CHAPTER VI

Mitigation Strategy

The hazard mitigation strategy is the culmination of work presented in the planning area profile, risk assessment and capability assessment. It is also the result of multiple meetings and public outreach. The work of the Hazard Mitigation Council was essential in creating the following mitigation goal, objectives and individual mitigation actions.

Multi-Hazard Mitigation Goals and Objectives

The Goal of the 2015 American Samoa Hazard Mitigation Plan, endorsed by the Territorial Hazard Mitigation Council, is to:

Reduce the risk of all natural hazards (identified and unidentified) to the Territory, thus alleviating loss of life and property to insure the well being of the people of American Samoa.

The Objectives of the Plan are to:

1. Promote effective land use planning and regulation, as well as public awareness, in order to reduce damage from natural hazards.

2. Improve infrastructure development standards with special attention to mitigating the increasing flood hazard.

3. Develop and implement hazard mitigation projects aimed at reducing the risk of damage and destruction of existing assets and infrastructure from the full range of natural disasters threatening the Territory.

4. Improve building codes and standards, as well as training programs, in order to reduce disaster damage from strong winds, earthquakes and tsunamis.

5. Develop public information and education programs in order to reduce disaster damage from strong winds, earthquakes and tsunamis.

6. Fund related planning projects to strengthen mitigation standards, research, education, and outreach efforts.

Review of Goal Validity

The Hazard Mitigation Council reviewed the validity of the Goal and the Objectives several times during the planning process. They voted to keep the goal and objectives identical to the one's used in 2011 at their July 11, 2014 meeting. Many of the mitigation actions in the plan address chronic and repetitive flooding, power loss, communication issues and transportation problems each of which hinders productivity and livelihoods in the Territory of American Samoa. These problems are exacerbated during repetitive hurricanes and other disasters.

American Samoa has a long history of hazard mitigation going back to pre-European contact times. Samoan houses or fales were designed and constructed to reduce risk of destruction from strong winds and earthquakes—roof framing was lashed together and thatch sheets were sewn on with coconut sennit. During strong windstorms, roofs could be lifted off of house posts and set on the ground to provide shelters. Structures were flexible and could tolerate earthquakes. House platforms were often elevated which made them less subject to flood damage.

In recent years, building codes and standards, land use regulations, and flood mitigation requirements have been developed to reduce the risk of disaster damage. Building codes aim at reducing the impacts of strong winds and earthquakes. Land use regulations restrict construction and development in areas subject to flooding, tsunami, storm surge, high surf, and landsides. Droughts are mitigated through water conservation programs, agricultural practices, and infrastructure repair. Environmental policies that protect the island ecosystems provide additional protection from storms and flooding. American Samoa is still vulnerable to losses from natural hazards. Mitigation strategies are summarized for each category of natural hazard.

Types of Hazard Mitigation Actions

FEMA characterizes mitigation actions into four categories, Local Plans and Regulations, Structure and Infrastructure Projects, Natural Systems Protection and Education and Awareness Programs. The planning team made the Hazard Mitigation Council aware of these categories as a way to help identify possible mitigation actions. The Planning Team emphasized that Education and Awareness Programs are frequently the least expensive of the four categories but may provide a significant return on investment. The following table, taken from the Local Mitigation Planning Handbook, clearly defines each of these mitigation types and provides examples.

Mitigation Action Category	Description of Category	Examples of Mitigation Actions
1 Local Plans and Regulations	These actions include government authorities, policies, or codes that influence the way land and buildings are developed and built.	• Comprehensive plans • Land use ordinances • Building codes and enforcement • Capital improvement programs • Open space preservation • Stormwater management regulations and master plans
2 Structure and Infrastructure Projects	These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.	• Acquisitions and elevations of structures in flood prone areas • Utility undergrounding • Structural retrofits. • Floodwalls and retaining walls • Detention and retention structures • Culverts • Safe rooms
3 Natural Systems Protection	These are actions that minimize damage and losses and also preserve or restore the functions of natural systems.	• Sediment and erosion control • Stream corridor restoration • Forest management • Conservation easements
4 Education and Awareness Programs	These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. A greater understanding and awareness of hazards and risk among local officials, stakeholders, and the public is more likely to lead to direct actions.	• Radio or television spots • Websites with maps and information • Real estate disclosure • Mailings to residents in hazard-prone areas. • StormReady • Firewise Communities

Table 1 Four Mitigation Action Categories[1]

1 Local Mitigation Planning Handbook. (2013). U.S. Dept. of Homeland Security, FEMA. P. 6-4.

Mitigation Strategies Specific to Each Hazard

Table 2 Hazard Mitigation Strategies below represents general mitigation strategies for the natural hazards known in American Samoa.

Table 2 2011 Mitigation Project List

Hazard	Major Concerns	Mitigation Strategies
Climate Change	Sea-level rise and coastal erosion as a result of more frequent and more severe periods of drought and flooding; According to the United Nations Confronting Climate Change report, the significant impacts of climate change to the pacific islands and small island nations is: "inundation of low-lying coral islands as sea level rises; salinization of aquifers; widespread coral bleaching; more powerful typhoons and possible intensification of ENSC extremes." [2]	• Enforcement of the shoreline setback rules of the Coastal Zone Management Act through better risk maps and improved PRNS permitting and inspections; • Education programs to increase awareness and mitigation of impacts of climate change on island environments; • Local monitoring and hazard mapping program; • Continue to implement and expand actions in Executive Order (EO) 0101A-2007, which focuses on reducing climate change impacts.
Coastal Erosion	Loss of beach area and loss of properties near the beach; Erosion acceleration through human activities; Loss of buildable area – limited buildable, flat area on island of which most resides near the coast (making it important to protect for current and future population).	Many coastal erosion remedies have negative consequences and must be studied in detail to determine if they are the best solution. • Submerged breakwaters (decreases wave velocity); • Detached breakwaters (artificial islands offshore); • Beach nourishment programs; Increased local monitoring and data collection to determine areas in greatest need of protection; • Update of USACE shoreline status data and mapping (last updated in 2004); • Continued installation of wave dampening structures (such as Samoa Stone) where appropriate; • Identification of at-risk structure through on-island studies.

