Capabilities		
Regulatory Tools for Hazard Mitigation	Description	Responsible Department/Agency
ORDINANCES	<ul style="list-style-type: none"> Tucson Code of Ordinance (date varies by ordinance) 	<ul style="list-style-type: none"> City Manager
PLANS, MANUALS, and GUIDELINES	<ul style="list-style-type: none"> Pima County Multi-Jurisdictional Hazard Mitigation Plan (2012) “Plan Tucson”, the City of Tucson General & Sustainability Plan (2013) Tucson Emergency Operations Plan (2014) Design Standards Manual for Water (2005) National Flood Insurance Program (NFIP) Regulations Pima Association of Governments (PAG) Standard Specifications and Details for Public Improvements (2014) Third-party Plan Review Policies and Standards available online, date varies Tucson Climate Mitigation Report (2011) 	<ul style="list-style-type: none"> City Manager COT Office of Emergency Mgt. & Homeland Security Pima County OEM Tucson Water Tucson Fire Pima Association of Gov’ts Office of Integrated Planning Various Departments
STUDIES	<ul style="list-style-type: none"> FEMA DFIRM Maps (September, 2012) • Flood Insurance Studies (FIS) Tucson Climate Impact Study (2012) Applicable Special Floodplain Studies available at <u>Pima County Floodplain Studies</u> 	<ul style="list-style-type: none"> Planning and Development Services Parks & Recreation Office of Integrated Planning

Table 5-18: Tucson Technical Staff and Personnel Capabilities		
Staff/Personnel Resources	<input checked="" type="checkbox"/>	Department/Agency - Position
Planner(s) or engineer(s) with knowledge of land development and land management practices	<input checked="" type="checkbox"/>	Planning Department – Principal Planner, Planner II, Planner III Water Services – Superintendents, Project Engineers, Civil Engineers, Project Coordinators, Principal Engineering Technicians, Principal Planners
Engineer(s) or professional(s) trained in construction practices related to buildings and infrastructure	<input checked="" type="checkbox"/>	Street Transportation Department - Civil Engineers Water Services – Superintendents, Civil Engineers, Project Coordinators, Principal Engineering Technicians
Planner(s) or engineer(s) with and understanding of natural and human-caused hazards	<input checked="" type="checkbox"/>	Planning Department – Principal Planner, Planner II, Planner III Water Services – Superintendents, Civil Engineers, Principal Engineering Technician, Hydrologist
Floodplain Manager	<input checked="" type="checkbox"/>	Street Transportation Department - Civil Engineer III
Surveyors	<input checked="" type="checkbox"/>	Street Transportation Department – Survey Teams
Staff with education or expertise to assess the community’s vulnerability to hazards	<input checked="" type="checkbox"/>	Water Services – Environmental Programs Coordinator, Civil Engineers, Water Quality Inspectors

Table 5-18: Tucson Technical Staff and Personnel Capabilities		
Staff/Personnel Resources	<input checked="" type="checkbox"/>	Department/Agency - Position
Personnel skilled in GIS and HAZUS	<input checked="" type="checkbox"/>	Information Technology Services – Info Tech Analyst/Programmers and Info Tech Specialists Fire Department – Fire Protection Engineer Police Department – Senior User Technology Specialist Street Transportation Department - Info Tech Analyst/Programmer II and Senior GIS Technician Water Services Department – GIS and Senior GIS Technicians
Scientists familiar with the hazards of the community	<input checked="" type="checkbox"/>	Office of Environmental Programs – Environmental Quality Specialists Water Services – Chemists, Environmental Quality Specialist, Laboratory Technician, Environmental Programs Coordinator
Emergency manager	<input checked="" type="checkbox"/>	Tucson Office of Emergency Management
Grant writer(s)	<input checked="" type="checkbox"/>	Fire Department – Fire Captains and Grant Manager Planning Department – Principal Planner, Planner II, Planner III Police Department – Police Research Analysts Public Transit, Division of Transportation

Table 5-19: Tucson Fiscal Capabilities		
Financial Resources	Accessible or Eligible to Use (Yes, No, Don't Know)	Comments
Community Development Block Grants	Yes	Housing, Community Services, and Water Services projects
Capital Improvements Project funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric service	Yes	Water and Solid Waste Fees
Impact fees for homebuyers or new developments/homes	Yes	For new developments inside impact fee areas-zones only. The Impact Fees are charged to new developments.
Incur debt through general obligation bonds	Yes	This excludes the Water Department
Incur debt through special tax bonds	Yes	Excise (sales) taxes

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5.4 Mitigation Actions/Projects

Mitigation actions/projects (APs) are those activities identified by a jurisdiction, that when implemented, will have the effect of reducing the community’s exposure and risk to the particular hazard or hazards being mitigated. The implementation strategy addresses the “*how, when, and by whom?*” questions related to implementing an identified AP. APs should be measurable and mitigation-based. Response or recovery activities were removed from the 2017 plan as they are better addressed in county and local jurisdictional operational plans.

The process for defining the list of mitigation APs for the Plan was accomplished in three steps. First, an assessment of the actions and projects specified in the 2012 plan was performed. Second, a new list of APs for the Plan was developed by combining the carry forward results from the assessment with new APs. Third, an implementation strategy for the combined list of APs was formulated.

Previous Mitigation Actions/Projects Assessment

The Planning Team and Local Planning Team for each jurisdiction reviewed and assessed the actions and projects listed in the Mitigation Strategy section of the 2012 Plan. The assessment included evaluating and classifying each of the previously identified APs based on the following criteria:

Status		Disposition	
Classification	Explanation Requirement:	Classification	Explanation Requirement:
“No Action”	Reason for no progress	“Keep”	None required
“In Progress”	What progress has been made	“Revise”	Revised components
“Complete”	Date of completion and final cost of project (if applicable)	“Delete”	Reason(s) for exclusion.

Any AP with a disposition classification of “Keep” or “Revise” was carried forward to become part of the AP list for the 2017 Plan. All APs identified as “Delete” were removed and are not carried forward in this Plan. The results of the assessment for each of the 2012 Plan APs is summarized by jurisdiction in Appendix C.

New Mitigation Actions

Upon completion of the assessment, each jurisdiction’s Local Planning Team developed new APs using the 2017 goals and objectives, results of the vulnerability analysis and capability assessment, and the planning team’s institutional knowledge of hazard mitigation needs in the community.

The APs can be generally classified as either structural or non-structural. Structural APs typify a traditional “brick and mortar” approach where physical improvements are provided to effect the mitigation goals. Examples may include forest thinning, channels, culverts, bridges, detention basins, dams, emergency structures, and structural augmentations of existing facilities. Non-structural APs deal more with policy, ordinance, regulation and administrative actions or changes, buy-out programs, and legislative actions.

For each AP, the following elements were identified:

- **Description** – a brief description of the AP including a supporting statement that tells the “what” and “why” reason for the AP.
- **Hazard(s) Mitigated** – a list of the hazard or hazards mitigated by the AP.
- **Community Assets Mitigated** – Existing, new or both.
- **Estimated Cost** – concept level cost estimates that may be a dollar amount or estimated as staff time.
- **Anticipated Completion Date** – a realistic and general timeframe for completing the AP. Examples may include a specific target date, a timeframe contingent upon other processes, or recurring timeframes.
- **Lead Agency** – the agency, department, office, or other entity and corresponding job title that will have responsibility for the AP and its implementation.
- **Potential Funding Source** – the source or sources of anticipated funding for the AP.

- **Priority Ranking** – each AP was assigned a priority ranking of either “High”, “Medium”, or “Low”. The assignments were subjectively made using a simple process that assessed how well the AP satisfied the following considerations:
 - A favorable benefit versus cost evaluation, wherein the perceived direct and indirect benefits outweighed the project cost.
 - A direct beneficial impact on the ability to protect life and property from natural hazards.
 - A mitigation solution with long-term effectiveness

Tables 5-20 through 5-25 summarize the current mitigation AP and implementation strategy for each participating Plan jurisdiction

Table 5-20: 2017 Mitigation Measures for Unincorporated Pima County

Mitigation Action/Project				Implementation Strategy				
Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Priority Ranking	Planning Mechanism(s) for Implementation	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
Enforce Flood & Erosion Hazard Ordinance in accordance with the NFIP.	Flood	Both	\$1.2 million	High	Regulatory	Ongoing	PCRFCFD / Floodplain Management Division	Flood Control Tax Levy
Implement NFIP tasks such as LOMR submittals, maintaining a countywide map repository, performing master drainage studies, and coordinating to ensure the digital map is correct.	Flood	Both	\$600,000	High	Regulatory	Ongoing	PCRFCFD / Planning & Development Division	Flood Control Tax Levy
Provide flood risk mitigation through Capital Improvement Projects (CIP).	Flood	Both	\$4.0 million	High	Capital Improvement	Ongoing	PCRDFD / Planning & Development Division	Flood Control Tax Levy & USACOE
Participate in Community Rating System to reduce insurance premiums.	Flood	Both	\$50,000	Medium	N/A	Ongoing	PCRFCFD / Planning & Development Division	Flood Control Tax Levy
Buffelgrass Mitigation – identify public outreach opportunities including pamphlets, community event participation, media outreach.	Wildfire	Both	\$5,000	High	Community Wildfire Protection Plan	Ongoing	PCOEM, Natural Resources, Parks & Recreation	Mitigation Grants, General Funds, Donation
Buffelgrass Mitigation – locate county areas for mitigation of buffelgrass and administer grant funding for ongoing activities related to wildfire reduction through removal and reduction in Buffelgrass.	Wildfire	Both	\$3,000,000	Medium	Community Wildfire Protection Plan	Ongoing	PCOEM, Natural Resources, Parks & Recreation	Mitigation Grants

Table 5-20: 2017 Mitigation Measures for Unincorporated Pima County

Mitigation Action/Project				Implementation Strategy				
Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Priority Ranking	Planning Mechanism(s) for Implementation	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
Treat soil surfaces with appropriate stabilization materials and vegetation control to reduce blowing dust.	Severe Wind	Both	\$2,000,000	Medium	Road Design Manual	Ongoing	PCDOT	Highway User Revenue Funds, Local Regional Transportation Authority Funds
Continue to identify vulnerable populations for heat related illness, provide education targeted toward recreational activities, visitors/travelers, hospitality industry, homeless populations, and build cooling center capacity.	Extreme Heat	Both	\$100,000	High	Heat Adaptation and Mitigation Plan	Ongoing	PCHD, PCOEM, Parks & Recreation	Mitigation Grants, Public Health Emergency Preparedness
Implement the Drought Management Plan. If drought conditions worsen, the Board of Supervisors may consider increasing the drought stage that will trigger drought conservation measures.	Drought	Both	None	Medium	Drought Management Plan and Water Wasting Ordinance	Ongoing	OSC/Water Resources Unit	General fund and RWRD enterprise fund
Pima County DOT in conjunction with the Arizona Geological Survey and the US Forest Service will work to identify vulnerable slide areas and begin developing mitigation approaches and monitoring protocols.	Landslide	Existing	Staff Time	Medium	Road Clearing and Slope Stabilization and Dressing Procedures	Ongoing	PCDOT	Highway User Revenue Funds, Mitigation Funds, Bond Fund, Aid to Federal Highways

Table 5-21: 2017 Mitigation Measures for Marana

Mitigation Action/Project				Implementation Strategy				
Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Priority Ranking	Planning Mechanism(s) for Implementation	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
Provide training to the applicable Marana departments on the adopted hazard mitigation plan and its requirements.	All	Both	\$500	High	Town wide Emergency Management Program	2021	Emergency Management Coordinator	General Fund
Conduct public education campaigns to increase awareness of natural hazards (such as wildfire, flooding, extreme heat and cold, and severe winds and landslides) by distributing DEMA and Pima County hazard awareness flyers at community events and public gathering opportunities. Event opportunities include events such as the Town of Marana Founders Day (Mar), the 4 th of July Celebration (Jul), the Cotton Festival (Oct) and the Holiday Tree Lighting (Dec) and at community meetings sponsored by the Community Services Department.	All	Both	\$500	High	Town wide Emergency Management Program	2021	Community Development Director	General Fund
Encourage bridge or culvert construction where roads are susceptible to flooding. This will be accomplished as part of the Planning Process when Developers apply to build in Marana.	Flood	Both	Staff Time	High	Regulatory	2017 and 2018	Development Services/ General Manager	General Fund

Table 5-21: 2017 Mitigation Measures for Marana

Mitigation Action/Project				Implementation Strategy				
Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Priority Ranking	Planning Mechanism(s) for Implementation	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
Marana will continue to participate in the National Flood Insurance Program by reviewing applications for buildings, ensuring they are properly designed.	Flood	Both	Staff Time	High	Town wide Emergency Management Program	8	Development Services/ General Manager	General Fund
On Rattlesnake Pass, from Saguaro Bloom to Twin Peaks Road, the Public Works Department and Planning Departments are installing infrastructure, making roadway drainage improvements and grading the storm water conveyance systems to mitigate flooding hazards in the area.	Flood	Both	\$29.8 Million	High	Town wide Emergency Management Program	2018	Public Works / Planning Department	Transportation Fund, General Fund
Barnett Linear Park and Flood Control – Construct a 3-mile channel along Barnett Road to mitigate the drainage and flood hazard from the Santa Cruz River	Flood	Both	\$16.5 Million	High	Regulatory	2017 work begins	Public Works / Director	General Fund, Future MMPC Bonds
Ina Road Bridge – Remove and replace the Ina Road bridge that crosses the Santa Cruz River	Flood	New	\$17.5 Million	High	Departmental Plan	Dependent on funding and planning cycle	Development Services / Director	Transportation Fund, HURF Bonds, General Fund
Ina Road Improvements from Silverbell Road to I-10 – widening of Ina Road to 4-lane section with raised median, sidewalks, and drainage improvements	Flood	Both	\$16.5 Million	High	CIP	2016 work began	Public Works/Director	Transportation Fund, Federal Grants

Table 5-21: 2017 Mitigation Measures for Marana

Mitigation Action/Project				Implementation Strategy				
Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Priority Ranking	Planning Mechanism(s) for Implementation	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
Tangerine Road Corridor - provide a minimum of 4 lanes with raised medians, drainage improvements, sidewalks, ADA facilities, multi-use path and lanes, Traffic Signals, Right-of-Way acquisitions, Utility relocations, Marana Water line extensions, and sewer modifications and additions.	Flood	Both	\$95.5 Million	High	CIP	2019	Public Works / Director	RTA, Future Bond Money
Ina Road TI – lower I-10 and construct a new overpass that will span both I-10 and the UPRR tracks. Project will mitigate flood issues and also improve access that will reduce accidents and HazMat incidents	Flood	New	\$65.0 Million	High	CIP	2018	Public Works / Director in coordination with ADOT	ADOT, RTA
Marana will continue to participate in the Flood Prone Land Acquisition Program and acquire properties located in flood hazard areas.	Flood	Both	Staff	High	CIP	Ongoing	Development Services/ General Manager	Grants, Partnership w/ Pima County

Table 5-22: 2017 Mitigation Measures for Oro Valley

Mitigation Action/Project				Implementation Strategy				
Description	Hazard(s)) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Priority Ranking	Planning Mechanism(s) for Implementation	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
Conduct Floodplain Mapping to mitigate flood risk by delineating floodplains boundaries within existing subdivisions that were not required at the time of subdivision or commercial property platting. This includes subdivisions and commercial properties constructed prior to 1984 and falls within some recently annexed areas of the Town. This includes three projects: Carmack Wash/Shadow Mountain Estates subdivision, Peglar Wash/Suffolk Hills Subdivision/Rancho Catalina Subdivision, Highlands Wash/Highlands subdivision.	Flood	Existing Homes / Subdivisions/ Commercial Properties	\$200K	High	Stormwater Utility CIP	July 2018	Town of Oro Valley Stormwater Utility	PCRFCDCIP
Mitigate and stabilize areas damaged by storm related activity by: Designing and constructing of wash stabilization components to protect damaged areas from scour and deposition of sediment that is causing damage to existing properties. This includes three projects: 3 known projects: Carmack Wash/Shadow Mountain Estates subdivision, Peglar Wash/Suffolk Hills Subdivision/Rancho Catalina Subdivision, Highlands Wash/Highlands subdivision.	Flood	Existing Homes / Subdivisions/ Commercial properties	\$1M-2M/	High	Stormwater Utility CIP	July 2019	Town of Oro Valley Stormwater Utility	PCRFCDCIP

Table 5-22: 2017 Mitigation Measures for Oro Valley

Mitigation Action/Project				Implementation Strategy				
Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Priority Ranking	Planning Mechanism(s) for Implementation	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
Lambert Lane (Rancho Sonora to La Canada). All weather crossing, lowering hill profile and adding soil nail walls. Upgrading signal at Lambert Lane. Adding secondary access point to fire station from Lambert, currently only accessible from La Canada Dr.	Flood	Existing road improvement	\$5.5 Million (Road) \$730,000 (Utility)	High	20 Year RTA Plan	September 2017	Town of Oro Valley Stormwater Utility	RTA, Water Utility, Town of Oro Valley
Tangerine Rd. (Oro Valley portion of project is Shannon to La Canada). All weather crossings, multi-use path, raised medians, curb and gutters, traffic signal improvement at La Cholla and Tangerine.	Flood	Existing road improvement	\$95.5 Million (Total Tangerine Project)	High	20 Year RTA Plan	May 2018	Town of Marana	RTA, Town of Marana, Pima County, and Town of Oro Valley
La Cholla (Oro Valley portion of project is Lucero Rd. to Tangerine). 4 lane divided with a raised median, separated multi-use path, all weather crossings. Traffic signal improvement at Lambert, Naranja, and Glover.	Flood	Existing road improvement	\$20 Million	High	20 Year RTA Plan	2020	Town of Oro Valley	RTA, Pima County, and Town of Oro Valley
Purchase 2,000 acre-ft. of groundwater extinguishment credits in the Tucson Active Management Area (TAMA) to bolster the Town's groundwater allowance account for future use.	Drought	New	\$400,000	Medium	Water Utility CIP	June 31, 2017	Water Utility	Water Utility Fees