2 Confronting Climate Change (2007). Retrieved September 30, 2014 from carboncounted.com.

Hazard	Major Concerns	Mitigation Strategies
Drought	Droughts have historically been related to El Niño-Southern Oscillation (ENSO) events, but managed fairly effectively. A short period without rain may quickly deplete available potable water and harm agriculture and livestock. A major, long-term drought has potential to cripple cannery industry which could have a ripple effect through the economy.	• ASPA Water Resource Management, Agricultural Extension Programs for Farmers; • Wildfire Suppression; • Implement water conservation programs and water restrictions if a drought is predicted to be of significant duration; • Improve the water supply system and storage system; • Continue to eliminate known leaks and damage to the storage containers and distribution lines; • Implement agriculture programs through extension agents to help farmers; • Provide early warning information and forecasts to improve decision making about planting and harvesting, as well as livestock management prior to the onset of drought; • Develop a drought management plan in conjunction with local industry to help address water usage and ability to secure fresh water as needed; • Increase public awareness and education about the risks from drought and preventative measures individuals and businesses can adopt to conserve water.

Hazard	Major Concerns	Mitigation Strategies
Earthquake	Frequent but minor damage historically. Risk not fully understood. Buildings not designed to withstand strong shaking events.	• Design new buildings and infrastructure to minimize levels of seismic risk as determined from historic levels of earthquake activity; • Adopt and enforce a building code to reflect latest building technologies; • Define areas of landfill via a Territorial-wide survey. Earthquake shaking of structures is amplified on unconsolidated sandy soils and areas of known landfill. To understand and define the areas of highest earthquake hazard, complete a study to define known landfill areas in American Samoa; • Request the U. S. Geological Survey (USGS) to conduct a comprehensive Seismic Hazards Probability Analysis. These analyses have been completed throughout the United States. A similar analysis is required to understand the earthquake threat to American Samoa from both local and distant earthquake sources in the South Pacific. This information is required to adequately determine seismic building code requirements for American Samoa; • Request that USGS develop earthquake shake maps for the Territory to assist with planning; • Determine areas of liquefaction vulnerability; • Further investigate critical facilities at risk to determine if mitigation projects or relocation would be cost effective; • Institute a Seismic Monitoring Program for American Samoa. Currently, American Samoa does not have any seismic recording instruments to record ground motions from earthquakes. Deploy an adequate network of seismic recording instruments on Tutuila and the Manua Islands in order to understand the nature of local earthquake fault activity; • Increase public awareness and education about the risks from earthquakes and tsunamis.
Flood	Most chronic hazard—threat to roads, homes, businesses, and critical facilities.	Improvements in Land Use and Flood Plain Management and Regulation; Relocation of Existing Structures; Elevation of Existing Structures; Structural and Non-structural Flood Mitigation Projects.

Hazard	Major Concerns	Mitigation Strategies
Hazardous Materials	Abandoned toxic chemicals without proper storage affecting the environment and populations. Unknown locations and amounts of illegally imported hazardous materials	• Formalize a partnership with U.S. EPA and A.S. EPA for hazard materials subject matter experts and management assistance; • Recognize the dangers posed by hazardous materials; • Identify places where hazardous materials are likely to be encountered; • Understand when a hazard may exist; • Contact the appropriate persons or agencies to give or receive specific hazardous materials information; • Hold an "ask no questions" drive for people to bring hazardous materials to a location for proper disposal by A.S. EPA; • Identify procedures to minimize personal and community exposure to hazardous materials; • Identify and map facilities with hazard materials; • Consider relocating the tank farm.
High Surf	Debris washes onto roads near the coast and can washout parts of the road.	• Construction of barrier to prevent debris from washing onto roadways; • Construction of structures to ease wave impacts and prevent road washout; • Purchase of additional equipment to aid in swift sand and road removal; • Development of a traffic management plan or protocol when roads are blocked by debris; • Map areas subject to frequent over wash; • Public education to emphasize the danger of high tide for swimmers and fishermen.

Hazard	Major Concerns	Mitigation Strategies
Landslides	Serious threat to villages and roads. Limited land use regulation can result in high-risk development.	Improvements in Land Use Management and Regulation (including new building permit approval); • Relocation of Existing Structures; • Village Mitigation Ordinances; • Mitigation of repetitive rock fall hazards to populations; • Consider the landslide hazard map zones for land use decisions, where applicable; • Enforce building setbacks through Permit Notification and Review System for slopes less than 40% grade and no building on slopes 40% or greater; • Build on the least risky areas of the land parcel or leave a buffer between the building and a steep slope (above or below) the property; • Relocate or condemn structures that are at high risk; • Establish village mitigation ordinances that limit use of high-risk areas while allowing villagers to develop alternative parcels of land; • Leave local vegetation in place and replant areas that are barren from development or fire, for example; • Enact regulations to require non-eroding drainage for new development; • Increase public awareness and education about the risks from landslides including when and where occurrence is most likely; • Further investigate critical facilities at risk to determine if mitigation projects or relocation would be cost effective; • Track and map all occurrences and include relevant information such as location, type, size and cause; • For slopes in agricultural areas, prevent grading and clearance. Cultivate and reforest with deeply rooting plants to prevent erosion on slopes.
Lightning Strike	Infrequent hazard that has caused deaths and injury in the past. Limited occurrence may hinder public knowledge	• Public Awareness and Education to ensure the population understand how to react to the hazard; • Install lightning protection devices on critical communication facilities; • Install surge protection where critical; • Track all occurrences locally to determine if there is a season where risk is elevated and if it causes additional issues (such as fire or electrical damage).

Hazard	Major Concerns	Mitigation Strategies
Soil Hazards (Including expansion, subsidence and sinkholes)	Limited knowledge of this hazard locally (presumed to be low given soil composition); some history of subsidence.	• Further assess risk to these hazard to technical studies; • Enact a local monitoring program to monitor severity.
Tropical Cyclones (including storm surge) and High Wind Storms	Most serious threat in terms of economic impact and widespread damage to buildings and utilities. Buildings not designed to withstand high winds	• Harden existing facilities and utilities. For example, install hurricane clips, provide shutters for windows, and anchor roofs; • Harden or strengthen infrastructure with anchor utility poles, use steel or concrete poles, install underground wires and cables, harden bridges, and identify bypass roads; • Increase public education and awareness, motivating people to prepare their homes and communities against disasters; • Consider land use zoning to minimize development in areas of known potential high waves, storm surge, and coastal erosion; • Consider new flooding design standards in the International Building Code (or ASCE 24) to minimize risk in identified and/or mapped zones of high waves, storm surge, and coastal erosion; • Increase public awareness and education about the risks from high waves, storm surge, and coastal erosion; • Locate development away from the shoreline; • Harden bridges and roads and allow proper drainage; • Relocate facilities and houses out of the designated VE zones or away from eroding shorelines; • Public education to anchor loose outdoor items and properly store hazardous chemicals.

Hazard	Major Concerns	Mitigation Strategies
Tsunami	Infrequent occurrence but potentially life threatening. Serious threats to coastal roads and beaches due to increased wave action and storm surge.	• Continued mapping and study of potential events and impacts locally; • Assess risk to fires following tsunami; construct tsunami shelters; • Land use zoning to minimize development in areas of known potential tsunami inundation. This is one of the best mitigation strategies but it is not very practical in American Samoa. The people of American Samoa own their land; • Shoreline Setbacks; • Floodplain Management Enforcement (and participation in NFIP); • Consider new flooding design standards in the International Building Code (or ASCE 24) to minimize risk in tsunami zones; • Review safe zones to ensure safety from flooding and other hazards; • Update hazard mapping to reflect potential risk areas; • Assess risk to fires following tsunami; • Construct tsunami shelters; • Relocate/harden critical facilities; • Develop scenarios to investigate future risk to tsunamis; • Increase public awareness and education about the risks from tsunami; • Continue to conduct island evacuation drills.
Volcano	Risk from neighboring island eruptions that may bring secondary volcano impacts such as vog, decreased air quality impacts, marine life die off; commerce impacts	• Install air quality monitoring station to monitoring air following a nearby event; • Assess worst case scenarios from nearby eruptions to determine potential extent of secondary impacts; • Update hazard mapping for impact areas; • Public education and awareness of volcanic eruptions and impact on island.
Wildfires	Infrequent occurrence but possible due to drought, earthquake or hazardous material incidents.	Implement Firewise Communities program; • Enact regulations regarding open space and open fires; • Maintenance programs for dead or dry underbrush(fuel); • Identification and mapping of high-risk areas; • Continued Public education on burning and associated risks.

Flood Mitigation Strategies

The American Samoa Flood Mitigation Plan written in 2003 is now defunct. The Hazard Mitigation Council recommends that American Samoa consider promoting participation in the National Flood Insurance Program (NFIP) and consider participation in the Community Rating System (CRS) to decrease cost to individuals participating in the NFIP. See Appendix N for 2003 Flood Mitigation Plan Recommendations

Prior to considering a new list of mitigation projects, the Hazard Mitigation Council and the Planning Team took a good look at the current list of projects. Table 3 2011 Mitigation Project List below includes a 2014 Status column. Several projects received funding and several need to remain on the list for future consideration.

Table 3 2011 Mitigation Project List

Project Priority #	Project Title	Agency	Objectives	2014 Status
1	Satala Power Plant Retaining Wall	ASPA	Retaining wall to protect new power plant renovations and preserve island accessibility.	Funded - Remove
2	Vaipito Stream Revetment	DPR	Mitigate stream runoff and ponds toward residential and commercial settlement.	Keep on list
3	Leone to Amanave Underground (U/G) Lines	ASPA	Underground (u/g) power lines, improve overhead lines to non-church and water well locations.	Keep on list
4	Airport to Malaeimi U/G Lines	ASTCA	Convert aerial cables into u/g conduits and protect against high wind speeds.	Remove
5	Maintenance and Operation Building Enhancement	DPW	Upgrade structure for reliability in emergency response.	Keep on list - #8 on DPW priority list
6	Afono Culvert Improvement	DPW	Mitigate stream runoff and ponds toward residential and commercial settlement.	Keep on list
7	Nuuuli to Mesepa U/G Lines	ASPA	U/g power lines, improve overhead lines to non-church and water well locations.	Keep on list
8	Mesepa to Futiga U/G Lines	ASTCA	Convert aerial cables into u/g conduits and protect against high wind speeds.	Remove
9	Poloa to Fagamalo U/G Lines	ASPA	U/g power lines, improve overhead lines to non-church and water well locations.	Keep on list
10	Pavaiai to Aoloau U/G Lines	ASTCA	U/g power lines, improve overhead lines to non-church and water well locations.	Remove