Table 5-22: 2017 Mitigation Measures for Oro Valley

Mitigation Action/Project				Implementation Strategy				
Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Priority Ranking	Planning Mechanism(s) for Implementation	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
Remove regulatory barriers and develop programs that support sustainable designs, landscapes, green infrastructure, and development practices. Update and develop new building codes and design standards that help reduce urban heat island effect.	Extreme Heat	Both	Staff Time \$3,750 per year	Low	General Plan 2016	2021	CDPW	Town of Oro Valley
Installation of hydrants in urban interface area targeting areas where there is a higher risk for brush fire.	Wildfire	New	\$21,000 per year	Medium	Mountain Vista Fire District CIP	2021	Mountain Vista Fire District	MVFD general fund
Annual maintenance on established and identified as critical fire break locations in the urban/wildland interface (Catalina State Park, Sun City Oro Valley, etc.).	Wildfire	Both	\$10,000 per year	Medium	Golder Ranch Fire District	October 2021	Golder Ranch Fire District	Golder Ranch Fire District
Provide annual, public awareness and public outreach on local hazards, mitigation, prevention, plans, and other activities through presentations to homeowners and HOAs, newsletters, and website.	All	Both	\$500 per year	Medium	Town-wide emergency management program	2021	Emergency Management & Golder Ranch Fire District	Town of Oro Valley & Golder Ranch Fire District
Mitigate and stabilize areas damaged by storm related activity in the Catalina Ridge Drainage Channel by reconstructing 3,400 linear feet of channel bottom, improve wash degradation, and mitigate side slope to protect public and private property, public infrastructure and utilities from additional damage.	Flood	Existing	\$1.9 Million.	High	Stormwater Utility CIP	2021	Town of Oro Valley Stormwater Utility	PCRFC D CIP, TOV, FEMA

Mitigation Action/Project				Implementation Strategy				
Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Priority Ranking	Planning Mechanism(s) for Implementation	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
The Pascua Yaqui Tribes Master Drainage Report overseen by Facilities Management Division will be implemented within phases <ul style="list-style-type: none"> • Oversee floodplain modeling • Review floodplain map revision • Assessments of flooding runoff in public gathering areas 	Flood	Existing	Staff time	Medium	Continued Implementation of Regional Flood Control Project	Ongoing and Continuous	Tribal Council, Facilities Department, Land Department	General Fund
Complete and implement Phase 2 finalization of Master Drainage Report.	Flood	Existing	Staff time	Medium	Continued Implementation of Regional Flood Control Project	November, 2017	Tribal Council, Land Department	General Fund
Update and resume the existing intergovernmental agreement between the Tribe and the State Forestry Department. Conduct Annual maintenance on established and identified critical fire break locations in the urban/wildland interface around all housing, neighborhoods projects and commercial buildings on the Pascua Yaqui Reservation.	Wildfire	Existing	Staff time	High	Continue Wildland Urban Inference	Continuing	Fire Department, Attorney General's Office, Tribal Council	General Fund
Modify and continue to evaluate existing building codes to help mitigate hazards. <ul style="list-style-type: none"> • Evaluate material and installation of equipment to buildings and residence • Educate community on hazard via website, department brochures 	Extreme Heat	Existing	Staff Time	High	Continued code enforcement by Housing Division for new and remolded construction projects	Ongoing and Continuous	Tribal Council, Fire Department, Land Department, Housing/Facilities Department	General Fund

Table 5-24: 2017 Mitigation Measures for Sahuarita

Mitigation Action/Project				Implementation Strategy				
Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Priority Ranking	Planning Mechanism(s) for Implementation	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
Complete Multi-Sector General Permit (Wastewater facility) inspections and perform maintenance and repairs of control measures as identified during inspections.	Flood	Existing	Staff Time	High	Maintenance and Inspection	Quarterly	Public Works - Wastewater	Enterprise
Organize and host annual Southern Arizona Beat Back Buffelgrass community removal event.	Wildfire	Both	Staff Time	Medium	Community Wildfire Protection Program	Annual (typically January)	Public Works, Planning and Zoning	None
Review, update and modify NFIP requirement and make appropriate modifications to Floodplain Ordinance.	Flood	Both	Staff Time	High	Regulatory	2017	Public Works	General Fund
Educate the public to increase awareness of hazards, and potential opportunities for mitigation actions. Make Pima County's public information material sheets, websites, mitigation brochures, and media outlets available.	Extreme Heat, Flood	Both	Staff Time	Low	Public Information Program	Dec 2018	Town Clerk	None
Conduct pre-storm season inspections and debris removal for Town-owned roads and drainage crossings.	Flood	Existing	Staff Time	High	Maintenance	Ongoing, pre-Monsoon	Public Works	HURF
Complete construction of Sahuarita Road: Interstate-19 to Eastern Town Limits including drainage improvements and a new 2-lane bridge over the Santa Cruz River.	Flood	Both	\$47.7M	High	General Plan	Planning began in 2016	Public Works	RTA, HURF, private

Table 5-24: 2017 Mitigation Measures for Sahuarita

Mitigation Action/Project				Implementation Strategy				
Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Priority Ranking	Planning Mechanism(s) for Implementation	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
Complete construction of the Pima Mine Road Bridge Replacement at the Santa Cruz River, which corrects structural deficiencies of the existing bridge, provides additional roadway capacity at the bridge, and provides additional capacity for delivery of CAP water to Sahuarita.	Flood, Drought	Both	\$7.2M	High	General Plan	Planning began in December 2016	Public Works	RTA, HURF, private
Finalize License Agreements allowing installation of CAP pipelines in Town rights-of-way to facilitate the delivery of CAP water to Sahuarita.	Drought, Extreme Heat, Flood	Both	Staff Time	High	General Plan	2017	Public Works	None

Table 5-25: 2017 Mitigation Measures for Tucson

Mitigation Action/Project				Implementation Strategy				
Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Priority Ranking	Planning Mechanism(s) for Implementation	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
Identify funding source and construct two bridges and 50 box culverts with 380 back-up power units for signalized intersections at high flood hazard crossings in Tucson limits in accord with the Department of Transportation 5-yr plan. If a box culvert cannot be constructed an automated warning device, consisting of a barricade, signs and flashing lights would be installed.	Flood, Severe Wind	New	\$100 million, Staff Time	High	Tucson Floodplain Management Plan and Floodplain Ordinances	Ongoing effort with long-term horizon. Schedule dependent upon funding	Transportation Department Streets Administrator and Streets Chief Engineer	Grant Funds
Promote disaster-resistant water delivery system by constructing redundant water transmission lines (e.g., The Utility and the community will be less susceptible to loss of water delivery due to natural or human-caused disasters).	All	Both	\$7.9 million	High	Tucson Water 2020 strategic plan.	On-going with full completion by 2020	Water Department / Water Administrator Maintenance & Operations	Operations Budget

Table 5-25: 2017 Mitigation Measures for Tucson

Mitigation Action/Project				Implementation Strategy				
Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Priority Ranking	Planning Mechanism(s) for Implementation	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
In compliance with the NFIP, Tucson will continue to require the preparation and submittal of a CLOMR or CLOMR-F for all proposed development within FEMA delineated Special Flood Hazard Areas	Flood	Existing	Staff Time	High	Regulatory	Annual - Ongoing	Planning and Development Services	Department Budget and Fees for Developers
Maintain compliance with NFIP regulations by enforcement of the current floodplain management ordinance through review of new development located in the floodplain and issuance of floodplain use permits.	Flood	Existing	Staff Time	High	Regulatory	Annual - Ongoing	Planning and Development Services	Department Budget
Improve floodplain administration under the NFIP program by sending inspectors into the field when we receive a flood warning from the NWS , to assess bridges, washes and other critical infrastructures within Tucson.	Flood	Existing	Staff Time	Medium	Tucson Department of Transportation "Operation Splash" and regulatory	Annual-Ongoing	Transportation Department	Department Budget

Table 5-25: 2017 Mitigation Measures for Tucson

Mitigation Action/Project				Implementation Strategy				
Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Priority Ranking	Planning Mechanism(s) for Implementation	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
Continue to fund and promote the following rebate and incentive programs: residential and small commercial rainwater harvesting rebate program; residential high-efficiency clothes washer replacement rebate program; Single-family residential gray-water rebate program; Single-family residential high-efficiency toilet replacement; rainwater harvesting grant/loan program for low-to-moderate income customers; free toilet replacement program for low-to-moderate income homeowners; commercial or multi-family high-efficiency toilet replacement program; commercial and industrial high-efficiency urinal replacement program.	Drought	Existing	\$1.4M	Medium	Tucson Water Department Drought Preparedness and Response Plan	Annual-ongoing	Tucson Water	Conservation Utility Fee

Table 5-25: 2017 Mitigation Measures for Tucson

Mitigation Action/Project				Implementation Strategy				
Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Priority Ranking	Planning Mechanism(s) for Implementation	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
Continue to fund and promote the Tucson Water Zanjero (water manager) residential water audit program.	Drought	Existing	\$271K	Medium	Tucson Water Department Drought Preparedness and Response Plan	Annual-ongoing	Tucson Water	Department Budget
Continue to participate in, promote and sponsor the Pima County SmartScape program in partnership with the University of Arizona Cooperative Extension.	Drought	Existing	\$239K	Medium	Tucson Water Department Drought Preparedness and Response Plan	Annual-ongoing	Tucson Water	Conservation Utility Fee
Review and update the City of Tucson Water Department Drought Preparedness and Response Plan.	Drought	Both	Staff Time	Medium	N/A	Every 5 years - ongoing	Tucson Water	Department Budget

Table 5-25: 2017 Mitigation Measures for Tucson

Mitigation Action/Project				Implementation Strategy				
Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Priority Ranking	Planning Mechanism(s) for Implementation	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
Assess, inventory, and map vulnerability within Tucson to seismic hazards. Conduct outreach efforts to property owners in high-seismic risk zones, or who own building at especially high risk for seismic damage such as historic adobe homes, about retrofits that can be made to their structures to reduce seismic impact. Use vulnerability data gathered to perform analysis of current building codes and propose changes, as appropriate, to reduce seismic risk community wide.	Earthquake	Both	Staff time	High	N/A	January, 2019	Planning and Development Services	Department Budget

Table 5-25: 2017 Mitigation Measures for Tucson

Mitigation Action/Project				Implementation Strategy				
Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Priority Ranking	Planning Mechanism(s) for Implementation	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
Perform feasibility study of a downtown District Energy model that would create greater energy and water resiliency in downtown Tucson.	Drought, Extreme Heat, Extreme Cold	Both	\$75K	High	Tucson Emerging 2030 District plan	July 2017	Environmental and General Services	City operating funds with matching County contribution
Assess the vulnerability of critical facilities to flooding from runoff and encourage reducing runoff and means for mitigating critical facilities when runoff cannot be reduced.	Flooding	Both	Staff time	Medium	N/A	Annual-ongoing	Planning and Development Services	Department Budget
Implement a severe wind risk awareness program with information about shelter locations, education for homeowners about retrofits, and education for professionals about wind mitigation.	Severe Wind	New	Staff time	Medium	N/A	June, 2018	Office of Emergency Management and Homeland Security	Department Budget
Implement a winter weather risk awareness program to educate the public on the risks of severe cold during winter storms.	Extreme Cold	New	Staff time	Medium	N/A	November, 2017	Office of Emergency Management and Homeland Security	Department Budget

Table 5-25: 2017 Mitigation Measures for Tucson

Mitigation Action/Project				Implementation Strategy				
Description	Hazard(s) Mitigated	Community Assets Mitigated (Ex/New)	Estimated Cost	Priority Ranking	Planning Mechanism(s) for Implementation	Anticipated Completion Date	Primary Agency / Job Title Responsible for Implementation	Funding Source(s)
Assess and identify specific at-risk populations vulnerable to long-term power outages and organize outreach efforts include establishing and promoting heating and cooling centers in the community.	Extreme Heat, Extreme Cold	Both	Staff time	High	N/A	January, 2018	Office of Emergency Management and Homeland Security	Department Budget

SECTION 6: PLAN MAINTENANCE PROCEDURES

Elements of this plan maintenance section include:

Monitoring, Evaluating, and Updating

Monitoring of Mitigation Activities

Incorporation into Other Planning Mechanisms

The participating jurisdictions in this Plan that reviewed this section recognized that it is intended to be a “living” document with regularly scheduled monitoring, evaluation, and updating. The 2012 Plan outlined specific steps in the Plan Maintenance; however, the 2017 Planning Team found that few, if any, formal reviews occurred over the past five years. Reasons for the lack of formal review were discussed by the Planning Team, and included:

- Staff turnover;
- Lack of funding for consultant plan reviews annually;
- Misunderstanding of the relationship between mitigation plans to anything other than grants eligibility;
- Lack of promotion of the Plan to the county departments, jurisdictions and the general public; and
- Inability of first responder agencies to understand the significance of mitigation planning to response priorities.

In an effort to avoid these issues again, the Planning Team discussed ways to make sure that the Plan is active and treated as a living document which are listed in Section 6.1.

6.1 Monitoring, Evaluating and Updating

The Planning Team has established the following monitoring and evaluation procedures revised for this Plan:

- **Adoption** – All jurisdictions will have the Plan adopted by their respective councils or boards by the end of September 2017. The Pascua Yaqui Tribe intend to adopt the updated plan on September 27, 2017 Tribal Council meeting.
- **Schedule** – The Plan shall be reviewed on at least an annual basis or following a major disaster. The Pima County Office of Emergency Management (PCOEM) will take the lead to reconvene the Planning Team annually near the anniversary of the official FEMA approval date. Participating jurisdictions have committed to providing resources to this effort annually. The PCOEM Planner and Operations Manager will be responsible for reconvening annually and initiation the next review cycle.
- **Review Content** – One month prior to the Planning Team review meeting, a reminder questionnaire will be distributed to each jurisdictions’ point of contact by the PCOEM Planner and will be returned by each jurisdiction within a minimum of three weeks. The approximate date of this review will be calendar year 2nd quarter in 2018, 2019, 2020 and 2021. The questionnaire will be comprised of the following questions:
 - **Hazard Identification:** Have the risks and hazards changed? Is there new information to include regarding the risks/hazards?
 - **Goals and objectives:** Are the goals and objectives still able to address current and expected conditions?
 - **Mitigation Projects and Actions:** What is the status of the mitigation measures in the current Plan?

During the annual meeting, each jurisdiction will have the opportunity to provide a report to the group summarizing its review of the Plan. The report will include their responses to the above questions and any other items specific to their community. Documentation of the annual meeting may include notes on the results of the meeting as well as

more specific information on the reasoning for proposed changes to the Plan for the next update cycle. Copies of the annual review report will be kept with the Plan for review and consideration in future reviews and the five-year update.

The Plan requires updating and approval from FEMA every five years. The Plan updates will adhere to that set schedule using the following procedure:

- One year prior to the plan expiration date (approximately Q2, 2021), the OEM Planner will reconvene the Planning Team to review and assess the materials accumulated from annual reviews and other documents related to hazards, disasters and mitigation actions taken;
- The Planning Team will update and revise the appropriate or affected portions of the plan and produce a revised Plan;
- The revised plan will be submitted to ADEMA and FEMA for review, comment and approval; and
- The revised Plan will be presented before the respective councils and boards for an official concurrence/adoption of the changes.

The APs and their implementation details are identified in the Plan's mitigation strategy. For each annual review and 5-year plan update, PCOEM will coordinate with the jurisdictional point of contact to assess the implementation status of the identified AP and generate a summary of each project using the following criteria:

- Current Status of Action/Project - Assign a 'No Action', 'In-Progress' or 'Completed' status as appropriate;
- Project Disposition – Assign a 'Keep' or 'Drop' to identify future disposition of action/project; and
- Explanation - Provide a description of the current project status, may include date of implementation, challenges faced, percentage completed, funding sources used, etc.

For FEMA supported projects, progress reports will be submitted to FEMA on a quarterly basis, or as required throughout the project duration. The degree of quarterly reporting will be dependent upon the type of AP, its funding source, and the associated requirements. The quarterly report may include:

- Project Completion Status,
- Project Challenges or Issues (if any),
- Budgetary Considerations (Cost Overruns or Underruns), and
- Detailed Documentation of Expenditures.

Upon completion of projects, the project location will be visited and results viewed and documented. Closed projects will then be monitored for effectiveness of the intended mitigation action. FEMA supported project closeouts will include an audit of the AP financials as well as other guidelines and requirements set forth under the funding or grant rules, and any attendant administrative plans developed by the Pascua Yaqui Tribe.

6.3 Incorporation into Other Planning Mechanisms

Incorporation of the Plan into other planning mechanisms, either by content or by reference, enhances a community's ability to perform hazard mitigation by expanding the scope of the Plan's influence. The participating jurisdictions acknowledge that incorporation of the Plan into other planning mechanisms has improved over the prior plan. Additional ways in which the 2012 Plan has been incorporated or referenced into other planning mechanisms for each jurisdiction are summarized below.

Past Activities

Pima County

- The 2012 Plan is cited in the Annual Recertification and 5-yr Cycle Verification of the Community Rating System for the NFIP.
- The Plan is referenced in amendment of the Comprehensive Plan, Rezoning, and Basin or River Management Planning efforts.

- The plan is used as reference material for the update of the Pima County Emergency Operations Plan on an annual basis. In 2015, the Plan was used to develop an El Niño Flood Annex to the EOP which was then converted to a Flood Annex for the EOP which also contains NFIP Community Rating System requirements.
- The drought hazard identification and risk information was used in the development of the County's Drought Response Plan and Water Wasting Ordinance.
- The wildfire hazard identification and risk information was used in the development of the Community Wildfire Protection Plan, 2013.

Marana

- Used by the Town of Marana during the update of the Emergency Operation Plan beginning in March 2010 and again in 2016.
- Used as a reference for the identification of natural and human-caused hazards in the Town's General Plan for 2010.
- Used as a reference for the identification of initiatives related to natural and human-caused hazards in the Town's Strategic Plan for 2015.
- Used by the Town of Marana as reference for development of Administrative Directives (ADs), Safety Directives (SDs), Standard Operating Procedures (SOPs) and Town policies beginning in 2010.
- Used as a reference for updating and eventual adoption of the Community Wildfire Protection Plan, 2013.

Oro Valley

- The plan is used as reference material for reviews and updates of the Town of Oro Valley Emergency Operations Plan and development of hazard specific plans.
- Mitigation actions and projects identified in the Plan correlate to Capital Improvement Projects or other planned projects.
- Supports the Town General Plan, adopted in November 2016.
- Used by the Stormwater Water Utility when looking at flood hazards, planning mitigation projects, and looking at mitigation funding.
- The wildfire hazard identification and risk information was used in the development of the Community Wildfire Protection Plan, 2013.

Pascua Yaqui Tribe

- Pascua Yaqui Tribe's Master Land Use Plan serves as a guide for decision makers to minimize incompatible land use. It provides a balance of land uses that preserves and enhances the neighborhood, support in-fill strategies, promote economic development, and protect environmentally and culturally significant resources. Mitigation strategies were addressed in the development of this plan.
- The master drainage study is a critical component to the Tribe's economic well-being, as well health, safety and general welfare of the community. It was adopted in 2004 to minimize the flooding and drainage problems. It requires no development zones set aside for conveyances of floodwaters and the construction of regional storm water retention facilities

Sahuarita

- The plan was used when developing the General Plan mainly in reference to the hazards and risks.