Project Priority #	Project Title	Agency	Objectives	2014 Status
11	Fagaima Road Flood Mitigation	DPW	Mitigate stream runoff and ponds toward residential and commercial settlement.	Keep on list
12	Ottoville Drainage Flood Mitigation	DPW	Mitigate stream runoff and ponds toward residential and commercial settlement	Keep on list
13	Ottoville to Malaeimi U/G Lines	ASPA	U/g power lines, maintain power supply to wells and booster station.	Funded - Remove
14	Faga'alu Shoreline Wave Action Mitigation	DPR	Protect and preserve shoreline from further erosion.	Remove
15	Evacuation and Fagatogo Wave Action Mitigation	DOC	Prevent riverbank erosion from entering raw water reservoir and overflowing damages into the MFP Building.	Remove
16	Permanent Landslide Repair Route 11	DPW	Slope stabilization to resist movement of loose material. Install/construct drainage improvement.	Keep on list
17	Permanent Landslide Repair Route 005	DPW	Slope stabilization to resist movement of loose material. Install/construct drainage improvement.	Keep on list
18	Pago Pago-West Wave Action Mitigation	DPR	Protect and preserve shoreline from further erosion.	Remove
19	Fatuoaiga Drainage Flood Mitigation	DPW	Mitigate stream runoff and ponds toward residential and commercial settlement.	Keep on list
20	Ili'ili Drainage Flood Mitigation	DPW	Mitigate stream runoff and ponds toward residential and commercial settlement.	Keep on list
21	Utulei Shoreline Wave Action Mitigation	DPR	Protect and preserve shoreline from further erosion.	Keep on list
22	Fagatogo Reservoir Mitigation	ASPA	Prevent riverbank erosion from entering raw water reservoir and overflowing damages into the MFP Building.	Keep on list
23	Utumoa River Flood Mitigation	ASPA	Protect from further erosion from mudslides, landslides and high floodwaters.	Keep on list

Project Priority #	Project Title	Agency	Objectives	2014 Status
24	High Court and District Court Building Relocation	HC	Relocation of the high and district court to safer grounds to avoid future damages caused by flooding or storm surge.	Keep on list – project changed to elevation instead of removal
25	Tago Stream Flood Mitigation	DPW	Mitigate stream runoff and ponds toward residential and commercial settlement.	Keep on list
26	ASG-DOE Facilities Electrical Upgrade	DOE	Due to soil erosion through the years, electrical wires are exposed to natural elements and become a liability to the students as well as a fire hazard. Electrical wires installed in the late 1960's were buried in a trench without proper conduits.	Keep on list – now DPW is responsible
27	Office of Public Information Building	OPI	Building is a hazard within itself and has been condemned by DPW. Structure needs to demolished and reconstructed.	Keep on list – now DPW is responsible. See Appendix D: Mitigation Success Stories and Updates for article "Rehab or condemn – that is the question."
28	Generator Sets	ASTCA	Generators to ensure communication lines remain in tact during disaster.	Keep on list
29	Fagaitua High School Drainage Mitigation	DOE	Protect structure and contents from further flooding that is constantly plaguing the classrooms as well as having to relocate student classrooms.	Funded - Remove
30	Tualauta Drainage	DPW	Line stream channel, check structures for velocity reduction and debris/ sediment reduction.	Funded – Remove, awaiting BCA
31	Futiga U/G Lines	ASTCA	Underground and communication lines, copper and fiber optics.	Funded – Remove work is complete
32	Tafuna Power Plant Walls	ASPA	Harden plant walls; install ventilation ducting to help weatherproof generation equipment.	Funded – Remove, work is pending

Project Priority #	Project Title	Agency	Objectives	2014 Status
33	Rockfall Mitigation	DPW	Scale unstable/loose rocks. Install earthen berms, fences, and signs to warn traffic.	Funded – Remove, work is pending
34	Leone U/G Mitigation	ASTCA	Underground communication lines, copper, and fiber optics.	Funded – Remove work is complete
35	Terminal Roofing	DPA	Remove the airport terminal wooden shakes roofing and replace with ultra-trim deck roofing. Include gutters and improved gutter run off drainage.	Funded – Remove work is complete
36	Malaeimi U/G Mitigation	ASPA	U/g main power lines, related pad mount transformers and fiber boxes, concrete vaults, u/g switches, underground service lines to identified facilities.	Funded – Remove, work is pending
37	Matuu Stream	DPW	Mitigate stream runoff and ponds toward residential and commercial settlement.	Funded – Remove, work is in progress
38	Building Code Upgrade	ASDRO	Upgrade building code of 2006 IBC.	Funded – Remove, work is in progress

2011 Mitigation Projects Funded

The following projects from the 2011 Hazard Mitigation Plan have been funded and removed from the master project list. Some of these projects are completed and some are funded but have not yet begun.

- Satala Power Plant
- Ottoville to Malaeimi Underground Power Lines
- Fagaitua High School Drainage Project
- Tualauta Drainage Project
- Futuga Underground Power Lines
- Tafuna Power Plant
- Rockfall Mitigation
- Leone Underground Power Lines
- Terminal Roofing at Airport
- Malaeimi Underground Power Lines
- Matu'u Stream
- Building Code Upgrade

Figure 1 Tafuna Flood Control Project Map

Tualauta Flood Control Project

EPA discussion on Tualauta Flood Control Project: Environmental Impacts

- EPA is 100% behind the Tualauta Flood Control project. EPA has a Boil Water Decree in place for first half of 2014 that continues: The "Entire Island is under Boil Water Decree". Tutuila cannot lift boil water decree until it either filters surface water runoff with a fine filter mesh, according to EPA standards. According to ASPA, 9 of the island's most productive water wells are impacted by the surface runoff in the Tualauta area.
- Additionally, the surface water runoff and sediment disposal into Pala Lagoon, downstream of the Taulauta area, creates a zone of toxic deterioration of lagoon waters with and environmentally detrimental impact.
- EPA supports a storm water management plan, for the Tutuila.
- EPA stated that 80% of water in the Tafuna Acquifer is impacted by surface water runoff due to presence of E. coli bacteria from surface runoff.
- EPA states that the existence of surface water has a very real environmental and economic impact causing secondary health care impacts, mosquitoes and currently an amebiasis outbreak. Amebiasis is a parasitic infection of the intestines caused by entamoeba histolytica. It is common in tropical areas of the world where sanitation is poor, allowing food and water supplies to be exposed to fecal contamination. There is also an incidence of E. coli where surface waters intersect piggeries, which introduce leptospirosis. A direct impact is the loss of school days due to sicknesses. Escherichia coli (E. coli) bacteria normally live in the intestines of healthy people and animals. Most varieties of E. coli are harmless or cause relatively brief diarrhea. But a few particularly nasty strains, such as E. coli O157:H7, can cause severe abdominal cramps, bloody diarrhea and vomiting.[3]

3 Diseases and Conditions E. coli. (2014). Mayo Clinic. Retrieved September 30, 2014 from http://www.mayoclinic.org/diseases-conditions/e-coli/basics/definition/con-20032105

- EPA reports that the USDA funds about 100 mitigated piggeries per year.
- Additional environmental risks include burying the reef in sediment from unmitigated and unretained runoff in the Tafuna Plain area.
- Persons attempt to pick up trash in Tualauta area to prevent it from entering into the Pala Lagoon embayment, which is anecdotally described as "a big brewing cesspool."
- EPA also recognizes the recreational values of Pala Lagoon are reduced by unmitigated surface runoff, resulting in people who swim getting sick.
- EPA also noted the economic value of being able to swim in the Lagoon waters. Without recreational swimming in American Samoa's main lagoon, their quality of life is lowered.

ASPA Tualauta Flood Control Comments and Discussion

- ASPA has commented and agrees that the Tualauta Flood Control Issue is a major issue for the ground water and water resources of the island. The water wells at Fagaima are flooded often by surface water runoff and contaminate the water wells through a process known as Groundwater Under the Direct Influence of surface water (GUDI). Currently, as of July 2014, the entire island is under Boil Water Notice by EPA and will remain so until the problem is eliminated through surface water and flood control in the vicinity of the water wells.
- At present, in order for ASPA to mitigate the Boil Water Decree, ASPA is required to either employ treatment and filtration of all surface runoff and/or drill and develop new wells to offset the tainted wells. Bottom line, the surface water treatment is very costly and the EPA requires treatment of surface water in order to lift the Boil Water Notice.
- ASPA has stated that the wells in the Tualauta area affected by surface runoff are some of the best producing wells, producing over 2000 gallons per minute. ASPA seeks to keep these wells by undertaking the Tualauta Flood Control project aimed to improve the drainage, mitigate the surface runoff, which in turn, protects the water wells.
- ASPA estimates that the cost of well replacement is $100,000 per well to drill only. Transmission lines to water tank are estimated to cost $2/gallon of water. Thus, the cost to replace the wells is $200,000 minimum for a water well. With nine (9) wells impacted by surface water, the additional cost ASPA may be facing is $1.8 million to mitigate the surface water contamination problem. The nine replacement wells will have to be drilled in another area, less prone to surface water runoff and most likely these replacement wells will be less productive than the existing impacted wells. In addition, water transmission costs will rise accordingly.

Mitigation Actions

This section describes specific mitigation projects prioritized by the Hazard Mitigation Council, as well as the project selection process and criteria. As discussed in Chapter 3: The Planning Process and Outreach Strategy, the Hazard Mitigation Council developed an applicable mitigation project identification and selection process. The purpose of the mitigation projects is to protect life and safety and insure the well being of the people of American Samoa through a rapid recovery from future disasters.

The project identification process has evolved since 2003 in American Samoa. The Hazard Mitigation Council is well aware of FEMA's Pre-Disaster Mitigation Grant Program (PDM) requirements and the Hazard Mitigation Grant Program criteria. The Hazard Mitigation Council has used the guidance which states that the national priority is to address repetitive flood loss properties. It states that the following are eligible projects:

- Acquisition or relocation of hazard-prone property for conversion to open space in perpetuity.
- Structural and non-structural retrofitting of existing buildings and facilities, including designs and

feasibility studies when included as part of the construction project, for wildfire, seismic, wind or flood hazards (e.g., elevation, flood-proofing, storm shutters, and hurricane clips).

- Minor structural hazard control or protection projects that may include vegetation management, storm water management (e.g., culverts, floodgates, retention basins), or shoreline/landslide stabilization.
- Localized flood control projects, such as certain ring levees and floodwall systems that are designed specifically to protect critical facilities and that do not constitute a section of a larger flood control system.

Table 4 shows the fifteen projects from the 2011 Mitigation Plan that are still relevant and have been carried forward to this plan.