Tucson

- Used as reference material for the update of the 2014 Emergency Operations Plan.
- Used as reference material for the 2013 through 2015 Threat and Hazard Identification and Risk Assessment processes.
- Used as reference in the development of Continuity of Operations Plans for City departments.

- Used as a reference in the development of the new 2016 Tucson Floodplain Management Plan.

Future Activities

The Plan will continue to function as a standalone document subject to its own review and revision schedule. The Plan will serve as a reference for other mitigation and land planning needs of the participating jurisdictions. Whenever possible, the participating jurisdiction will endeavor to incorporate portions of the Plan into existing and future planning mechanisms as appropriate.

As is demonstrated above, the typical ways to use and incorporate the Plan include:

- Use of, or reference to, Plan elements in general and comprehensive planning update documents,
- Addition of defined mitigation APs to capital improvement programming,
- Inclusion of Plan elements into development planning and practices, and
- Resource for developing and updating emergency operations plans.

Specific incorporation of the Plan risk assessment elements into the natural resources and safety elements of each jurisdictions' general plans (county comprehensive plan) and development review processes, adding or revising building codes, adding or changing zoning and subdivision ordinances, and incorporating mitigation goals and strategies into general and comprehensive plans, may help to ensure hazard mitigated future development. In addition to continuing the past incorporation activities, below are the methods of incorporation the jurisdictions intend to implement over the next five-year period.

Pima County

- An annual review of the plan will be scheduled by the Office of Emergency Management including all 2017 plan participants. This will be held in April or May of each year and include a review of the hazards and risks and evaluation of mitigation Aps.
- The plan revision planning process will begin in the second calendar quarter of 2021 for the 2022 plan revision. The Office of Emergency Management Planner will coordinate planning activities.
- The plan will be referenced annually when updating the Pima County Emergency Operations Plan.
- PCOEM will continue outreach to County departments and committees to make them aware of the Plan and advise on how it can be incorporated into other planning activities.
- PCOEM will continue working with the County Grants Coordinator on funding opportunities for mitigation activities.

Marana

- The plan will be used as a resource during the update of the 2017 Town of Marana Emergency Operations Plan revision.
- The plan will be used for reference to identify hazards and mitigation strategies for the Town's General Plan in 2020.
- The plan will define mitigation APs for Town of Marana capital improvement projects and programming, for the next five-year cycle.

Oro Valley

- Participate in annual review of plan, as coordinated by the Pima County Office of Emergency Management.
- Use as a resource during next update of the Town Emergency Operations Plan.
- Inclusion of mitigation APs in capital improvement planning.
- Inclusion of Plan in implementation of the Town's newly adopted General Plan.

Pascua Yaqui Tribe

- A review of the plan will be conducted with the other jurisdictions annually.

- The plan will be referenced when working with other tribal departments on grants and plans development.
- The hazards and risks will be used in development of exercises for the tribe.
- As a part of National Flood Insurance Program requirements, the plan will be used as a reference.

Sahuarita

- The Town will participate in the annual plan reviews with other jurisdictions.
- The plan will be used as a resource when the Emergency Operations Plan is revised.

Tucson

- The 2017 plan will be used as reference in the ongoing revision of the City of Tucson Emergency Operations Plan and its ESF, Incident Specific and Support annexes with planned adoption in calendar year 2017.
- The plan will be used as reference in the development and revision of City of Tucson departmental continuity of operations plans.
- The plan will be referenced in review and revision to the “Plan Tucson” general and sustainability plan adopted and ratified in 2013.

Continued Public/Stakeholder Involvement

The jurisdictions were successful during the past five years in outreach to the public and jurisdictional stakeholders by keeping them informed and involved with activities related to the 2012 Plan. The jurisdictions are committed to continue that effort and intend to implement the following activities during the next five-year period, whenever possible:

Table 6-1: Continued Public and Stakeholder Involvement	
Jurisdiction	Activity or Opportunity
Pima County	<ul style="list-style-type: none"> • Continue working with the Regional Flood Control District on the Community Rating System (CRS) Program for Public Information, Notification and Exercise requirements. • Schedule annual mitigation review meetings with jurisdictional partners. • Enhance public outreach on mitigation issues through Everbridge mass notification tool. • Maintain the Mitigation Plan on the website. • Assist jurisdictions and county departments with mitigation grant funding opportunities.
City of Tucson	<ul style="list-style-type: none"> • Continue to pursue past activities listed above, in table 3-3, as appropriate. • Maintain a mitigation-focused page, with the updated mitigation plan, on the City of Tucson website. • Expand the use of social media to provide timely and accurate information on hazards and mitigation actions that can be taken against them. • Launch a localized Ready campaign for the City. • Build relationships with neighborhood organizations, HOA's, and other local leadership groups to help distribute hazard mitigation information to their communities.
Town of Oro Valley	<ul style="list-style-type: none"> • Continue to pursue past activities identified in Table 3-3. • Expand use of social media, PSAs, and websites to provide applicable and timely information on hazards. • Implement public involvement components identified in the 2016 General Plan.
Town of Marana	<ul style="list-style-type: none"> • Continue to pursue the past activities listed above, as appropriate. • Have a municipal representative attend state and locally funded symposiums such as The Continuing Challenge: HazMat Symposium, and the Southwest Gas Pipeline Safety Symposium for increased awareness of hazardous materials incident preparedness measures. • Provide floodplain related hazard and mitigation information to targeted properties in high-risk areas. • Provide flood hazard outreach annually to residents of the Town of Marana located within the flood plain. • Create updated brochures for building within the flood plain. • Conduct public outreach through open-house meetings for new "L" Series FEMA Flood Insurance Rate Maps (DFIRMs).
Pascua Yaqui	<ul style="list-style-type: none"> • Continue emphasizing mitigation activities in correlation to the Pascua Yaqui Tribe Improvement Projects program. • Continue PSAs on the Plan on the Intranet/Intranet and on Yaqui Radio Station. • Continue to use the plan for reference for profiling of cultural sites for economic development. • The Pascua Yaqui Department of Public Safety will continue to support the plan by referencing the plan with other tribal departments for grants and infrastructure improvement opportunities. • Participate in Tribal Recognition Days and other public outreach opportunities to promote mitigation opportunities and hazard reduction throughout the community.
Town of Sahuarita	<ul style="list-style-type: none"> • Solicit comments for Multi-Jurisdictional Hazard Mitigation Plan/announce Plan availability through social media outlets, town website and town newsletter. • The Emergency Operations Plan will be revised within the next year and reposted on town website. • Maintain link to Multi-Jurisdictional Hazard Mitigation Plan on town website. • Maintain "Be Prepared" information developed by FEMA on town website. • Launch social media campaign to promote emergency preparedness.

APPENDIX A: ACRONYMS

ADEMA	Arizona Division of Emergency Management and Military Affairs
ADFFM	Arizona Department of Forestry and Fire Management
ADEQ	Arizona Department of Environmental Quality
ADTF	Arizona Drought Task Force
ADWR	Arizona Department of Water Resources
AGFD	Arizona Game and Fish Department
AP	Actions/Projects
ARS	Arizona Revised Statutes
ASCE	American Society of Civil Engineers
ASERC	Arizona State Emergency Response Commission
ASLD	Arizona State Land Department
ASU	Arizona State University
AZGS	Arizona Geological Survey
BLM	Bureau of Land Management
CAP	Central Arizona Project
CAP	Community Assistance Program
CFR	Code of Federal Regulations
CNF	Coronado National Forest
CPRI	Calculated Priority Risk Index
CRS	Community Rating System
CWPP	Community Wildfire Protection Plan
DEMA	Arizona Department of Emergency and Military Affairs
DFIRM	Digital Flood Insurance Rate
DMA 2000/2K	Disaster Mitigation Act of 2000
DOT	Department of Transportation
EHS	Extremely Hazardous Substance
EMAP	Emergency Management Accreditation Program
EOP	Emergency Operations Plan
EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right to Know Act
ESF	Emergency Support Function
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
FMA	Flood Mitigation Assistance Grant Program
GIS	Geographic Information System
GRFD	Golder Ranch Fire District
HAZMAT	Hazardous Material
HAZUS-MH	Hazards United States Multi-Hazard
HI	Heat Index
HMGP	Hazard Mitigation Grant Program
HUD	Housing and Urban Development
IFCI	International Fire Code Institute
LEPC	Local Emergency Planning Committee
LDIG	Local Drought Impact Group
LPT	Local Planning Team
MMI	Modified Mercalli Intensity
MJHMP	Multi-Jurisdictional Hazard Mitigation Plan
MUTCD	Manual on Uniform Traffic Control Devices
NASB	Northern Arizona Seismic Belt
NCDC	National Climate Data Center

NDMC	National Drought Mitigation Center
NESDIS	National Environmental Satellite, Data and Information Service
NFIP	National Flood Insurance Program
NFPA	National Fire Protection Association
NHC	National Hurricane Center
NIBS	National Institute of Building Services
NID	National Inventory of Dams
NIDIS	National Integrated Drought Information Systems
NIST	National Institute of Standards and Technology
NPS	National Park Service
NSF	National Science Foundation
NOAA	National Oceanic and Atmospheric Administration
NRC	National Response Center
NWCG	National Wildfire Coordination Group
NWS	National Weather Service
PAG	Pima Association of Governments
PCOEM	Pima County Office of Emergency Management
PCRFCD	Pima County Regional Flood Control District
PCCWPP	Pima County Community Wildfire Protection Plan
PGA	Peak Ground Acceleration
PYT	Pascua Yaqui Tribe
PDM-C	Pre-Disaster Mitigation Competitive
PSDI	Palmer Drought Severity Index
RL	Repetitive Loss
SARA	Superfund Amendments and Reauthorization Act
SOP	Standard Operating Procedures
SPI	Standardized Precipitation Index
SRLP	Severe Repetitive Loss Properties
SRL	Severe Repetitive Loss
SRP	Salt River Project
TNRT	Tribal Nations Response Team
UBC	Uniform Building Code
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USDM	United States Drought Monitor
USDOT	United State Department of Transportation
USFS	United States Forest Service
USGS	United States Geological Survey
USSDO	United States Seasonal Drought Outlook
VA	Vulnerability Analysis
WUI	Wildland Urban Interface

APPENDIX B: RESOLUTIONS OF ADOPTION

PIMA COUNTY

TOWN OF MARANA

TOWN OF ORO VALLEY

PASCUA YAQUI TRIBE

TOWN OF SAHUARITA

CITY OF TUCSON

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APPENDIX C: PLANNING PROCESS DOCUMENTATION



**Pima County
Hazard Mitigation Plan Update Meeting #1
May 12, 2016 – 1pm to 5pm
3434 E. 22nd Street, Tucson, AZ**

AGENDA

1:00pm Welcome – Jeff Guthrie, Pima County OEM Director

Overview – DEMA and PCOEM

- What is Mitigation?
- Mitigation Plan Purpose
- Plan Benefits
- DMA 2000 (DMA2K) Requirements

Plan Review & Update – DEMA and PCOEM

- Community Descriptions
- Public Involvement
- Referencing Resources
- Hazards for Plan
 - Hazards Prioritization (CPRI)
 - Hazards for Plan
 - Hazards per Jurisdiction
 - Hazard Profile Update Responsibility
 - Loss Estimation Tables
- Mitigation Strategy

Next Meeting

5:00pm Adjourn

PIMA COUNTY
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

2017

Pima County Multi-Jurisdictional Hazard Mitigation Plan

Initial Planning Meeting

May 12, 2016
1pm to 5pm

Badge#	Name	Jurisdiction/Agency/Organization	Signature
	Abel, Patrick	Golder Ranch Fire District	
X032	Ackerman, Char	Oro Valley	<i>Char Ackerman</i>
	Allred, Kaleb	Town of Sahuarita	
	Anthis, Chris	Elephant Head Fire District	
2	Austin, Sue	State of Arizona	<i>Sue Austin</i>
	Baldwin, Kerry	Pima County	
	Bear, Courtney	Pima County	<i>Courtney Bear</i>
2	Bender, Cheryl	American Red Cross	<i>Cheryl Bender</i>
X34	Bradshaw, Gary	City of Tucson	<i>Gary Bradshaw</i>
	Brant, Michael	Northwest Fire District	
	Calkins, Bill	Salpointe High School	
X14	Carbajal, Manny	Marana	<i>Manny Carbajal</i>
X039	Casertano, Paul	Pima Association of Governments	<i>Paul Casertano</i>
	Castro, Marnie	Arivaca Fire District	
X037	Chalmers, Seth	Pima County	<i>Seth Chalmers</i>
	Chappell, Doug	Drexel Heights Fire District	
	Clements, Billy	Pima County	
	Coleman, Jeffrey	Tucson Unified School District	
	Contorno, Dan	Marana Unified School District	
	Corrallo, Priscilla	Pima County	
	Coyle, Jennifer	Pima County	
	Crouse, Dane	Drexel Heights Fire District	
	Davis, Simon	Corona de Tucson Fire District	
	Delfs, Brian	Avra Valley Fire District	
	D'Entremont, Andy	Pima County	<i>Andy D'Entremont</i>
X73	Drozd, Ken	NOAA	
	Eib, Lauren	Pima County	
X77	Espinoza, Sandra	State of Arizona	<i>Sandra Espinoza</i>

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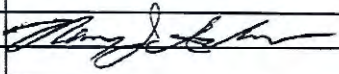
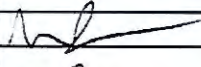
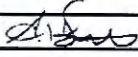
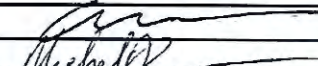
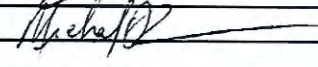
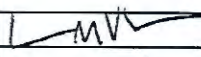




PIMA COUNTY
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

2017

Pima County Multi-Jurisdictional Hazard Mitigation Plan

Initial Planning Meeting

May 12, 2016
1pm to 5pm

Badge#	Name	Jurisdiction/Agency/Organization	Signature
	Scott, Tim	Pima County	
	Seastrom, Brian	University of Arizona	
X 3	Selover, Nancy	Arizona State University	
	Shepard, S	Metro Water	
X 25	Shepp, Eric	Pima County	
	Shields, Suzanne	Pima County	
X 9	Siemsen, Nick	City of Tucson	
X 36	Smith, Allen	City of Tucson	
	Soto, Joe	Pima County	
	Stengel, Gary	Pima County	
	Traubert, John	Town of Oro Valley	
X 5	Thum, Gabe	Pima Association of Governments	
X 22	Todnem, Mike	Oro Valley	
	Tolo, John	Tucson Electric Power	
	Tracey, Vincent	Pima County	
	Tucker, Tom	Tucson Airport Authority	
X 29	Valenzuela, Louie	Pima County	
	Wagaman, Stan	Arivaca Fire District	
X 7	Wagner, Doug	Tucson Airport Authority	
X 31	West, Gary	Northwest Fire District	
	Williams, John	Three Points	
X 10	Wittenberg, Dan	Kinder Morgan	
	Wunder, Chuck	Green Valley Fire District	
	Youberg, Ann	State of Arizona	
	Zimmel, Karl	Tucson Electric Power	
	Zimmerman, Bill	Pima County	
X 33	Roaniver, Bernice	Pasqua Pueblo Fire Dept	

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Meeting Notes

Pima County Hazard Mitigation Plan Update Meeting #1

May 12, 2016 – 1pm to 5pm

3434 E. 22nd Street, Tucson, AZ

Welcome – Jeff Guthrie, Pima County OEM Director

Introductions – participants introduced themselves.

In attendance:

Char Ackerman – Town of Oro Valley Emergency Management
Sue Austin – Arizona Department of Emergency & Military Affairs
Courtney Bear – Pima County Office of Emergency Management
Cheryl Bender – American Red Cross
Gary Bradshaw – City of Tucson Fire Dept.
Manny Carbajal – Town of Marana Emergency Management
Paul Casertano – Pima Association of Governments
Seth Chalmers – Pima County DOT
Andy D'Entremont – Pima County Office of Emergency Management
Ken Drozd – NOAA
Sandra Espinoza – Arizona Department of Emergency & Military Affairs
Jim Faas – Pima County Finance & Risk Management
Brian Groseclose – Town of Sahuarita
Mike Hammarstrom – City of Tucson Police Dept
Thomas Helfrich – Pima County Regional Flood Control
Jeff Horton – Tucson Airport Authority
Steve Johnson – Town of Marana Police Dept
Sarah Karasz – Arizona DOT
Jay Karlik – Rural/Metro Fire Department
Joey Kosiorowski – Green Valley Fire District
Paul Langdale – Arizona DOT
Brian Lauber – Arizona Division of Forestry
Judy Lynn – Pima County Office of Emergency Management
Rita Mercer – Pima County Regional Wastewater Reclamation
Richard Miranda – Pima County Regional Wastewater Reclamation
Griselda Moya-Flores – Pima County Office of Emergency Management
Richard Nassi – Pima Association of Governments
Robert Padilla – Pima County Natural Resources/Parks & Rec
Bernice Rodriguez – Pascua Pueblo Emergency Management
Greg Saxe – Pima County Regional Flood Control
Nancy Selover – ASU State Climatologist
Eric Shepp – Pima County Regional Flood Control
Nick Siemsen – City of Tucson Emergency Management
Allen Smith – City of Tucson Police Dept.
Gabe Thum – Pima Association of Governments
Mike Todnem – Oro Valley Stormwater Utility

Louie Valenzuela – Pima County Dept of Health
Doug Wagner – Tucson Airport Authority
Gary West – Northwest Fire District
Dan Wittenberg – Kinder Morgan Energy

Overview – DEMA and PCOEM

Sue Austin with DEMA gave an overview covering the agenda items.

The current plan expires in June of 2017. All mitigation plans are updated every 5 years per FEMA. Our goal is to complete our plan update within six months. FEMA may take a few months to review the plan and respond to jurisdictions with pending approval or revisions needed. According to S Austin reviews are currently taking approx. 3 months.

What is Mitigation? Efforts to reduce or eliminate damage effects of disasters. Mitigation is to reduce and eliminate. Eliminate is difficult but reduction is not.

What is the Mitigation Plan purpose? The plan allows you eligibility to apply for FEMA mitigation grant funding for natural hazard mitigation projects. Recovery dollars are tied to the state plan and not affected by the Mitigation Plan. Response dollars are not tied to the Mitigation Plan.

Do the hazards you have identified in the plan limit the grants you can apply for? Yes and no. Any projects you apply for from FEMA must be 'consistent' with your current mitigation plan. Example: if you apply for funding for a flood mitigation project, flooding must be addressed in your plan.