Table 4 Hazard Mitigation Projects from the 2011 Plan

#	Agency	Title	Est. Proj. Cost	POC
1	ASPA	Nuuuli to Mesepa U/G Power Lines	$1,377,647.00	Will Spitzenburg
2	ASPA	Poloa to Fagamalo U/G Power Lines	$970,523.75	Will Spitzenburg
3	ASPA	Fagatogo Reservoir Mitigation	$300,000.00	Will Spitzenburg
4	ASPA	Utumoa River Flood Mitigation	$257,500.00	Will Spitzenburg
5	DPR	Vaipito Stream Revetment	$448,000.00	Leilani Ripley
6	DPW	Afono Culvert Improvement	$250,000.00	Faleosina Voigt
7	DPW	Fagaima Road Flood Mitigation	$4,500,000.00	Faleosina Voigt
8	DPW	Ottoville Drainage Flood Mitigation	$683,000.00	Faleosina Voigt
9	DPW	Permanent Landslide Repair Route 11 (Masausi, Sailele)	$350,000.00	Faleosina Voigt
10	DPW	Permanent Landslide Repair Route 005 (Fagasa)	$520,000.00	Faleosina Voigt
11	DPW	Fatuaiga Drainage Flood Mitigation		Faleosina Voigt
12	DPW	Ili'ili Drainage Flood Mitigation	$1,310,000.00	Faleosina Voigt
13	DPW	Vaitele Stream Flood Mitigation (name correction passed by Council)	$500,000.00	Faleosina Voigt
14	HC	High Court and District Court Building Elevation (Council approved change to elevation from relocation.)	$2,750,000.00	Sandy Ilaoa
15	OPI	Office of Public Information Building	$4,500,000.00	Jeff Alwin

The following list of 26 mitigation projects was proposed to the 2015 Hazard Mitigation Council. These projects are new to the Hazard Mitigation Council, they were considered along with projects remaining from the 2011 project list. There are a total of 36 projects for this plan. Each project has a Project Worksheet completed by the submitting department. The Project Worksheets are included below in the order they are listed in Table 5 New Hazard Mitigation Projects Proposed in 2014. PowerPoint presentations given at the July 11, 2014 Hazard Mitigation Council meeting, if available, are included in the Appendix E.

The Hazard Mitigation Council put out a Call for Projects several times via press release to the Samoa News and at the Town Hall Meeting on April 25, 2014. The announcement ran in the Samoa News from May 7-9, 2014, and May 12-14, 2014. Copies of the announcement are in Appendix C: Planning Process Supporting Materials.

Table 5 New Hazard Mitigation Projects Proposed in 2014

#	Agency	Title	Est. Proj. Cost	POC
1	ASPA	Faga'alu Booster Station	$200,000.00	Will Spitzenburg
2	ASPA	Pago Water Booster Station Mitigation	$200,000.00	Will Spitzenburg
3	ASPA	Weather Proof Sewage Lift Stations	$300,000.00	Steve Branz
4	ASPA	Tafuna Wastewater Treatment Plant	$450,000.00	Steve Branz
5	ASPA	Water Wells Mitigation	$1,000,000.00	Will Spitzenburg
6	ASPA	Water Tanks Mitigation	$10,000,000.00	Will Spitzenburg
7	ASTCA	Afono Pass to Blue Sky Tower U/G Communications Lines	$916,546.40	James Taylor
8	ASTCA	Amouli to Aoa U/G Communications Lines	$1,208,042.00	James Taylor
9	ASTCA	Fagaitua,Masefau,Masausi,Sailele U/G Comm. Lines	$2,149,563.68	James Taylor
10	ASTCA	Leone to Poloa U/G Communications Lines[4]	$3,270,350.60	James Taylor
11	ASTCA	Aunu'u Tower Replacement Parts	$44,127.00	James Taylor
12	ASTCA	Lauli'I/Breaker's Point Tower Replacement Parts	$44,127.00	James Taylor
13	ASTCA	Manu'a Islands U/G Comm. Lines	$6,842,532.00	James Taylor
14	DHS	Wind Shutters EOC Project	$43,496.00	Alefa Afalava
15	DOC	Mapping Project	$50,000.00	Sandra Lutu
16	DPW	#1 Rockfall: Rte.009 (Utumea, Poloa, Amanave)	$2,400,000.00	Faleosina Voigt
17	DPW	#3 Amouli Stream Mitigation Project Ofu, Manu'a	$300,000.00	Faleosina Voigt
18	DPW	#2 Landslide: Rte.6 (Afono,Masefau), Rte.1 (Matuu,Gataivai)	$4,000,000.00	Faleosina Voigt
19	DPW	#4 Leone Village Road	$2,200,000.00	Faleosina Voigt
20	DPW	#5 Happy Valley Road Drainage	$220,000.00	Faleosina Voigt
21	DPW	#6 Pava'ia'I Elementary	$310,000.00	Don McMullin
22	DPW	#7 Electrical Upgrades Campus Grounds Drainage 10 Schools	$85,000.00	Faleosina Voigt
23	DPW	#8 Upgrading of DPW-M&O Building	$10,000,000.00	Faleosina Voigt
24	EPA	Landslide Early Warning System - Faga'alu Pilot Project	$278,000.00	Timothy Bodell
25	Port	Fuel Farm Relocation	$5,500,000.00	Chris Soti
26	Port	Runway Shoreline Protection	$5,000,000.00	Chris Soti

4 Sagapolutele, Fili. (2014). "BLAST project passes federal audit "with flying colors" according to CEO". Samoa News: 06-30-2014. Retrieved September 30, 2014 from http://www.samoanews.com/content/en/blast-project-passes-federal-audit-flying-colors-according-ceo