What are the benefits of this effort? This is multi-jurisdictional – multiple participants in one plan with one approval date and a coordinated effort. Marana, Oro Valley, Tucson, Pasqua Yaqui, Sahuarita and Pima County were in the 2012 plan. Tohono O'Odham has a stand-alone plan and South Tucson didn't complete the planning process in 2012. We may add Tucson Airport Authority in the plan. TASK: Sue is checking on requirements and will communicate with TAA the outcome.

Sue will be the guide and facilitator; Pima County Office of Emergency Management (PCOEM) is the lead planning agency since the boundaries of this plan are the jurisdictional boundaries of Pima County.

We then went through some sections of the plan after handing out several hard copies of the plan:

- Reviewed the table of contents with a brief discussion about appendices and list of Maps and Figures. Jurisdictions will have to decide about keeping, deleting or adding maps and figures.
- Section One; Jurisdictional Adoption and FEMA Approval
 - What are DMA 2000 (DMA2K) Requirements? Mitigation planning is the attempt by the federal government to break the cycle of costly damage repair and to become safer and better protected communities. It puts some of the responsibility back at the local level for disaster events. All jurisdictions must meet the basics of the plans for the multi-jurisdictional plan review to be successful with FEMA. We will also need to address 'climate change' into the new revision to pass state review however it is not required yet from FEMA.

- Section Two: Introduction. Review and make the changes. General discussion about plan update process. Any changes we send to the team and they can accept or reject changes. TASK – Courtney & Andy – devise a method for updating any reference and resource documents that the jurisdictions used for updating their information.
- Section Three: Planning Process
 - What is the process to revise? Process will take about three meetings and require active participation from people responsible for providing information for each jurisdiction. Stakeholders will provide input to the plan from the different jurisdiction. It is critical that if the main jurisdictional planner can't make it someone attend for them to bring the information back. List of planning team members is required, but also need to list the "Local Planning Resources." TASK - create a way to track the Local Planning Resources for the documentation – Courtney & Andy.
 - FEMA requires that we document the planning process, so we will be taking notes, agendas, and sign-in sheets for documentation of the process which becomes part of the plan. FEMA wants to see the 'whole community' involved, so other interested parties are encouraged to attend and participate in the process. Specialized personnel will be needed at different stages of the process from inside and outside Pima County.
 - Sue removed the first sections that were not necessary.
 - Public and Stakeholder Involvement - Public needs to have the opportunity to review and comment on the planning and planning process. At least two times, once during the process (now) and when plan is in draft form and prior to being submitted to FEMA we need to reach out to the public to allow review of and comment on plan. This will be done by posting the plan on the county website with a notice about process and the local jurisdictions will post notification and link to county plan site. There will also be a link by which they can comment or ask questions.
 - We discussed having the county be the point of contact for the jurisdictions. TASK - Judy Lynn with PCOEM will take the lead and will post the current draft and information on how the public can comment on the Pima County website during comment period. TASK: All jurisdictions will share public notices through social media and other venues (e.g. newspaper articles, public notices, etc.). TASK: Each participating jurisdiction will archive the copies of the articles they publish and send them to Judy for incorporation into the final document. TASK: Judy will manage electronic feedback from the comment periods and ensure it is routed to the appropriate jurisdiction.
 - Each jurisdiction has to have a few bullet points of the activities along with their documentation in addition to listing future activities. Include how you will keep the public and stakeholders involved in the next 5 years including education and public outreach about each of the hazards.
 - Currently there is only a paragraph for each jurisdiction, that will not do for this next time. As we are rolling with it, once more. Have open comments time frame. Need to take screen shot to document activities that it was posted on website. Collect all documentation for inclusion in plan appendices.
- Section Four: Community Descriptions
 - Each participating jurisdiction needs to revise their description and provide the maps and info that they want here. Any additional information should be incorporated and date sensitive information should be updated or deleted. Redundancies can be whittled down.

- We will provide jurisdictional information in an editable format in the next week or so. TASK – send each jurisdiction their information – Sue, Courtney and Andy. Each jurisdiction will get their info in a word document to revise. TASK – jurisdictions review and update this information and return to Courtney and Andy. Do not spend too much time on this section as it is not a significant part of the requirements, Sue will help us prioritize based on requirements. TASK – Find a lead to gather population and economy data or do it ourselves by jurisdiction – planning team, PAG may be able to assist. NOTE: information and data updated or added – include the source of the material.
- Section Five: Risk Assessment
 - We had a long discussion of what hazards are included and why. We went through each of the sections for each of the identified hazards and what they should contain. Discussion doesn't have to be quantitative; qualitative narrative works as well.
 - Overview
 - History
 - Probability and Magnitude
 - Loss Estimations – don't need data, but a narrative would work. Coconino has examples. May need data tables for flood, but narrative for others. TASK – need to look at Flood HAZUS to see if it would meet the flood insurance program needs – Eric Shepp. They may be able to go narrative and still satisfy their requirements for Community Rating System for National Flood Insurance Program. Could go table for unincorporated and narrative for jurisdictions. Need to address by next meeting.
 - Removal of any hazards requires justification in the plan. Quick narrative works.
 - Jurisdictional Agencies – each jurisdiction chose their hazards to be mitigated and as a part of the revision, they will have the opportunity to address whether they stay the same or change.
- Section Six: Mitigation Strategy –
 - FEMA doesn't do anything man-caused – levees, hazmat, disease. Natural hazards are the focus. Human-caused aren't held to the same FEMA requirements but are completely allowed in the plan. The team chooses the hazards based on risk and vulnerability.
 - Just because a risk is identified in the plan, that does not mean that each jurisdiction needs to mitigate all items listed. Once we get to risk assessment we can decide what goes in the plan; we can add or omit risks but you need to justify the change in the plan. when applying for FEMA mitigation grants, each project has to solve a problem on its own. No research, no study, no planning counts as mitigation without an actionable piece/phase that fits in long-term mitigation solution. TASK – Courtney & Andy - when sending the minutes, send the hazards by jurisdiction, so they can decide if they are going to keep them based on natural hazards, funding for mitigation grants only for natural, more things in plan, more work to be done – Hazard Table below. TASK – Courtney & Andy - send out the mitigation files in table format that Sue will provide to the jurisdictions. They need to report status and disposition even though it may not be continued into the next plan.
- Section Seven: Plan Maintenance Procedures – Jurisdictions need to list how they are going to maintain future activities during the next 5-year cycle. Future activities can include public involvement like wildfire preparedness, monsoon awareness, etc.

Next meeting will be scheduled for early June. Some participants were asked to be removed as they didn't see the relevance to their jobs. TASK – Courtney and Andy – make sure missing individuals are asked to participate and remove unnecessary participants and schedule June meeting.

Task Table:

Task:	Assigned to:	Due by:	Status/Notes:
Verify Tucson Airport Authority and their place in the plan potentially as a "jurisdiction."	Sue Austin	Next meeting	
Devise a method for updating any reference and resource documents that the jurisdictions used for updating their information.	Courtney Bear Andy D'Entremont	Next meeting	
Create a way to track the "Local Planning Resources" for the documentation.	CBear AD'Entremont	Next meeting	Listing of people that assisted as SMEs
Post the current draft and information on how the public can comment on the Pima County website during comment periods.	Judy Lynn	Ongoing	Plan posted by CBear on 5/24, JLynn has draft public comment complete 5/20.
Share public notices through social media and other venues (e.g. newspaper articles, public notices, etc.)	All Jurisdictions PCOEM	As defined in June meeting	
Manage electronic feedback from the comment periods and ensure it is routed to the appropriate jurisdiction.	JLynn	Ongoing	
Archive the copies of the articles they publish and send them to Judy for incorporation into the final document.	Jurisdictions	Ongoing	
Send each jurisdiction their information – Community Descriptions and Mitigation Strategy	CBear SAustin	Complete	Sent with 5/24 email to participants
Edit Community Descriptions and return to CBear and AD'Entremont	Each Jurisdiction	By June Meeting	Don't spend a lot of time here, clean up and revise per SAustin
Edit Pima County Unincorporated Community Description	AD'Entremont	By June Meeting	
Need to look at Flood HAZUS to see if it would meet the NFIP program needs.	Eric Shepp AD'Entremont	By June Meeting	

Find a lead to gather population and economy data or do it ourselves by jurisdiction.	CBear to speak with PAG	By June Meeting	Courtney Bear to speak with PAG
Send the hazards by jurisdiction table from 2012 plan.	CBear	Done	Below and in linked documents
Jurisdictions need to decide what hazards they are going to keep.	All Jurisdictions	By June Meeting	Base decision on natural hazards, funding for mitigation grants only for natural, more things in plan, more work to be done
Send out the mitigation table format for jurisdictions to revise.	CBear	Done	
Report status and disposition of mitigation strategies even though the strategy may not be continued into the next plan.	All jurisdictions	By June Meeting	
Make sure missing individuals are asked to participate and remove unnecessary participants and schedule June meeting	CBear AD'Entremont	By June 1 st	

Hazards by Jurisdiction 2012

Table 4-27: Hazards to be mitigated by each jurisdiction

Jurisdiction	Disease	Drought	Earthquake	Extreme Temperature	Flood	HAZMAT	Levee Failure	Severe Wind	Subsidence	Wildfire	Winter Storm
Unincorporated Pima County	x				x		x				
Marana					x	x				x	
Oro Valley	x	x		x	x	x				x	x
Pascua Yaqui Tribe	x	x	x		x			x		x	
Sahuarita	x			x	x	x				x	
South Tucson	No Data Provided by Jurisdiction										
Tucson		x	x		x			x	x		

Courtney Bear

Subject: MJHMP Maps and Data Subteam Meeting
Location: PCEOC - 3434 E. 22nd Ave Room 108

Start: Thu 7/14/2016 1:00 PM
End: Thu 7/14/2016 3:00 PM

Recurrence: (none)

Meeting Status: Meeting organizer

Organizer: Courtney Bear
Required Attendees: 'Nicolas Siemsen'; 'tjohnston@sahuaritaaz.gov'; 'Bernice E. Rodriguez'; 'Manny Carbajal'; 'Steve Johnson'; 'Gabe Thum'; 'Richard Nassi'; 'Greg Saxe'; 'Erik Glenn'; 'Jjamarta@pagregion.com'; 'Ian.Geitner@pascuayaqui-nsn.gov'; 'aabdelrasoul@orovalleyaz.gov'; 'Tony.Fortes@pascuayaqui-nsn.gov'; 'Andrew D'Entremont'; 'Judy Lynn'
Optional Attendees: Ronald Bishop; Bret Canale; Boyer, Chuck

Categories: PCOEM

Agenda for tomorrow is more of an open discussion on what data and maps we need, where do we get it from, how does it look, etc. I will have an electronic copy of the plan up on the projector, so we can look around.

See you at 1pm.

Thanks,
Courtney

Hello Everyone,

This looked like the best option for the meeting.

I'll add an agenda here shortly, but for starters, if you haven't already, please review the 2012 plan and the working 2016 revision at the bottom of the [Pima County Mitigation Page](#) under the Mitigation Planning header specifically at the data and mapping items contained within. We would like to come up with a cohesive plan for updating these items as easily as possible.

Thanks,
Courtney

Courtney Bear
Operations Manager
Pima County Office of Emergency Management
3434 E. 22nd Street, Suite A
Tucson, AZ 85713
520-528-5219 (cell) | 520-724-9315 (office)
520-724-9300 (main) | 520-724-9310 (fax)



PIMA COUNTY
EMERGENCY MANAGEMENT

PIMA COUNTY OFFICE OF EMERGENCY
EOC Sign In Sheet

DATE: 7-14-16

EVENT: MTHMG Plan Data & Maps

EOC Badge #	Last Name	First Name	Organization/Jurisdiction
/	Bear	Courtney	PCOEM
	DEANDREMAT	ANDY	PCOEM
001	SIEMSEN	NICOLAS	TOEMHS
	Johnson	STAIR	MARANA PD
005	Jamarter	Julie	PAG
006	Thum	Gabe	PAG
007	CANALE	BRET	MARANA
008	JOANSTON	TOM	SAHUARITA
009	BOYER	CHUCK	Town of Oro Valley
10	Saxe	Greg	PCRFCD
011	Ackerman	Char	OUPD
012	CARBATAL	Manny	Town of Marana
013	Abdo Abdelrasoul		Town of Oro Valley
014	Glenn	Erik	Pima County



PIMA COUNTY OFFICE OF EMERGENCY
EOC Sign In Sheet

DATE: 7-14-16

EVENT: MIHMP Data Maps

EOC Badge #	Last Name	First Name	Organization/Jurisdiction
	Forbes	Antonio	Pasqua Yuma Tribe



**Pima County
Hazard Mitigation Plan Update Meeting #2
July 27th, 2016 – 9am to noon
3434 E. 22nd Street, Tucson, AZ**

AGENDA

- **Welcome & Introductions – Courtney Bear, Pima County OEM Ops Mgr**
- **Introductions**
- **Overview of Public Outreach Progress – Judy**
- **Review of GIS and Data Meeting – Courtney and Andy - notes attached**
- **Update from Jurisdictions on your Community Descriptions – Courtney and Andy - then jurisdictional coordinators**
- **Hazards – all – each jurisdiction needs to make sure they are ready to designate their hazards.**
- **Next Meeting**
- **Adjourn**

PIMA COUNTY
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

2017

Pima County Multi-Jurisdictional Hazard Mitigation Plan

9:00 Am Meeting 7/27/2018
Second Planning Meeting

Mitigation

July 27, 2016
9am to Noon

Badge	Initial	Name	Jurisdiction/Agency/Organization	Department/Division/Branch	Title	E-mail Address
116	CAO	Ackerman, Char	Oro Valley	OVPD		caackerman@orovalleyaz.gov
		Allred, Kaleb	Town of Sahuarita	Police Department	Commander	kallred@sahuaritaaz.gov
112	SA	Austin, Sue	State of Arizona	Department of Military and Emergency Affairs	Mitigation Planner	Susan.Austin@azdema.gov
		Baldwin, Kerry	Pima County	Natural Resources/Parks & Rec		kerry.baldwin@pima.gov
		Bear, Courtney	Pima County	Office of Emergency Management	Operations Manager	courtney.bear@pima.gov
101	MC	Carbajal, Manny	Marana	Office of Emergency Management	Emergency Management Coordinator	mcarbajal@maranaaz.gov <i>his change</i>
		Casertano, Paul	Pima Association of Governments			pcasertano@paganet.org
117	AD	Chalmers, Seth	Pima County	Department of Transportation		seth.chalmers@pima.gov
		Chavez, Kathy	Pima County	Office of Sustainability		kathy.chavez@pima.gov
		Coyle, Jennifer	Pima County	Regional Wastewater Reclamation		jennifer.coyle@pima.gov
		D'Entremont, Andy	Pima County	Office of Emergency Management	Program Coordinator	Andrew.D'Entremont@pima.gov
		Droz, Ken	NOAA	National Weather Service		kenneth.droz@noaa.gov
102	SE	Espinoza, Sandra	State of Arizona	Department of Military and Emergency Affairs	South Region Field Coordinator	sandra.espinoza@azdema.gov
		Faas, Jim	Pima County	Finance and Risk Management	Environmental Services Officer	jim.faas@pima.gov
119	EG	Glenn, Erik	Pima County	Information Technology	Senior GIS Analyst	Erik.Glenn@pima.gov
150	MC	Grosclose, Brian	Town of Sahuarita	Police Department		bgrosclose@cl.sahuaritaaz.gov
		Hammarstrom, Mike	City of Tucson	Police Department	Lieutenant	mike.hammarstrom@tucsonaz.gov
		Helfrich, Thomas	Pima County	Regional Flood Control	Division Manager	tom.helfrich@pima.gov
106	JA	Horton, Jeff	Tucson Airport Authority	Public Safety/Operations/Communication	Director of Airside Ops & Comm	jhorton@flytucson.com
		Johnson, Eric	Pima County	Sheriff's Office	Captain	eric.johnson@pima.gov
		Johnson, Steve	Marana	Police Department	Sergeant	sjohnson@maranaaz.gov <i>his change</i>
		Johnston, Tom	Sahuarita	Police Department	Officer	tjohnston@sahuaritaaz.gov
		Karasz, Sarah	State of Arizona	Department of Transportation	Environmental Planning - PAG	SKarasz@azdot.gov
108	AK	Kartik, Jay	Rural/Metro Fire Department	Fire Department	Battalion Chief	jay.kartik@rmetro.com
		Khawam, Yves	Pima County	Development Services	Chief Building Official	Yves.Khawam@pima.gov
114	AK	Ladd, Kieth	University of Arizona			ladd@email.arizona.edu
		Lakosky, Cory	South Tucson	Fire Department	Chief	Clakosky@southtucson.org

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PIMA COUNTY
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

2017

Pima County Multi-Jurisdictional Hazard Mitigation Plan

Mitigation

Second Planning Meeting

July 27, 2016
9am to Noon

Badge	Initial	Name	Jurisdiction/Agency/Organization	Department/Division/Branch	Title	E-mail Address
		Langdale, Paul	State of Arizona	Department of Transportation	Environmental Planning Policy Advisor	plangdale@azdot.gov
		Lauber, Brian	State of Arizona	Forestry Division	Special Projects	BrianLauber@azsf.gov
		Lynn, Judy	Pima County	Office of Emergency Management	Community Outreach Coordinator	judy.lynn@pima.gov
		Manos, Michele	Pima County	Health Department	Senior Consultant	michele.manos@pima.gov
111	<i>AM</i>	Matus, Andre	Pascua Yaqui	Fire Department	Chief	andre.matus2@pascuayaqui-nsn.gov
		Mercer, Rita	Pima County	Regional Wastewater Reclamation	Program Manager	rita.mercer@pima.gov
		Miranda, Richard	Pima County	Regional Wastewater Reclamation	Program Manager	richard.miranda@pima.gov
		Moya-Flores, Griselda	Pima County	Office of Emergency Management	Administrative Specialist	Griselda.Moya-Flores@pima.gov
		Nassi, Richard	Pima Association of Governments	Transportation		rnassi@gmail.com
		Nunes, John	Vall School District	Transportation & Emergency Management	Director	nunesj@vallschoolsdistrict.org
		Pacheco, Aaron	Pima County	Health Department		Aaron.Pacheco@pima.gov
		Padilla, Robert	Pima County	Natural Resources/Parks & Rec	Deputy Director	robert.padilla@pima.gov
115	<i>SP</i>	Porter, Scott	Pima County	Environmental Quality	Manager	Scott.Porter@pima.gov
116	<i>JR</i>	Robinson, Julie	Pima County	Office of Sustainability	<i>Manager</i>	julie.robinson@pima.gov
		Rodriguez, Bernice	Pascua Yaqui			bernice.e.rodriguez@pascuayaqui-nsn.gov
		Romero, Lisa	Pima County	Office of Emergency Management	Administrative Support	lisa.romero@pima.gov
101	<i>BS</i>	Saxe, Greg	Pima County	Regional Flood Control	Environmental Planning Manager	greg.saxe@pima.gov
104	<i>NS</i>	Selover, Nancy	Arizona State University	Arizona State Climate Office	State Climatologist	selover@asu.edu
		Shepp, Eric	Pima County	Regional Flood Control	Flood Plain Administrator	eric.shepp@pima.gov
		Siemens, Nick	City of Tucson	Fire Department	Emergency Management Coordinator	Nicolas.Siemsen@tucsonaz.gov
103	<i>AS</i>	Smith, Allen	City of Tucson	Police Department	Sergeant	allen.smith@tucsonaz.gov
		Stengel, Gary	Pima County	Sheriff's Office	Captain	gary.stengel@sheriff.pima.gov
		Thurn, Gabe	Pima Association of Governments	Transportation Safety	Program Coordinator	gthurn@pagregion.com
		Valenzuela, Louie	Pima County	Health Department	Preparedness Coordinator	Louie.Valenzuela@pima.gov
		Wagner, Doug	Tucson Airport Authority	Planning & Development	Project Manager	dwagner@tftucson.com
113	<i>AY</i>	Youberg, Ann	State of Arizona	AZ Geological Survey		ann.youberg@azgs.az.gov
110	<i>JP</i>	Greiner, Jan	Pascua	Land Use	Director	janigreiner@pascuayaqui-nsn.gov

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Meeting Notes

Pima County Hazard Mitigation Plan Meeting #3

July 27, 2016, 2016 – 9am to Noon

3434 E. 22nd Street, Tucson, AZ

Welcome – Courtney Bear, Pima County OEM Operations Manager

Introductions – participants introduced themselves.