Ameriacn Samoa Power Authority

Water Wells Mitigation	
Project Description:	Install reinforcements for water wells and install weatherproof enclosures to withstand strong winds and the elements.
Project Objectives:	To weatherize/reinforce over 50 water well structures to withstand strong winds during hurricanes and earth movement during earthquake for the continued ability of ASPA to provide adequate water supply to its customers and community of American Samoa.
Estimated Cost:	$1,000,000.00
Project Duration:	5 years

Water Tanks Mitigation	
Project Description:	Install reinforcements for water tanks and install berms and retaining walls so that the water tanks can continue to operate after an earthquake or hurricane.
Project Objectives:	To weatherize/reinforce water tank structures to withstand strong winds during hurricanes and earth movement during earthquakes for the continued ability of ASPA to provide adequate water supply and pressure to the canneries and eastern village customers.
Estimated Cost:	$1,000,000.00
Project Duration:	5 years

Figure 2 Slide from ASPA PowerPoint Presentation

Fagatogo Reservoir Mitigation	
Project Description:	Slope stabilization and the construction of a 10' x 120' reinforced concrete retaining wall on the periphery of the Fagatogo reservoir. Construction of a reinforced concrete retaining wall along the bank of the stream in order to prevent erosion due to high stream flow and stop the river from overflowing into the Microfiltration building and damaging the equipment.
Project Objectives:	• Prevent rocks, soil and other debris from being deposited into the raw water reservoir. • Protect river bank from eroding due to high stream flow and stop the river from overflowing into the MFP building and damaging equipment.
Estimated Cost:	$300,000.00
Project Duration:	18 months

Tafuna Wastewater Treatment Plant	
Project Description:	Install reinforcements for critical columns and structures and install berms and retaining walls so that the wastewater treatment plant can continue to operate after a tsunami.
Project Objectives:	To weatherize/reinforce wastewater treatment plant structures to withstand tsunami for the continued ability of ASPA to treat wastewater
Estimated Cost:	$450,000.00
Project Duration:	24 months

Faga'alu Booster Station	
Project Description:	Install reinforcements for critical columns and structures and install berms and retaining walls so that the booster station can continue to operate after a tsunami.
Project Objectives:	To weatherize/reinforce booster station structures to withstand tsunami for continued ability of ASPA to provide adequate water supply and pressure to the canneries and eastern village customers.
Estimated Cost:	$200,000.00
Project Duration:	24 months

Pago Water Booster Station Mitigation	
Project Description:	Install reinforcements for critical columns and structures and install berms and retaining walls so that the booster station can continue to operate after a tsunami.
Project Objectives:	To weatherize/reinforce booster station structures to withstand tsunami for continued ability of ASPA to provide adequate water supply and pressure to the canneries.
Estimated Cost:	$200,000.00
Project Duration:	24 months

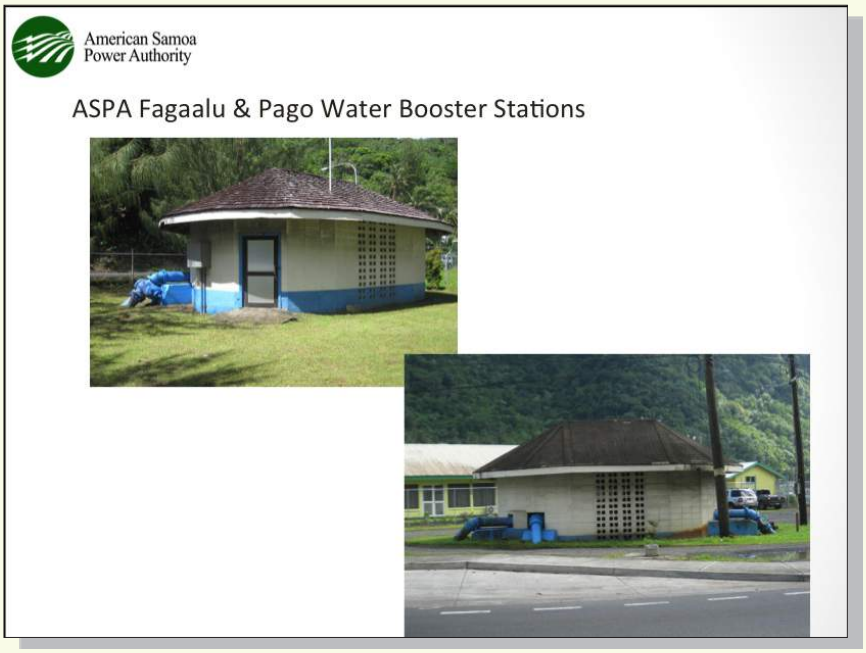


Figure 3 Slide from ASPA PowerPoint Presentation to Hazard Mitigation Council

Utumoa River Flood Mitigation	
Project Description:	Design and construction of rock wall to stabilize riverbank and reinforced concrete spring intake structure from boulders and mud due to landslide.
Project Objectives:	• Protect reinforced concrete spring intake structure from bounders and mud due to landslide and high floodwaters. • Prevent damage to the raw water screen house from erosion of the riverbank during high flow.
Estimated Cost:	$257,500.00
Project Duration:	4 months

Weather Proof Sewage Lift Stations	
Project Description:	Install and raise computerized controls above ground level and install in weatherproof panels rated to weather tsunami.
Project Objectives:	To weatherize computer controls to preclude critical electrical component loss during tsunami.
Estimated Cost:	$300,000.00
Project Duration:	24 months