In attendance:

Char Ackerman – Town of Oro Valley Emergency Management

Sue Austin – Arizona Department of Emergency & Military Affairs

Courtney Bear – Pima County Office of Emergency Management

Manny Carbajal – Town of Marana Emergency Management

Seth Chalmers – Pima County DOT

Andy D’Entremont – Pima County Office of Emergency Management

Sandra Espinoza – Arizona Department of Emergency & Military Affairs

Ian Geitner – Pasqua Yaqui

Erik Glenn – Pima County GIS

Brian Groseclose – Town of Sahuarita

Jeff Horton – Tucson Airport Authority

Jay Karlik – Rural/Metro Fire Department

Ladd Keith – UofA CAPLA

Judy Lynn – Pima County Office of Emergency Management

Andre Matus – Pascua Pueblo Emergency Management

Griselda Moya-Flores – Pima County Office of Emergency Management

Scott Porter – Pima County Environmental Quality

Julie Robinson – Pima County Office of Sustainability

Greg Saxe – Pima County Regional Flood Control

Nancy Selover – ASU State Climatologist

Allen Smith – City of Tucson Police Dept.

Ann Youberg – AZ State Geological Survey

Overview –

- Welcome & Introductions – Courtney Bear, Pima County OEM Ops Mgr
- Introductions – See attendees above
- Overview of Public & Stakeholder Involvement
 - Judy handed out draft of the public comment and we discussed having anonymous vs. identified comments including name and phone. Decided to leave the blanks, but not make them mandatory.

- **TASK:** Judy will establish the link and distribute as soon as possible – Done as of 8/5/16.
- Sue described the end goal as giving the public the opportunity to review and comment about the process, the current plan, and the draft plan when ready to go. The verbiage will change during each stage. Final comment period should be at least two weeks before plan goes to FEMA. Providing a jurisdictional contact or pointing to Pima OEM is up to the jurisdiction.
- Discussed if posting in the paper is a requirement – it is not.
- **TASK:** Judy will track the comments for all, so send Judy copies of your postings – screen shot, printout PDF or whatever works.
- **TASK:** Jurisdictions to comment back on any changes for the release by August 4th. - Done
- Courtney displayed the County's mitigation website with the public announcement. The current plan will remain posted until the new draft is ready for review.
- Discussed public and stakeholder involvement and tracking. **TASK:** Jurisdictions to send bullet points of their planned activities for the next five years and anything they have done to date (public interactions, presentations, etc.). **TASK:** Judy to incorporate into the file for addition to the document.
- **Review of GIS and Data Meeting**
 - Courtney reviewed the outcome of the separate Map and Data meeting. The overall amount of maps and data in the plan will be reduced.
 - Pima County GIS will be coordinating map standard and working with jurisdictional GIS contacts.
 - It was Oro Valley that will be pending land use date for late fall. We will incorporate at that time.
 - Briefly discussed the Arizona Natural Hazards Viewer. Ann Youberg can provide more information if needed. Link is: <http://data.azgs.az.gov/hazard-viewer/>.
 - **TASK:** Courtney to send updated Maps and Data Excel file to Erik for further work and check with PAG on population data. Erik will continue to work with jurisdictions as we choose our hazards. Done – 8/2/16
- **Update from Jurisdictions on your Community Descriptions**

- Jurisdictions were tasked with updating these. A couple have been completed and returned to Courtney and Andy. If no changes are received, descriptions will remain the same as of October 1st. Sue Austin reminded everyone that there are no requirements on how this section will look or the amount of information required in them, but the reader should have an introductory glimpse at your community. Don't hurt yourself trying to do this.
- Andy discussed handling of source data and input of Community Descriptions. Send his way; he will integrate.
- Risks/Hazards
 - Climate change discussion will begin with this update, so it will need to be included in the plan somewhere. Address "changing conditions" and how that might impact each of the hazards is one way of handling it and probably how we will address as a team. **TASK:** Ladd Keith of UofA will provide us with some short summaries of climate change impacts that we can incorporate.
 - Seth with PCDOT brought up that he ID'd fourteen different hazards, so we discussed the benefit of adding hazards and splitting or combining others. Lightning was brought up as one to stand alone, but then determined it is usually a component of another hazard (thunderstorms, severe wind). It was thought of combining levee failure and flood but determined that although levee failure leads to flooding, so do many other events. It was decided that since there were already separate hazards for each, they would remain that way as there is no real benefit to combining.
 - Dust is the #3 hazard in Arizona, and there are teams working on it on a statewide basis including AZDOT and NWS. Discussed adding it, but decided Wind would cover it, so any mitigation actions for dust can go there.
 - Discussed the possibility of adding landslide to Pima County Risks. Ann Youberg from AZGS and others claim the risk does exist and should be considered. If added, A. Youberg will assist in compiling the hazard profile. **TASK:** S. Austin will send Courtney the landslide hazard profile from the state plan. Jurisdictions will address the hazard when completing their CPRI. – Done 8/11/16 Landslide added to the hazards and Word version added to the document share.

- Sue discussed that one of the reasons some plans have failed is failure to keep track of planning resources – who helped you, who provided you contacts, further information, etc.
TASK: Jurisdictions to keep a list of all contacts on the sheet to return at the end of the process. Also, keep a copy of your separate meetings and attendees with agendas, etc.
- All documents posted at:
<http://webcms.pima.gov/cms/One.aspx?pageId=268195&objectId.16949=268199&contextId.16949=268198>
- Next Meeting – August 24th at 0900 at the PECOC – topic will be updates and then on into Mitigation Strategies discussion.
 - In the mitigation folder, you will find your jurisdictional table as well as the working draft of the Chapter 5 Mitigation Strategies to review for the next meeting.
- Adjourn

Task Table:

Task:	Assigned to:	Due by:	Status/Notes:
Need to look at Flood HAZUS to see if it would meet the NFIP program needs.	Greg Saxe AD'Entremont CBear EGlenn	08/19	Decided to keep the data for flooding in the table to meet the NFIP needs. Plan to put ARC-GIS and HAZUS on a PCEOC computer by 8/19 where multiple people can access it.
Report status and disposition of mitigation strategies even though the strategy may not be continued into the next plan.	All jurisdictions	08/24	CBear to send mitigation strategies out for edit to jurisdictions again.
Edit Community Descriptions and return to CBear and AD'Entremont	Each Jurisdiction	09/01	Don't spend a lot of time here, clean up and revise per SAustin. As of July 27, only two jurisdictions complete. Send in by 09/01 for incorporation. Oct. is your drop date for no more changes.
Jurisdictions need to decide what hazards they are going to keep after finishing their CPRI.	All Jurisdictions	10/01	CPRI complete by 8/24. Hazards with mitigation actions by 10/01. Base decision on natural hazards, funding for mitigation grants only for natural, more

			things in plan, more work to be done
Share public notices through social media and other venues (e.g. newspaper articles, public notices, etc.)	All Jurisdictions PCOEM	Ongoing	Ongoing beginning August 1 st .
Manage electronic feedback from the comment periods and ensure it is routed to the appropriate jurisdiction.	JLynn	Ongoing	Judy will forward as appropriate. All follow up should be returned to Judy for documentation. Any other relevant interactions should be forwarded to Judy to document.
Archive the copies of the articles they publish and send them to Judy for incorporation into the final document.	Jurisdictions	Ongoing	Judy is receiving them now.
Make sure missing individuals are asked to participate and remove unnecessary participants	CBear AD'Entremont	Ongoing	We have continued to revise invites and add SMEs.
Jurisdictions to send bullet points of their planned public reach activities for the next five years and anything they have done to date (public interactions, presentations, etc.)	All Jurisdictions	By Oct. 1	Judy will incorporate into the doc. Template on doc share.
Archived			
Send each jurisdiction their information – Community Descriptions and Mitigation Strategy	CBear SAustin	Complete	Sent with 5/24 email to participants
Edit Pima County Unincorporated Community Description	AD'Entremont	By June Meeting	Done
Verify Tucson Airport Authority and their place in the plan potentially as a "jurisdiction."	Sue Austin	Done	Sue is having Mitigation Grants person contact Jeff Horton for further information on what they will need to add to plan.
Devise a method for updating any reference and resource documents that the jurisdictions used for updating their information.	Courtney Bear Andy D'Entremont	Done	Asking that all edits are done in "Review: Track Changes" mode in Microsoft Word.
Create a way to track the "Local Planning Resources" for the documentation.	CBear AD'Entremont	Done	Listing of people that assisted as SMEs to be completed by jurisdictions and returned to PCOEM. Document on doc share.

Post the current draft and information on how the public can comment on the Pima County website during comment periods.	Judy Lynn	Done	Plan posted by CBear on 5/24. Jlynn has draft public comment complete 5/20. Judy sent live link and verbiage to team on 8/5.
Find a lead to gather population and economy data or do it ourselves by jurisdiction.	CBear to speak with PAG	Complete	Met with Pima County GIS and PAG and had a Data and Maps subteam meeting. Data, tables and maps will be tracked on a spreadsheet. As of 7/27, PAG has the document from Pima County GIS. PAG returned population data.
Send out the mitigation table format for jurisdictions to revise.	CBear	Done	Reposted blank to doc share on 8/11.



**Pima County
Hazard Mitigation Plan Update Meeting #3
August 24th, 2016 – 9am to noon
3434 E. 22nd Street, Tucson, AZ**

AGENDA

- Welcome & Introductions – Courtney
- Overview of Public Outreach Progress – Judy
- Update from Jurisdictions on CPRI, Risks & Hazards
- Maps and Data Update - Courtney
- Review of Mitigation Strategy – Sue
 - Detailed look at Section 5
 - Decide what stays and what goes
 - Discuss jurisdictional mitigation strategies
- Next Meeting
- Adjourn

PIMA COUNTY
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

2017

Pima County Multi-Jurisdictional Hazard Mitigation Plan

Third Planning Meeting

Rm 308

August 24, 2016
9am to Noon

Badge -	Initial	Name	Jurisdiction/Agency/Organization	Office Phone	Cell Phone	E-mail Address
✓ 1012	CA	Ackerman, Char	Oro Valley			cackerman@orovalleyaz.gov
		Ailred, Kaleb	Town of Sahuarita			kallred@sahuaritaaz.gov
✓ 1013	SA	Austin, Sue	State of Arizona			Susan.Austin@azdema.gov
		Baldwin, Kerry	Pima County			kerry.baldwin@pima.gov
	CRB	Bear, Courtney	Pima County	520-724-9315	520-528-5219	courtney.bear@pima.gov
		Carbajal, Manny	Marana	520-382-1972	520-3608795	mcarbajal@maranaaz.gov
		Casertano, Paul	Pima Association of Governments			pcasertano@pagnet.org
✓ 017	SW	Chalmers, Seth	Pima County			seth.chalmers@pima.gov
✓ 1016	KC	Chavez, Kathy	Pima County			kathy.chavez@pima.gov
		Coyle, Jennifer	Pima County			jennifer.coyle@pima.gov
		D'Entremont, Andy	Pima County	520-724-9317	520-405-4128	Andrew.D'Entremont@pima.gov
		Drozd, Ken	NOAA		520-429-9450	kenneth.drozd@noaa.gov
✓ 1001	SE	Espinoza, Sandra	State of Arizona	520-628-5330	602-677-6914	sandra.espinoza@azdema.gov
		Faas, Jim	Pima County	520-724-3078	520-419-0476	jim.faas@pima.gov
		Gastelum, Joel	City of South Tucson			jgastelum@southtucson.org
		Geitner, Ian	Pascua Yaqui			ian_geitner@pascuayaqui-nsn.gov
		Glenn, Erik	Pima County			Erik.Glenn@pima.gov
✓ 1009	BC	Grosclose, Brian	Town of Sahuarita	520-344-7000		bgrosclose@ci.sahuaritaaz.gov
✓ 1008	MF	Hammarstrom, Mike	City of Tucson	520-837-7901	520-247-2381	mike.hammarstrom@tucsonaz.gov
		Helfrich, Thomas	Pima County	520-724-4650	520-449-3637	tom.helfrich@pima.gov
✓ 1004	JA	Horton, Jeff	Tucson Airport Authority	520-573-8108	520-406-2725	jhorton@flytucson.com
		Johnson, Eric	Pima County			eric.johnson@pima.gov

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PIMA COUNTY
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

2017

Pima County Multi-Jurisdictional Hazard Mitigation Plan

Third Planning Meeting

Rm 308

August 24, 2016
9am to Noon

Badge	Initial	Name	Jurisdiction/Agency/Organization	Office Phone	Cell Phone	E-mail Address
		Johnson, Steve	Marana	520-382-2034		sjohnson@maranaaz.gov
		Johntson, Tom	Sahaurita	520-344-7000		tjohnston@sahuaritaaz.gov
		Karasz, Sarah	State of Arizona	520-383-4250		SKarasz@azdot.gov
✓ 6	JJK	Karlik, Jay	Rural/Metro Fire Department	520-603-5659	520-730-7157	jay.karlik@rmetro.com
		Khawam, Yves	Pima County			Yves.Khawam@pima.gov
		Ladd, Kieth	University of Arizona			ladd@email.arizona.edu
		Lakosky, Cory	City of South Tucson	520-235-9382		Clakosky@southtucson.org
		Langdale, Paul	State of Arizona	520-388-4251		plangdale@azdot.gov
		Lauber, Brian	State of Arizona		520-840-1615	BrianLauber@azsf.gov
		Lopez, Eduard	Town of Sahuarita			elopez@sahuaritaaz.gov
	MD	Lynn, Judy	Pima County	520-724-9309	520-279-1507	judy.lynn@pima.gov
		Manos, Michele	Pima County	520-724-7953		michele.manos@pima.gov
✓ 018	AW	Matus, Andre	Pascua Yaqui			andre.matus2@pascuayaqui-nsn.gov
		Mercer, Rita	Pima County	520-724-6359	520-282-1882	rita.mercer@pima.gov
		Miranda, Richard	Pima County	520-724-6167	520-850-1548	richard.miranda@pima.gov
-	qpm	Moya-Flores, Griselda	Pima County	570-724-9314	520-241-5226	Griselda.Moya-Flores@pima.gov
		Nassi, Richard	Pima Association of Governments			massi1@gmail.com
		Nunes, John	Vail School District			nunesj@vailschooldistrict.org
		Pacheco, Aaron	Pima County			Aaron.Pacheco@pima.gov
		Padilla, Robert	Pima County	520-724-5235	520-419-0124	robert.padilla@pima.gov
		Porter, Scott	Pima County	520-724-7383		Scott.Porter@pima.gov
		Robinson, Julie	Pima County			julie.robinson@pima.gov

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PIMA COUNTY
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

2017

Pima County Multi-Jurisdictional Hazard Mitigation Plan

Third Planning Meeting

Rm 308

August 24, 2016
9am to Noon

Badge	Initial	Name	Jurisdiction/Agency/Organization	Office Phone	Cell Phone	E-mail Address
		Rodriguez, Bernice	Pascua Yaqui			bernice.e.rodriguez@pascuayaqui-nsn.gov
		Romero, Lisa	Pima County	520-724-9312		lisa.romero@pima.gov
✓ 007	RS	Saxe, Greg	Pima County	520-724-4600		greg.saxe@pima.gov
✓ 003	NS	Selover, Nancy	Arizona State University	480-965-0580	602-377-6777	selover@asu.edu
		Shepp, Eric	Pima County	520-724-4610		eric.shepp@pima.gov
✓ 014	MS	Siemsen, Nick	City of Tucson	520-837-7380		Nicolas.Siemsen@tucsonaz.gov
		Smith, Allen	City of Tucson	520-837-7463		allen.smith@tucsonaz.gov
		Stengel, Gary	Pima County			gary.stengel@sheriff.pima.gov
		Thum, Gabe	Pima Association of Governments	520-792-1093		gthum@pagregion.com
	(LV)	Valenzuela, Louie	Pima County	520-724-7749	520-784-4036	Louie.Valenzuela@pima.gov
		Wagner, Doug	Tucson Airport Authority	520-573-5115	480-721-7683	dwagner@flytucson.com
		Youberg, Ann	State of Arizona	520-770-3500		ann.youberg@azgs.az.gov
		Bowen, Shada	Town of Sahuarita	520-344-7100	520-664-5150	Sbowen@sahuaritaaz.gov
✓ 023	A	PORTER, P. SCOTT	PIMA COUNTY DEO	520-724-9383		SCOTT-PORTER@PIMA.GOV
	CS	Chavez, Sergio	PCOEWI			

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Meeting Notes

Pima County Hazard Mitigation Plan Meeting #4

Aug 24, 2016, 2016 – 9am to Noon

3434 E. 22nd Street, Tucson, AZ

- Welcome & Introductions – Courtney Bear, Pima County OEM Ops Mgr
- Introductions – in attendance:
 - Char Ackerman – Town of Oro Valley Emergency Management
 - Sue Austin – Arizona Department of Emergency & Military Affairs
 - Courtney Bear – Pima County Office of Emergency Management
 - Sheila Bowen – Town of Sahuarita
 - Seth Chalmers – Pima County DOT
 - Kathy Chavez – Pima County Office of Sustainability
 - Sandra Espinoza – Arizona Department of Emergency & Military Affairs
 - Brian Groseclose – Town of Sahuarita
 - Mike Hammarstrom – Tucson Police Department
 - Jeff Horton – Tucson Airport Authority
 - Jay Karlik – Rural/Metro Fire Department
 - Judy Lynn – Pima County Office of Emergency Management
 - Andre Matus – Pascua Pueblo Emergency Management
 - Griselda Moya-Flores – Pima County Office of Emergency Management
 - Scott Porter – Pima County Environmental Quality
 - Greg Saxe – Pima County Regional Flood Control
 - Nancy Selover – Arizona State University
 - Nick Siemsen – City of Tucson Emergency Management
 - Simran Singh – Pima County Office of Emergency Management
- Update of Public & Stakeholder Involvement – Judy Lynn
 - No public feedback as of yet.
 - Proof of public posting is PAST DUE as of 8/24. Please provide Judy a copy of your site or other postings ASAP.
 - Discussed again the public and stakeholder involvement and tracking. **TASK DUE**
September 9th: Jurisdictions to send bullet points of their planned activities for the next five years and anything they have done to date (public interactions, presentations, etc.) File is available on the [documents drive](#). Oro Valley is in.
 - Jurisdictions need to continue to promote public outreach via education, awareness of hazards, training, etc. throughout the community.
- Review of GIS and Data Meeting

- Discussed “critical infrastructure” and how this differs in mitigation from what many of us are used to on the homeland security protection front.
- Each jurisdiction is responsible for listing their CI. TASK: Greg Sax will provide a statement for the document for flooding on how this will work for use with the NFIP.
- Courtney will work with Erik Glen and Greg to make sure we have what we need for the HAZUS data table for flooding.
- Update from Jurisdictions on your Community Descriptions
 - Not all Community Descriptions have been returned. TASK: Missing jurisdictions need to be in by Sept. 16th.
- Mitigation Actions
 - Discussed the critical infrastructure lists again – include utilities, communication, fire, hospital, police, etc. If there would be a debilitating effect on the community if it was damaged or destroyed, it should be listed. Use the tables in the 2012 plan and the *Critical Infrastructure Flood 2012* Excel file Nick created located on the documents drive as a reference for your needs. He will not be updating it this year, but contact him if you want to have more details.
 - Sue recommended removing a lot of the details from the 5.3 Capability Assessment Section. TASK: Each jurisdiction needs to review their Technical Staff, Legal and Regulatory Capabilities, and Fiscal Capabilities tables and return by September 16th. Cut and paste or edit from the posted *Mitigation Only 2016* Word file document is fine.
 - Sue went through several items in the Section 5 that aren’t needed or can be compiled in test format.
 - Sue discussed the completion of the 5.9.x *Mitigation Measures for XXX* table – “AP’s” in the documents file for each jurisdiction. TASK: Each jurisdiction needs to complete the table and return by Sept. 16th, 2016.
 - Each of these tables will be archived in the appendix and the new 5.9.x table of active mitigation activities for 2017 plan will be put into Section 5.
 - Make sure activities are actionable – make them SMART – Specific, Measurable, Achievable, Relevant and Timely.
 - Anything you are deleting, just give a short reason why, “no funding,” “this is response, so it was removed,” etc.

- Everyone should review Mitigation Ideas booklet from FEMA to get their mitigation ideas together and added to their mitigation measures table. Remember, try to focus on mitigation, not planning, response or recovery actions. You will not be held to these and they can be vague as to specific location and time.
- If you are participating in another jurisdiction’s action – you can chose “education and outreach” as your portion of participation. For example, Oro Valley can choose education and outreach on the county’s drought plan.
 - Discussed CPRI’s – TASK: each jurisdiction needs to complete and send in the table by 9/9/2016. When they do highlight their chosen hazards somehow. Any hazards or risks that the jurisdictions haven’t chosen can be dropped from the plan.
- After the meeting, we spoke with Sue about timelines. Anyone who is missing deadlines will be given warnings, Courtney will track, non-participating jurisdictions will be sent an official letter warning that they have to be participating by a certain date or they will be left out of the plan. Courtney will be using a spreadsheet to track items that are being returned and missing.
- See Task Table and Current Status Table below. Let Courtney know if we are missing something.
- All documents posted at:
<http://webcms.pima.gov/cms/One.aspx?pageId=268195&objectId.16949=268199&contextId.16949=268198>
- Adjourn
- Next Meeting – October 13th at 1300 at the PECOC – topic will discussion of jurisdictional mitigation ideas, review of progress so far, plan revision.

Task Table:

Task:	Assigned to:	Due by:	Status/Notes:
Archive the copies of the articles they publish and send them to Judy for incorporation into the final document.	Jurisdictions	PAST DUE	Judy is receiving them now. Several jurisdictions are missing. This MUST be done to meet plan requirements.
Jurisdictions to send bullet points of their planned public reach activities for the next five years and anything they have done to date (public interactions, presentations, etc.)	All Jurisdictions	By 9/9/2016	Judy will incorporate into the doc. Template on doc share.

Edit Community Descriptions	Each Jurisdiction	09/9/2016	Don't spend a lot of time here, clean up and revise per SAustin. Send in by 09/16 for incorporation.
Report status and disposition of mitigation strategies and enter new actions.	All jurisdictions	09/16/2016	Complete 5.2.x table for your jurisdiction
Jurisdictions need to decide what hazards they are going to keep after finishing their CPRI.	All Jurisdictions	9/9/2016	CPRI complete by 8/24. Make sure and rank top hazards that you are choosing and highlight when you return your CPRI
Complete Capability Assessment Tables	All Jurisdictions	9/16/2016	Consists of Technical Staff, Legal and Regulatory Capabilities, and Fiscal Capabilities tables in the Mitigation Section 5 documents.
Complete Local Resources Table	All Jurisdictions	10/1/2016	Sent to jurisdictions on 8/31.
Break out hazards and send to SMEs	PCOEM	9/9/2016	Give them three weeks to edit before going to the team.
Meet with GIS and Flood and complete CI table	PCOEM	9/9/2016	HAZUS-MH is on PCEOC computer
Share public notices through social media and other venues (e.g. newspaper articles, public notices, etc.)	All Jurisdictions PCOEM	Ongoing	Ongoing beginning August 1 st .
Manage electronic feedback from the comment periods and ensure it is routed to the appropriate jurisdiction.	JLynn	Ongoing	Judy will forward as appropriate. All follow up should be returned to Judy for documentation. Any other relevant interactions should be forwarded to Judy to document.
Make sure missing individuals are asked to participate and remove unnecessary participants	CBear AD'Entremont	Ongoing	We have continued to revise invites and add SMEs.
Archived			
Send each jurisdiction their information -- Community Descriptions and Mitigation Strategy	CBear SAustin	Complete	Sent with 5/24 email to participants
Edit Pima County Unincorporated Community Description	AD'Entremont	By June Meeting	Done
Verify Tucson Airport Authority and their place in the plan potentially as a "jurisdiction."	Sue Austin	Done	Sue is having Mitigation Grants person contact Jeff Horton for further information on what they will need to add to plan.

Devise a method for updating any reference and resource documents that the jurisdictions used for updating their information.	Courtney Bear Andy D'Entremont	Done	Asking that all edits are done in "Review: Track Changes" mode in Microsoft Word.
Create a way to track the "Local Planning Resources" for the documentation.	CBear AD'Entremont	Done	Listing of people that assisted as SMEs to be completed by jurisdictions and returned to PCOEM. Document on doc share.
Post the current draft and information on how the public can comment on the Pima County website during comment periods.	Judy Lynn	Done	Plan posted by CBear on 5/24. Jlynn has draft public comment complete 5/20. Judy sent live link and verbiage to team on 8/5.
Need to look at Flood HAZUS to see if it would meet the NFIP program needs.	Greg Saxe AD'Entremont CBear E Glenn	On the computer	Decided to keep the data for flooding in the table to meet the NFIP needs. Plan to put ARC-GIS and HAZUS on a PCEOC computer by 8/19 where multiple people can access it.
Find a lead to gather population and economy data or do it ourselves by jurisdiction.	CBear to speak with PAG	Complete	Met with Pima County GIS and PAG and had a Data and Maps subteam meeting. Data, tables and maps will be tracked on a spreadsheet. As of 7/27, PAG has the document from Pima County GIS. PAG returned population data.
Send out the mitigation table format for jurisdictions to revise.	CBear	Done	Reposted blank to doc share on 8/11.

Current Task Status Table:

	Pub Inv Web Posting	CPRI Return ed w/ Hazard s Ranke d and Chosen	Pub Inv Past & Future	Communit y Desc	Capabilit y Assesse ment - Tech Staff, Legal/Reg Cap, and Fiscal Cap	Prev Mit Status Sheet	Local Resource s	New Mitigation Complete
Due	8/24/16	9/9/16	9/9/16	9/16/16	9/16/16	9/16/16	10/1/16	10/15/16
Pima Unincorp	x	x	x	x			x	
Tucson	x			x				
Marana				x				
Oro Valley	x			x				
Sahuarita								
South Tucson								
Pasqua Yaqui								

Courtney Bear

Subject: MJHMP Planning Meeting
Location: PCEOC 3434 E. 22nd Ave. Tucson, AZ 85713 Room 308

Start: Wed 10/12/2016 1:00 PM
End: Wed 10/12/2016 3:00 PM

Recurrence: (none)

Meeting Status: Meeting organizer

Organizer: Courtney Bear
Required Attendees: Jeff Guthrie; Charlotte Ackerman; 'kallred@sahuaritaaz.gov'; Kerry Baldwin; 'pcasertano@pagnet.org'; Seth Chalmers; Jennifer C. Coyle; Andrew D'Entremont; 'kenneth.drozdn@noaa.gov'; 'sandra.espinoza@azdema.gov'; Jim Faas; Erik Glenn; 'Brian Groseclose (bgroseclose@sahuaritaaz.gov)'; 'mike.hammarstrom@tucsonaz.gov'; Tom Helfrich; 'jhorton@flytucson.com'; Eric Johnson; 'SKaras@azdot.gov'; 'jay.karlik@rmetro.com'; Yves Khawam; 'Clakosky@southtucson.org'; 'plangdale@azdot.gov'; 'BrianLauber@azsf.gov'; Judy Lynn; Michele Manos; Rita Mercer; Richard Miranda; Grise'lda Moya-Flores; 'massi1@gmail.com'; Aaron Pacheco; Robert Padilla; Scott Porter; 'bernice.e.rodriguez@pascuayaqui-nsn.gov'; Lisa Romero (PECOC); Greg Saxe; 'selover@asu.edu'; Eric Shepp; 'Nicolas.Siensen@tucsonaz.gov'; 'allen.smith@tucsonaz.gov'; Gary Stengel; 'gthum@pagregion.com'; Louie Valenzuela; 'dwagner@flytucson.com'; 'ann.youberg@azgs.az.gov'; 'Susan Austin'; Gary Stengel; Lauren Ortega; Julie Robinson; 'ladd@email.arizona.edu'; Kathy Chavez; Andre Matus; 'trisha.pearce@va.gov'; 'Youberg, Ann M. - (ayouberg)'; Andre Matus; 'jgastelum@southtucson.org'; 'Eduard Lopez'; 'sbowen@sahuaritaaz.gov'; 'Manny Carbajal'; Steve Johnson; rremington@logansimpson.com; eroudebush@flytucson.com; Doug Siegel

Optional Attendees: 'Jacinta Figueroa'

Categories: Plans

Hello,

I apologize for this, but a priority meeting was scheduled after I scheduled this one. There were too many conflicts, so I'm moving to Oct. 12th at 1300. That will be convenient for those of you who will be at our Local Emergency Planning Committee meeting that morning.

I've attached the latest Assignment Status. I've been in contact with most of you about your situations. Great efforts have been made of the last two weeks and I appreciate it.

The agenda for the 12th will be reviewing our mitigation projects. Please have at your draft ideas on your AP Status sheets back by then so we can consolidate and review with Sue.

As a note, if you have locals who have a stake in your mitigation actions, please bring them along as well. I encourage the Pima County personnel who are interested to attend also. Or any of our partners who we haven't seen in a while. This might help us find a few more meaningful mitigation measures. We will try and get a summary early that week to review.

As always, you can find all past and current materials at:

<http://webcms.pima.gov/cms/One.aspx?pageId=268195&objectId.16949=269598&contextId.16949=268198&parentId.16949=268203>

See you then,

Courtney

Courtney Bear

Operations Manager

Pima County Office of Emergency Management

3434 E. 22nd Street, Suite A

Tucson, AZ 85713

520-528-5219 (cell) | 520-724-9315 (office)

520-724-9300 (main) | 520-724-9310 (fax)



PIMA COUNTY

MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

2017

Pima County Multi-Jurisdictional Hazard Mitigation Plan

Fourth Planning Meeting

October 12, 2016
1:00-3:00

Badge	Initial	Name	Jurisdiction/Agency/Organization	Department/Division/Branch	Title	Office Phone	Cell Phone	E-mail Address
✓ 0001	CO	Richard, Char	Oro Valley	CVPD				charlesr@orovalley.gov
		Alfred, Kaleb	Town of Sahuarita	Police Department	Commander			kalfred@tahuarita.gov
✓ 0018	GA	Aurich, Sue	State of Arizona	Department of Military and Emergency Affairs	Mitigation Planner			Sue.Aurich@azdema.gov
		Baldwin, Kerry	Pima County	Natural Resources/Parks & Rec				kerry.baldwin@pima.gov
		Beas, Courtney	Pima County	Office of Emergency Management	Operations Manager	520-724-9915	520-529-5219	courtney.beas@pima.gov
		Carbajal, Wency	Maricopa	Office of Emergency Management	Emergency Management Coordinator	520-392-1972	520-3687955	wency.carbajal@maricopa.gov
✓ 0003	AC	Casarrano, Paul	Pima Association of Governments					pcasarrano@paso.org
		Chambers, Seth	Pima County	Department of Transportation				seth.chambers@pima.gov
		Chaves, Kathy	Pima County	Office of Sustainability				kathy.chaves@pima.gov
		Coyte, Heather	Pima County	Regional Wastewater Reclamation				heather.coyte@pima.gov
		D'Eonment, Andy	Pima County	Office of Emergency Management	Program Coordinator	520-724-9917	520-405-4128	andy.d'eonment@pima.gov
✓ 4	DB	Dreed, Ken	NOMA	National Weather Service				ken@dreed.com
✓ 23	DC	Edwards, Sandra	State of Arizona	Department of Military and Emergency Affairs	South Region Field Coordinator	520-626-3330	602-677-8914	sandra.edwards@azdema.gov
		Falk, Jim	Pima County	Finance and Risk Management	Environmental Services Officer	520-724-3078	520-419-0475	Jim.Falk@pima.gov
		Gascoigne, Joel	City of South Tucson		Director			jgascoigne@southtucson.org
		Gibson, Ian	Pezcua Yagui	Land Use				ian.gibson@pezcua.org
		Gleason, Erik	Pima County	Information Technology	Senior GIS Analyst			erik.gleason@pima.gov
		Grossberg, Brian	Town of Sahuarita	Police Department		520-344-7000		brian.grossberg@tahuarita.gov
		Hammertson, Mike	City of Tucson	Police Department	Lieutenant	520-887-7901	520-247-2381	mike.hammertson@tucson.gov
		Helfrich, Thomas	Pima County	Regional Flood Control	Division Manager	520-724-4650	520-448-3637	tom.helfrich@pima.gov
		Horton, Jeff	Tucson Airport Authority	Public Safety/Operations/Communication	Director of Airside Ops & Comm	520-573-8108	520-406-7725	jeff.horton@tucson.com
		Johanson, Eric	Pima County	Sheriff's Office	Captain			eric.johanson@pima.gov
		Johanson, Steve	Maricopa	Police Department	Sergeant	520-380-2084		steve.johanson@maricopa.gov
		Johanson, Tom	Sahuarita	Police Department	Officer	520-344-7000		tom.johanson@tahuarita.gov
		Karas, Sarah	State of Arizona	Department of Transportation	Environmental Planning - PMG	520-389-4250		sarah.karas@dot.az.gov
		Kerlik, Jay	Rural/Metro Fire Department	Fire Department	Battalion Chief	520-623-5669	520-750-7157	jay.kerlik@metro.com
		Khawari, Yves	Pima County	Development Services	Chief Building Official			yves.khawari@pima.gov
		Loda, Klesh	University of Arizona		Chief	520-235-9882		klesh.loda@u.arizona.edu
		Lukosky, Cory	City of South Tucson	Fire Department				cory.lukosky@southtucson.org
		Lugubale, Paul	State of Arizona	Department of Transportation	Environmental Planning Policy Advisor	520-388-4251		paul.lugubale@dot.gov
		Lutber, Brian	State of Arizona	Forestry Division	Special Projects		520-940-1615	brian.lutber@azdema.gov
		Lopez, Edward	Town of Sahuarita	Police Department	Commander			edward.lopez@tahuarita.gov
		Lynn, Judy	Pima County	Office of Emergency Management	Community Outreach Coordinator	520-724-9309	520-279-1507	judy.lynn@pima.gov
		Maros, Michele	Pima County	Health Department	Senior Consultant	520-724-7963		michele.maros@pima.gov

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PIMA COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

2017

Pima County Multi-Jurisdictional Hazard Mitigation Plan

Fourth Planning Meeting

October 12, 2016
1300-1500

Badge	Initials	Name	Jurisdiction/Agency/Organization	Department/Division/Branch	Title	Office Phone	Cell Phone	Email Address
✓012	AM	Matus, Andre	Pascua Yaqui	Fire Department	Chief			andre.matus@pascuayaqui-nsn.gov
		Mercer, Rita	Pima County	Regional Wastewater Reclamation	Program Manager	520-724-6959	520-282-1882	rita.mercer@pima.gov
		Miranda, Richard	Pima County	Regional Wastewater Reclamation	Program Manager	520-724-6167	520-850-1548	richard.miranda@pima.gov
		Moya-Flores, Griselda	Pima County	Office of Emergency Management	Administrative Specialist	570-724-9314	520-241-5226	Griselda.Moya-Flores@pima.gov
		Nassi, Richard	Pima Association of Governments	Transportation				rnassi1@gmail.com
		Nunes, John	Vail School District	Transportation & Emergency Management	Director			nunesj@vailschooldistrict.org
		Pacheco, Aaron	Pima County	Health Department				Aaron.Pacheco@pima.gov
		Padilla, Robert	Pima County	Natural Resources/Parks & Rec	Deputy Director	520-724-5235	520-439-0124	robert.padilla@pima.gov
		Porter, Scott	Pima County	Environmental Quality	Manager	520-724-7383		Scott.Porter@pima.gov
✓010	AP	Robinson, Julie	Pima County	Office of Sustainability				julie.robinson@pima.gov
✓006	AM	Rodriguez, Bernice	Pascua Yaqui					bernice.e.rodriguez@pascuayaqui-nsn.gov
		Romero, Liss	Pima County	Office of Emergency Management	Administrative Support	520-724-9312		liss.romero@pima.gov
		Saxe, Greg	Pima County	Regional Flood Control	Environmental Planning Manager	520-724-4600		greg.saxe@pima.gov
		Selover, Nancy	Arizona State University	Arizona State Climate Office	State Climatologist	480-965-0580	602-377-6777	selover@asu.edu
		Shepp, Eric	Pima County	Regional Flood Control	Flood Plain Administrator	520-724-4630		eric.shepp@pima.gov
✓005	NR	Siemsen, Nick	City of Tucson	Fire Department	Emergency Management Coordinator	520-837-7380		Nicolas.Siemseh@tucsonaz.gov
		Smith, Allen	City of Tucson	Police Department	Sergeant	520-837-7463		allen.smith@tucsonaz.gov
		Stenzel, Gary	Pima County	Sheriff's Office	Captain			gary.stenzel@sheriff.pima.gov
		Thum, Gabe	Pima Association of Governments	Transportation Safety	Program Coordinator	520-792-1093		gthum@pazregion.com
		Valenzuela, Louie	Pima County	Health Department	Preparedness Coordinator	520-724-7749	520-784-4036	Louie.Valenzuela@pima.gov
		Wagner, Doug	Tucson Airport Authority	Planning & Development	Project Manager	520-573-5115	480-721-7683	d.wagner@tvtucson.com
		Youberg, Ann	State of Arizona	AZ Geological Survey		520-770-3500		ann.youberg@azgs.gov
✓003	HS	Smith, Kelly	DEMA					
✓007		MALONE, MAT	SAHUARITA PD		ET	344.7000	940-6994	MATMALONE@SAHUARITAPD.ORG
✓11	AM	Bowen, Shula	Sahuarita					
✓13	JT	FIGUEROA, AZULITA	Pascua Yaqui Tribe		ATT	883-5085		

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Meeting Notes

Pima County Hazard Mitigation Plan Meeting #5

Oct 12, 2016, 1pm to 3pm

3434 E. 22nd Street, Tucson, AZ

- **Welcome & Introductions – Courtney Bear, Pima County OEM Ops Mgr**
- **Introductions – in attendance:**
 - Char Ackerman – Town of Oro Valley Emergency Management
 - Sue Austin – Arizona Department of Emergency & Military Affairs
 - Courtney Bear – Pima County Office of Emergency Management
 - Sheila Bowen – Town of Sahuarita
 - Seth Chalmers – Pima County DOT
 - Sandra Espinoza – Arizona Department of Emergency & Military Affairs
 - Juanita Figueroa – Pascua Yaqui Tribe
 - Steve Johnson -- Town of Marana
 - Andre Matus – Pascua Pueblo Emergency Management
 - Matt McGlown – Town of Sahuarita Police Department
 - Julie Robinson – Pima County Office of Sustainability
 - Bernice Rodriguez – Pascua Pueblo Emergency Management
 - Nancy Selover – Arizona State University
 - Nick Siemsen – City of Tucson Emergency Management
 - Simran Singh – Pima County Office of Emergency Management
 - Hollie Smith – Arizona Department of Emergency & Military Affairs
- **Overview of Public Outreach Progress**
 - No public feedback still.
 - Proof of public posting is caught up.
 - Discussed again the public and stakeholder involvement and tracking. Most everyone has returned.
 - Jurisdictions need to continue to promote public outreach via education, awareness of hazards, training, etc. throughout the community.
- **Update on CPRI, Risks & Hazards**
- **Maps and Data Update**
 - HAZUS has been downloaded and Erik and Greg will be working on the flood data. There are no resources to go through the 2012 data on critical infrastructure that COT completed.
- **Review of Mitigation Actions**
- **Community Descriptions**

- All have been returned.
- CPRI Tables
 - The tables are all back, but a few jurisdictions didn't show which hazards they were choosing or order by score.
- Mitigation Actions
 - Discussed, again, to make sure activities are actionable – make them SMART – Specific, Measurable, Achievable, Relevant and Timely.
 - Anything you are deleting, just give a short reason why, “no funding,” “this is response, so it was removed,” etc.
 - If you are participating in another jurisdiction’s action – you can choose “education and outreach” as your portion of participation. For example, Oro Valley can choose education and outreach on the county’s drought plan.
- Discussion of Remaining Activities
- Timeline and Due Dates
- Next Meeting – no more meetings per the team. Items will be followed up on by email or phone or separate jurisdictional meeting.
- See Task Table and Current Status Table below. Let Courtney know if we are missing something.
- All documents posted at:
<http://webcms.pima.gov/cms/One.aspx?pageId=268195&objectId.16949=268199&contextId.16949=268198>
- Adjourn

Task Table:

Task:	Assigned to:	Due by:	Status/Notes:
Report status and disposition of mitigation strategies and enter new actions.	All jurisdictions	10/12/2016	Ongoing
Jurisdictions need to decide what hazards they are going to keep after finishing their CPRI.	All Jurisdictions	9/9/2016	Complete as of this meeting
Complete Capability Assessment Tables	All Jurisdictions	9/16/2016	All have been returned as of 10/20
Complete Local Resources Table	All Jurisdictions	10/1/2016	All have been returned as of 10/20

Break out hazards and send to SMEs	PCOEM	9/9/2016	Ongoing
Meet with GIS and Flood and complete CI table	PCOEM	10/20/2016	HAZUS-MH is on PCEOC computer. Eric will see if this will work. Courtney to get data on CI from DHS.
Share public notices through social media and other venues (e.g. newspaper articles, public notices, etc.)	All Jurisdictions PCOEM	Ongoing	Ongoing beginning August 1 st .
Manage electronic feedback from the comment periods and ensure it is routed to the appropriate jurisdiction.	JLynn	Ongoing	Judy will forward as appropriate. All follow up should be returned to Judy for documentation. Any other relevant interactions should be forwarded to Judy to document.
Archived			
Send each jurisdiction their information – Community Descriptions and Mitigation Strategy	CBear SAustin	Complete	Sent with 5/24 email to participants
Edit Pima County Unincorporated Community Description	AD'Entremont	By June Meeting	Done
Verify Tucson Airport Authority and their place in the plan potentially as a "jurisdiction."	Sue Austin	Done	Sue is having Mitigation Grants person contact Jeff Horton for further information on what they will need to add to plan.
Devise a method for updating any reference and resource documents that the jurisdictions used for updating their information.	Courtney Bear Andy D'Entremont	Done	Asking that all edits are done in "Review: Track Changes" mode in Microsoft Word.
Create a way to track the "Local Planning Resources" for the documentation.	CBear AD'Entremont	Done	Listing of people that assisted as SMEs to be completed by jurisdictions and returned to PCOEM. Document on doc share.
Post the current draft and information on how the public can comment on the Pima County website during comment periods.	Judy Lynn	Done	Plan posted by CBear on 5/24. JLynn has draft public comment complete 5/20. Judy sent live link and verbiage to team on 8/5.
Need to look at Flood HAZUS to see if it would meet the NFIP program needs.	Greg Saxe AD'Entremont CBear E Glenn	On the computer	Decided to keep the data for flooding in the table to meet the NFIP needs. Plan to put ARC-GIS and HAZUS on a PCEOC

			computer by 8/19 where multiple people can access it.
Find a lead to gather population and economy data or do it ourselves by jurisdiction.	CBear to speak with PAG	Complete	Met with Pima County GIS and PAG and had a Data and Maps subteam meeting. Data, tables and maps will be tracked on a spreadsheet. As of 7/27, PAG has the document from Pima County GIS. PAG returned population data.
Send out the mitigation table format for jurisdictions to revise.	CBear	Done	Reposted blank to doc share on 8/11.
Make sure missing individuals are asked to participate and remove unnecessary participants	CBear AD'Entremont	Complete	Notices sent to non-participating jurisdictions week of 10/10 with no response.
Archive the copies of the articles they publish and send them to Judy for incorporation into the final document.	Jurisdictions	Done	Complete
Jurisdictions to send bullet points of their planned public reach activities for the next five years and anything they have done to date (public interactions, presentations, etc.)	All Jurisdictions	By 9/9/2016	Complete
Edit Community Descriptions	Each Jurisdiction	09/9/2016	Complete

Current Task Status Table:

	Pub Inv Web Posting	CPRI Returned w/ Hazards Ranked and Chosen	Pub Inv Past & Future	Communi ty Desc	Capability Assessme nt - Tech Staff, Legal/Reg Cap, and Fiscal Cap	Prev Mit Status Sheet	Local Resources	New Mitigation Complete
Due	8/24/2016	9/9/2016	9/9/2016	9/16/2016	9/16/2016	9/16/2016	10/1/2016	10/15/2016
Pima Unincorp	x	x	x	x	x	x	x	
Tucson	x	x		x	x	x	x	
Marana	x			x		x		
Oro Valley	x	x	x	x	x	x		
Sahuarita	x	x	x	x	x	x		
South Tucson								
Pasqua Yaqui				x				

APPENDIX D: ASSESSMENT OF PREVIOUS ACTION ITEMS

Table D-1: 2012 Mitigation Measures for Pima County								
Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Primary Agency	Potential Funding Source(s)	Status • No Progress • In Progress • Complete	Disposition • Keep • Delete • Keep, revise	Explanation or brief description of work so far or reason for 'no progress'
Enforce Flood & Erosion Hazard Ordinance in accordance with the NFIP.	Flood	\$1.2 million	Ongoing	RFCD / Floodplain Management Division	Flood Control tax Levy	In Progress	Keep	District staff including hydrologists, engineers and inspectors provides enforcement.
Implement NFIP tasks such as LOMR submittals, maintaining a countywide map repository, performing master drainage studies, and coordinating to insure the digital map is correct.	Flood	\$600,000	Ongoing	RFCD / Planning & Development Division	Flood Control Tax Levy	In Progress	Keep	District staff including GIS programmers, hydrologists, engineers and project managers provides map information services.
Arroyo Chico Multi-Use Project – Phase 2B (Basins 1, 2 & 3)	Flood	\$13.3 million	September, 2013	RFCD / Engineering Division	Flood Control Tax Levy & USACOE	Complete	Delete	Construction completed in 2015.
Inspection and preventative maintenance on levees as needed.	Levee Failure	\$50,000	Ongoing	RFCD / Infrastructure Management Division	Flood Control Tax Levy	In Progress	Keep	District inspectors monitor conditions at least annually and after floods.
Develop and implement multi-agency exercises and drills related to outbreaks of communicable illnesses and vector control.	Disease (Response)	Staff Time	12 months	Health Department Director	Grant Funds	In Progress	Remove	This is covered by Health Department Plans and Planning, not Mitigation.

Table D-1: 2012 Mitigation Measures for Pima County								
Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Primary Agency	Potential Funding Source(s)	Status • No Progress • In Progress • Complete	Disposition • Keep • Delete • Keep, revise	Explanation or brief description of work so far or reason for 'no progress'
Develop a Shelter in Place Plan (appendix to Pima County Emergency Operations Plan).	All (Response)	Staff Time	24 months	Pima County Office of Emergency Management and Homeland Security, Director	Grant Funds (as available)	Completed	Remove	This has been updated in the County EOP and integrated into the Response plan for hazardous materials.
Participate in Community Rating System to reduce insurance premiums.	Flood	\$50,000	Ongoing	RFCD / Planning & Development Division	Flood Control Tax Levy	In Progress	Keep	Pima County maintains a high rating and inclusion of flood hazards in this plan is a critical component of the score.
Buffelgrass Mitigation – identify public outreach opportunities, locate county areas for mitigation of buffelgrass and administer grant funding for ongoing activities related to wildfire reduction through removal and reduction in Buffelgrass.	Wildfire		Ongoing	Tucson Clean and Beautiful, Pima County Parks and Recreation	Mitigation Grants	In Progress	Keep	Working on completing a HMG and acquiring another grant.

**PIMA COUNTY
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN**

2017

Table D-2: 2012 Mitigation Measures for Marana								
Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Lead Agency	Potential Funding Source(s)	Status • No Progress • In Progress • Complete	Disposition • Keep • Delete • Keep, revise	Explanation or brief description of work so far or reason for 'no progress'
Provide training to the applicable Marana departments on the adopted hazard mitigation plan and its requirements.	All	\$500	2021	Emergency Management Coordinator	General Fund	In Progress	Keep	This will be a continuing process as staff changes
Conduct a public education campaign to increase awareness of natural hazards by distributing ADEMA and Pima County mitigation flyers at community events and public gathering opportunities, as appropriate. This will be accomplished semi-annually by Community Services.	All	\$500	2021	Community Development Director	General Fund	In Progress	Keep	This will be a continuing process and the Town grows
Encourage bridge or culvert construction where roads are susceptible to flooding. This will be accomplished as part of the Planning Process when Developers apply to build in Marana.	Flood	Staff Time	2016	Development Services/ General Manager	General Fund	In progress	keep	We look at this with each development and road project.
Marana will continue to participate in the National Flood Insurance Program by reviewing applications for buildings, ensuring they are properly designed.	Flood	Staff Time	2016	Development Services/ General Manager	General Fund	In progress	keep	This is an ongoing effort.

Table D-2: 2012 Mitigation Measures for Marana								
Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Lead Agency	Potential Funding Source(s)	Status • No Progress • In Progress • Complete	Disposition • Keep • Delete • Keep, revise	Explanation or brief description of work so far or reason for 'no progress'
Rattlesnake Pass from Saguaro Bloom to Twin Peaks Road.	Flood	\$29.8 Million	2018	Public Works / Director	Transportation Fund, General Fund	No progress	keep	This will be constructed by developer but the trigger has not been met
Barnett Linear Park and Flood Control – Construct a 3-mile channel along Barnett Road to mitigate the drainage and flood hazard from the Santa Cruz River	Flood	\$16.5 Million	2016	Public Works / Director	General Fund, Future MMPC Bonds	In progress	keep	Incrementally completed with each development along Barnett
Ina Road Bridge – Remove and replace the Ina Road bridge that crosses the Santa Cruz River	Flood	\$17.5 Million	2016	Development Services / Director	Transportation Fund, HURF Bonds, General Fund	In progress	revise	Completion date will be 2019
Ina Road Improvements from Silverbell Road to I-10 – widening of Ina Road to 4-lane section with raised median, sidewalks, and drainage improvements	Flood	\$16.5 Million	2016	Public Works/Director	Transportation Fund, Federal Grants	In progress	revise	Completion date will be 2019
Tangerine Road Corridor - provide a minimum of 4 lanes with raised medians, drainage improvements, sidewalks, ADA facilities, multi-use path and lanes, Traffic Signals, Right-of-Way acquisitions, Utility relocations, Marana Water	Flood	\$95.5 Million	2019	Public Works / Director	RTA, Future Bond Money	In progress	keep	Clarify that Phase I completion in 2018 and Phase II (DM Blvd. to I-10) to start construction in 2020

Table D-2: 2012 Mitigation Measures for Marana								
Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Lead Agency	Potential Funding Source(s)	Status • No Progress • In Progress • Complete	Disposition • Keep • Delete • Keep, revise	Explanation or brief description of work so far or reason for 'no progress'
line extensions, and sewer modifications and additions.								
Ina Road TI – lower I-10 and construct a new overpass that will span both I-10 and the UPRR tracks. Project will mitigate flood issues and also improve access that will reduce accidents and HazMat incidents	Flood, HazMat, Traffic Accidents	\$65.0 Million	2018	Public Works / Director in coordination with ADOT	ADOT, RTA	In progress	keep	Starting construction, TI to close in January 17' for two years
Marana will continue to participate in the Flood Prone Land Acquisition Program so we acquire properties located in flood hazard areas.	Flood	Staff	2016	Development Services/ General Manager	Grants, Partnership w/ Pima County	In progress	keep	There is no completion date so perhaps this could be changed to an "ongoing status."

Table D-3: 2012 Mitigation Measures for Oro Valley								
Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Lead Agency	Potential Funding Source(s)	Status • No Progress • In Progress • Complete	Disposition • Keep • Delete • Keep, revise	Explanation or brief description of work so far or reason for 'no progress'
Develop, implement, and update a mass evacuation strategy for Oro Valley (including training and exercising).	All (Response)	Staff Time	Annually, ongoing	Emergency Management and DIS	General Fund and grant	Complete	Delete	Preparedness. Oro Valley included in other regional evacuation plans such as the Pima County and statewide evacuation plans.
Develop, implement, and regularly update a Shelter in Place educational program (including training and exercising).	All (Response)	Staff Time	Annually, ongoing	Emergency Management	General Fund and grant	Complete	Delete	Preparedness. Shelter in place is included as part of regular town emergency management activities.
West Nile Virus Program Continued testing of mosquitoes for West Nile Virus. If a positive result, the area is sprayed.	Disease	\$5,000	Annually, ongoing	Stormwater Utility	Pima County Health Dept.; Stormwater Utility, and AZ Dept. of Health Zoonotic Diseases	Complete	Delete	This is an annual and ongoing program managed by the Pima County Health Department and no longer by the Town.

Table D-3: 2012 Mitigation Measures for Oro Valley								
Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Lead Agency	Potential Funding Source(s)	Status • No Progress • In Progress • Complete	Disposition • Keep • Delete • Keep, revise	Explanation or brief description of work so far or reason for 'no progress'
Buffelgrass Program actively educates and removes buffelgrass in public areas across the Town.	Wildfire	Staff and Volunteer Time	Annual, ongoing	DIS	General Fund, grant, and volunteer time	In progress	Keep	This is an annual and ongoing program.
Regularly update wildland-urban interface plans and educate communities about fire hazards.	Wildfire	Staff Time	Annual, ongoing	Golder Ranch Fire District	Golder Ranch	In progress	Delete	GRFD is developing and implementing a community risk reduction program that includes all hazards, planning, and education. That is included in a new mitigation action project in the plan update.
Widening of Lambert Lane between Pusch View Lane Bridge and La Canada Dr. will include drainage improvements to eliminate roadway flooding and debris.	Flood	\$8M	Sept. 2013	DIS	Pima Association Governments	Complete	Delete	Road project was completed in June 2013.
Public education and outreach about protecting pipes and irrigation systems from freezes.	Extreme Cold	Staff Time	Annual, ongoing	Oro Valley Water Utility	Water Utility Fees	Complete	Delete	Preparedness. This is an annual and ongoing program.
Applicable Hazmat training and exercising for first responders; as well as participation in multi-agency regional hazmat and decontamination teams.	HazMat	Staff Time and Training Costs	Annual, ongoing	Oro Valley Police Department and Golder Ranch	General Fund and Grant Funds	Complete	Delete	Preparedness. GRFD participates in agency specific and regional hazmat training and exercises.

Table D-3: 2012 Mitigation Measures for Oro Valley

Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Lead Agency	Potential Funding Source(s)	Status • No Progress • In Progress • Complete	Disposition • Keep • Delete • Keep, revise	Explanation or brief description of work so far or reason for 'no progress'
Town Cistern Project includes the addition of cisterns across the Town campus, water collected will be used for Town landscaping. Landscaping will be planned around the xeriscaping concept.	Drought	\$12,000	Annual, ongoing	DIS, Water, and Parks	General Fund and Private Funds	Complete	Delete	Project completed in August 2011.
Continue to develop, expand, and implement a Drought Response Plan to address potential or long-term drought conditions.	Drought	Staff Time	Annual, ongoing	Water Utility	General Fund	Complete	Delete	This is an annual and ongoing program.
Town of Oro Valley Stormwater Utility will continue to Manage Public Information Activities. <ul style="list-style-type: none"> • Monitor and maintain elevation certificates • Provide FEMA map information service • Conduct outreach projects to increase public awareness of flooding hazard promote flood insurance in general • Provide Flood protection information 	Flood	Staff Time and SW Utility Fees	Annually ongoing	Storm Water Utility, EM, Permitting Div., TOV Library	Storm Water Utility Fees	In progress	Keep	This is part of the annual and ongoing stormwater program.

Table D-3: 2012 Mitigation Measures for Oro Valley

Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Lead Agency	Potential Funding Source(s)	Status • No Progress • In Progress • Complete	Disposition • Keep • Delete • Keep, revise	Explanation or brief description of work so far or reason for 'no progress'
Conduct Floodplain Mapping and Regulatory Activities. <ul style="list-style-type: none"> • Manage/prepare LOMCs* for FEMA designated floodplains • Generate and collect additional (local) floodplain maps and information • Promote and enforce open space preservation • Enforce and augment regulatory floodplain standards • Manage town wide floodplain data • Oversee stormwater management program 	Flood	Staff Time and SW Utility Fees	Annually ongoing	Storm Water Utility	Storm Water Utility Fees	In progress	Keep	This is part of the annual and ongoing stormwater program.
Conduct Flood Damage Reduction Activities <ul style="list-style-type: none"> • Organize floodplain management planning doc. • Investigate acquisition and relocation of flood prone properties • Conduct and manage drainage system maintenance 	Flood	Staff Time and SW Utility Fees	Annually ongoing	Storm Water Utility	Storm Water Utility Fees	In progress	Keep	This is part of the annual and ongoing stormwater program.

Table D-3: 2012 Mitigation Measures for Oro Valley								
Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Lead Agency	Potential Funding Source(s)	Status • No Progress • In Progress • Complete	Disposition • Keep • Delete • Keep, revise	Explanation or brief description of work so far or reason for 'no progress'
Conduct Flood Preparedness Activities <ul style="list-style-type: none"> • Coordinate flood warning program w/PCRFC • Monitor levee safety for OV's certified levee 	Flood	Staff Time	Annually ongoing	Storm Water Utility	Storm Water Utility Fees	In progress	Keep	This is part of the annual and ongoing stormwater program.
Oro Valley Emergency Management will provide training to applicable Town staff on the adopted hazard mitigation plan and its requirements.	All	Staff Time	Annually, ongoing	All Town Departments and Emergency Management	General Fund and grant	Complete	Delete	Town staff education is part of the regular emergency management activities and will be provided again upon adoption of the plan.
Review existing Oro Valley General Plan and zoning code to determine how these documents help limit development in hazardous areas. Modify with additional guidelines, regulations, and land use techniques as necessary within the limits of state statutes, while also respecting private property rights.	All	Staff Time	Annually, ongoing	DIS	General Fund	Complete	Delete	This is an annual and ongoing component of the departmental roles and responsibilities. The General Plan 2016 is slated for vote in November 2016.

Table D-3: 2012 Mitigation Measures for Pascua Yaqui Tribe								
Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Lead Agency	Potential Funding Source(s)	Status • No Progress • In Progress • Complete	Disposition • Keep • Delete • Keep, revise	Explanation or brief description of work so far or reason for 'no progress'
Regional Flood Control Facilities Design was implemented with the 2004 Master Drainage Report. New tasks were completed such as topography, flood plain modeling and letter map revision.	Flood	Staff time	Ongoing and Continuous	Tribal Council Land Department	General Fund	In Progress	Keep	Drainage and culvert annual maintenance and repairs (small and large) to road projects.
Regional Flood Control Design, Phase 2 finalization.	Flood	Staff time	Ongoing and Continuous	Tribal Council Land Department	General Fund	In Progress	Keep	Cultural Survey, Design Plans, Cost Plans and Utility Relocation Plans were implemented in Phase 2. City of Tucson has approved Phase 1 but Phase 2 is still under review.
Continue the existing intergovernmental agreement between the Tribe and the State Forestry Department for assistance in the provision of emergency services within each other's jurisdictions.	Wildfire	Staff time	Continuing	*Fire Department *Attorney General's Office *Tribal Council	General Fund	In Progress	Keep	Completion of the Pima County Community Wildfire Protection Plan (CWPP) of 2013; completion of BIA Wild Fire Management Plan (WFMP) and, BIA Fuels Management Plan (FMP) of 2012

Table D-3: 2012 Mitigation Measures for Pascua Yaqui Tribe

Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Lead Agency	Potential Funding Source(s)	Status • No Progress • In Progress • Complete	Disposition • Keep • Delete • Keep, revise	Explanation or brief description of work so far or reason for 'no progress'
Review existing building codes to determine adequate protection for new development in hazard areas. Where feasible and necessary, modify codes to help mitigate hazards imposed on such development within the limits of the Reservation, while also respecting private property rights adjacent to the Reservation.	Extreme Temperature	Staff Time	Ongoing and Continuous	Tribal Council, Fire Department, Land Department, Housing Department	General Fund	In Progress	Keep	Install roofing materials with high reflectivity and high emittance ratings Install high performance windows that meet or exceed Energy Star criteria for "U" value and SHGC Improve "U" value of roof and wall systems by installing insulation which exceed current IECC requirements Install high efficiency HVAC with minimum SEER ratings including Adhering to the building codes of 2012, International Building Codes

Table D-3: 2012 Mitigation Measures for Pascua Yaqui Tribe

Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Lead Agency	Potential Funding Source(s)	Status • No Progress • In Progress • Complete	Disposition • Keep • Delete • Keep, revise	Explanation or brief description of work so far or reason for 'no progress'
Review existing building codes to determine adequate protection for new development in hazard areas. Where feasible and necessary, modify codes to help mitigate hazards imposed on such development within the limits of the Reservation, while also respecting private property rights adjacent to the Reservation.	Drought Earthquake Severe Wind	Staff	Ongoing and Continuous	*Land Development *Tribal Council	General Fund	In Progress	Delete	Drought no longer necessary. Tribal Land Department with BIA resources determined we did not have sustainable water. Earthquake no longer necessary. Overseen by AZGS. Serve wind, no longer necessary. Overseen by Tribal Building Inspections, addressed through adhering to the building codes.
Continued coordination between the Tribe, Pima County Departments, municipalities, Pima Association of Governments, and other agencies in the development and maintenance of accurate geographic information system information for those hazard areas identified in the adopted hazard mitigation plan.	All	Staff	Ongoing and Continuous	*Land Development *Tribal Council	General Fund	In Progress	Delete	

Table D-3: 2012 Mitigation Measures for Pascua Yaqui Tribe								
Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Lead Agency	Potential Funding Source(s)	Status • No Progress • In Progress • Complete	Disposition • Keep • Delete • Keep, revise	Explanation or brief description of work so far or reason for 'no progress'
Develop a Mass Evacuation strategy and formalize in a published document	All	Staff time	Continuing	*Fire & Police Departments *Land and Procurement Departments	General Fund	In Progress	Delete	

Table D-3: 2012 Mitigation Measures for Pascua Yaqui Tribe

Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Lead Agency	Potential Funding Source(s)	Status • No Progress • In Progress • Complete	Disposition • Keep • Delete • Keep, revise	Explanation or brief description of work so far or reason for 'no progress'
<p>Conduct and enhance environmental and epidemiological surveillance activities in those areas identified as being of high public health importance and related to environmental factors such as; food safety, protection, and vector control activities. Surveillance activities must include the identification of vulnerabilities and environmental factors that may contribute to the transmission of the communicable diseases associated with the operation and presence of these facilities in the Tribe, as well as the implementation of preventative action that may be applied to reduce or eliminate the potential for transmission of communicable illnesses. Develop and improve the system of coordination and communication of these findings, trends and observations with other federal, state and local agencies that have similar or related interest.</p>	Disease	N/A	Ongoing	*Epidemiology Center Director	General Fund	In Progress	Delete	No longer necessary; overseen by our Tribal PHEP/Injury Prevention Coordinator

Table D-4: 2012 Mitigation Measures for Sahuarita								
Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Lead Agency	Potential Funding Source(s)	Status <ul style="list-style-type: none"> • No Progress • In Progress • Complete 	Disposition <ul style="list-style-type: none"> • Keep • Delete • Keep, revise 	Explanation or brief description of work so far or reason for 'no progress'
Promote Child Drowning Prevention programs throughout the Town.	Drowning	\$3,000 and staff time	May 2012	Police Communications	Open		Delete	Not mitigation
Continued adherence to AAC R18-9 for reductions in pollutant discharge at Town Aquifer.	HazMat	\$15,000	March 2012	Public Works	Waste Water Fund		Delete	Covered under separate plan
Update Waste Water Department contingency and emergency plans	HazMat	Staff time	March 2012	Public Works	None		Delete	Covered under separate plan
Continue annual updating of Town Storm water/Flooding Pollution Prevention Plan	Flood	Staff Time	January 2013	Public Works	None	In Progress	Keep, revise	Ongoing program; AZPDES requirement
Continue use of permit process from Corp of Engineers to streamline maintenance and bank stabilization efforts when needed	Flood	Staff Time	Ongoing	Public Works	HURF Funds	In Progress	Delete	Ongoing task, not task specific

Table D-4: 2012 Mitigation Measures for Sahuarita								
Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Lead Agency	Potential Funding Source(s)	Status • No Progress • In Progress • Complete	Disposition • Keep • Delete • Keep, revise	Explanation or brief description of work so far or reason for 'no progress'
Organize and host annual Southern Arizona Beat Back Buffelgrass community removal event	Wildfire	Staff Time		Public Works	T.O. Nation Grant	In Progress	Keep, revise	Ongoing work through volunteer and staff efforts to remove/spray Buffelgrass; removal of noxious/invasive species through Sahuarita Town Code for Riparian Habitat Protection and Mitigation Requirements
Implement Vector Borne Illness prevention program through mosquito abatement	Disease (Pandemic)	\$10,000	September 2012	Public Works Parks and Rec	General Fund		Delete	Ongoing program, not task specific
Updating of riparian ordinance to protect various species that reduces erosion to mitigate flooding potentials and also reduces development in flood prone areas	Flood	\$300 and staff time	December 2011	Planning and Zoning	General Fund	Complete	Delete	Resolution 2013-0344 and Ordinance 2013-077 amending the Riparian Habitat Protection and Mitigation Requirements of Town Code were adopted on January 16, 2013

Table D-4: 2012 Mitigation Measures for Sahuarita								
Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Lead Agency	Potential Funding Source(s)	Status • No Progress • In Progress • Complete	Disposition • Keep • Delete • Keep, revise	Explanation or brief description of work so far or reason for 'no progress'
Continued Controlled Burns on Town Property	Wildfire	\$2,000 and staff time	January 2012	Fire Department Public Works	General Fund		Delete	Ongoing program based on Fire Department programming
Review, Update and Modify NFIP requirement and make appropriate modifications to Flood Plain Ordinance	Flood	Staff Time	January 2013	Public Works	None	In Progress	Keep, revise	Coordination with Arizona Department of Water Resources for ordinance update
Educate the public to increase awareness of hazards, and potential opportunities for mitigation actions. Make Pima County's public information material sheets, websites, mitigation brochures, and media outlets available.	All	Staff Time	July 2012	Emergency Management	None	Complete and Ongoing	Keep, revise	Resolution 2012-0303 adopting the Pima County Multi-Jurisdictional Hazard Mitigation Plan was approved on June 11, 2012. Posting of educational materials and links to Pima County's information on the Town Website is being explored.
Landscape code amendment requiring vegetation adjustment in developed areas to	Extreme Temperatures	\$300 and staff time	December 2011	Planning and Zoning	General Fund	Complete	Delete	Resolution 2011-0280 and Ordinance 2011-060 amending the Landscaping, Buffering and

Table D-4: 2012 Mitigation Measures for Sahuarita								
Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Lead Agency	Potential Funding Source(s)	Status • No Progress • In Progress • Complete	Disposition • Keep • Delete • Keep, revise	Explanation or brief description of work so far or reason for 'no progress'
reduce the heat island effect								Screening Standards of Town Code were adopted on October 24, 2011.
Develop and Implement internal emergency response procedure	All (Response)	Staff Time	May 2012	Public Works	None	Complete	Delete	Resolution 2012-0297 adopting the Town of Sahuarita Emergency Operations Plan was approved on May 29, 2012.
Improve upon existing capabilities to warn the public of emergencies by initiating a system to test the ability of local emergency managers to activate the AENS systems.	All (Response)	\$5,000	January 2013	Emergency Management	General Fund		Delete	Not mitigation
Develop and Implement an interoperable communications between all emergency-related departments	All (Response)	Staff Time	January 2013	Emergency Management, Local Fire District	None		Delete	Not mitigation
Implement Development Criteria for the Lee Moore	Flood	Staff Time	Ongoing	Public Works,	None		Delete	Resolution 2010-237 adopting the Lee Moore Wash Basin

Table D-4: 2012 Mitigation Measures for Sahuarita								
Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Lead Agency	Potential Funding Source(s)	Status <ul style="list-style-type: none"> • No Progress • In Progress • Complete 	Disposition <ul style="list-style-type: none"> • Keep • Delete • Keep, revise 	Explanation or brief description of work so far or reason for 'no progress'
Wash Basin Management Plan				Planning and Zoning				Management Study was adopted on December 13, 2010. Ongoing work includes implementation of the development criteria.

Table D-5: 2012 Mitigation Measures for Tucson

Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Lead Agency	Potential Funding Source(s)	Status • No Progress • In Progress • Complete	Disposition • Keep • Delete • Keep, revise	Explanation or brief description of work so far or reason for 'no progress'
Identify funding source and construct two bridges and 50 box culverts with 380 back-up power units for signalized intersections at high flood hazard crossings in Tucson limits in accord with the COT Department of Transportation 5-yr plan. If a box culvert cannot be constructed an automated warning device, consisting of a barricade, signs and flashing lights would be installed.	Flood, Severe Wind	\$100 million, Staff Time	Ongoing effort with long-term horizon. Schedule dependent upon funding	Department of Transportation Streets Administrator and Streets Chief Engineer	Grant Funds	No Progress	Keep	No funding
Tucson Water, a division of the Utility Services Department will secure its assets and facilities by implementing actions, in phases, as identified in the Federally mandated Water System Vulnerability Assessment completed in Oct 2002.	Terrorism, Vandalism	\$20 million	On-going with full completion by 2020	Water Department / Water Engineer & Operations	Operations Budget	N/A	Delete	Not a natural hazard

Table D-5: 2012 Mitigation Measures for Tucson

Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Lead Agency	Potential Funding Source(s)	Status • No Progress • In Progress • Complete	Disposition • Keep • Delete • Keep, revise	Explanation or brief description of work so far or reason for 'no progress'
Promote disaster-resistant water delivery system by constructing redundant water transmission lines (e.g., The Utility and the community will be less susceptible to loss of water delivery due to natural or human-caused disasters).	All	\$7.9 million	On-going with full completion by 2020	Water Department / Water Administrator Maintenance & Operations	Operations Budget	In progress	Keep, revise	Work has been ongoing in constructing redundancy in to the system. Project will be revised to include new project goals and increase estimated cost.
Work with the AZGS and USGS on projects that mitigate geo-hazards (e.g. continue the feasibility study with the AZGS and USGS Water Plan 2000-2050.	Drought, Earthquake, Subsidence, other geo-hazards.	\$51.2 million	Ongoing effort with long-term horizon. Schedule dependent upon funding	Water Department / Staff	Operations Budget	Complete	Delete	Work on mitigating subsidence was done with the USGS. Subsidence issues were monitored in concert with USGS.
Construct second recharge facility to be known as the Southern Avra Valley Recharge and Recovery Project (SAVSARP). The utility could then use its entire allotment of Central AZ Project water and provide capacity for recharging additional water supplies. Construction will take 5 years).	Drought, Earthquake, Subsidence, other geo-hazards.	\$51.2 million	2016	Water Department/Staff	Operations Budget	Complete	Delete	Completed ahead of schedule, total investment of \$45 million.

Table D-5: 2012 Mitigation Measures for Tucson								
Description	Hazard(s) Mitigated	Estimated Cost	Anticipated Completion Date	Lead Agency	Potential Funding Source(s)	Status • No Progress • In Progress • Complete	Disposition • Keep • Delete • Keep, revise	Explanation or brief description of work so far or reason for 'no progress'
Re-direct drainage canal at Barrio Viego to prevent continued repetitive losses.	Flood	\$425,000	2013	Transportation Department / Project Administrator	Grant Funds, General Fund, PCRFC	No progress	Keep	No funding
In compliance with the NFIP, Tucson will continue to require the preparation and submittal of a CLOMR or CLOMR-F for all proposed development within FEMA delineated Special Flood Hazard Areas	Flood	Staff Time	Annual Ongoing	Development and Planning Services Department / Director	Department Budget and Fees for Developers	In Progress	Keep	Ongoing annually
Tucson will maintain compliance with NFIP regulations by enforcement of the current floodplain management ordinance through review of new development located in the floodplain and issuance of floodplain use permits.	Flood	Staff Time	Annual Ongoing	Development and Planning Services Department / Director	Department Budget	In Progress	Keep	Ongoing annually
Improve floodplain administration under the NFIP program by sending inspectors into the field when we receive a flood warning from the NWS, to assess bridges, washes and other critical infrastructures within Tucson.	Flood	Staff Time	Annual-Ongoing	Development and Planning Services Department / Director	Department Budget and Information	In Progress	Keep	Ongoing annually