Nuuuli to Masepa U/G Lines	
Project Description:	Total length of underground is about 1.4 miles. Undergrounding the main primary lines, terminating wires in padmount fiber boxes , padmount transformers and 13 concrete vaults. Padmount switches will also be installed because Feeder 6 can also feed power to the Tafuna well field by closing a parallel switch in Malaeimi. This will all be converted to underground switches. Four 2.5" conduits will be installed for underground wire placement and two spare 2" conduits will be included for future use to install a fiber optic cable. Three Phase and Single Phase Risers will be built to take over existing loads in area. Project will combine with ASTCA telephone cables and crew. ASPA will share trenches with ASTCA for installation of telephone lines underground as well.
Project Objectives:	• Install underground power lines to reduce impact of disasters, namely power restoration. • Maintain reliability of availability of electrical sources to and within ASG and Public Facilities, ASPA Water Wells, ASPA Booster Stations. • Shelters will be more reliable with power availability. • Mitigate damages by Electric poles during high wind speeds, flooding and other types of disasters. • Harden ASPA Power System and increase ASPA's reliability to the community. • Restoration of power to ASPA Wells, Boosters, Private Businesses and Schools will be quick after a major cyclone because many lines are now underground and the amount of overhead lines are limited.
Estimated Cost:	$ 1,377,647.13
Project Duration:	1 year

Poloa To Fagamalu U/G Lines	
Project Description:	Project length 1.6 miles from Poloa to Fagali'i, 1.8 miles from Fagali'i to Moloata, and 1.2 miles from Maloata to Fagamalo. Project involves undergrounding the main primary lines, terminating wires in pad mount fiber boxes, and underground services to churches and water wells. The rest of the customers will be fed off from overhead service lines connected to underground primary lines. Install 3 x 2-1/2 inch conduits for electrical cables; install a single phase to feed present, provide 2 extra conduits on reserve in case we need to convert to phase three in future. ASPA will share trenches with ASTCA for the installation of underground telephone lines.
Project Objectives:	• Install underground power lines to minimize time for power restoration • Maintain reliability of availability of electrical sources to and within ASG & Public Facilities when disaster strikes. • Some of the listed facilities also serve as shelters and are relied on for availability of power to accommodate immediate needs. • Improve location of existing overhead lines set far away from equipment access.
Estimated Cost:	$970,523.75
Project Duration:	19 months

American Samoa Telecommunications Authority

Leone to Poloa U/G Communication Lines [5]	
Project Description:	This is an ASTCA project to replace overhead utility poles and cable with underground conduits and vaults. The project location is from Leone DCO to Poloa. The length of the road project is 29,040 feet. The scope of work includes excavation of a 2' x 3' x 29,040' deep trench, compaction of the subgrade, backfilling 6-inches of bedding, install 3no x 4" dia PVC conduits (schedule 40) side by side, place plastic spacers every 4' apart, imbedded in 3,000 psi concrete, backfill, and compact surface to existing top soil. Construct and install underground vaults every 500' apart of conduits.
Project Objectives:	The main objective of this project is to mitigate communications infrastructure consisting of fiber and copper cable from hurricane hazard impact. During the hurricane disaster event, utility poles and cables are a target for destruction by heavy winds, wave action, debris impact, fallen trees, etc. By constructing underground communications and utilities, damage will be very minimal and not disrupt utilities during a hurricane or other natural disaster.
Estimated Cost:	$3,270,350.60
Project Duration:	1 year

Afono Pass to Blue Sky Tower U/G Communication Lines	
Project Description:	This is an ASTCA project to replace overhead utility poles and cable with underground conduits and vaults. The project location is from Afono pass to Blue Sky tower. The length of the road project is 7,920 feet. The scope of work includes excavation of a 2' x 3' x 7,920' deep trench, compaction of the subgrade, backfilling 6-inches of bedding, install 3no x 4" dia PVC conduits (schedule 40) side by side, place plastic spacers every 4' apart, imbedded in 3,000 psi concrete, backfill, and compact surface to existing top soil. Construct and install underground vaults every 500' apart of conduits.
Project Objectives:	The main objective of this project is to mitigate communications infrastructure consisting of fiber and copper cable from hurricane hazard impact. During the hurricane disaster event, utility poles and cables are a target for destruction by heavy winds, wave action, debris impact, fallen trees, etc. By constructing underground communications and utilities, damage will be very minimal and not disrupt utilities during a hurricane or other natural disaster.
Estimated Cost:	$916,546.40
Project Duration:	1 year

5 Sagapolutele, Fili. (2014). "BLAST project passes federal audit "with flying colors" according to CEO". Samoa News: 06-30-2014. Retrieved September 30, 2014 from http://www.samoanews.com/content/en/blast-project-passes-federal-audit-flying-colors-according-ceo

Amouli to Aoa U/G Communication Lines	
Project Description:	This is an ASTCA project to replace overhead utility poles and cable with underground conduits and vaults. The project location is from Leone DCO to Poloa. The length of the road project is 10,560' feet. The scope of work includes excavation of a 2' x 3' x 10,560' deep trench, compaction of the subgrade, backfilling 6-inches of bedding, install 3no x 4" dia PVC conduits (schedule 40) side by side, place plastic spacers every 4' apart, imbedded in 3,000 psi concrete, backfill, and compact surface to existing top soil. Construct and install underground vaults every 500' apart of conduits.
Project Objectives:	The main objective of this project is to mitigate communications infrastructure consisting of fiber and copper cable from hurricane hazard impact. During the hurricane disaster event, utility poles and cables are a target for destruction by heavy winds, wave action, debris impact, fallen trees, etc. By constructing underground communications and utilities, damage will be very minimal and not disrupt utilities during a hurricane or other natural disaster.
Estimated Cost:	$1,208,042.00
Project Duration:	1 year

Fagaitua, Masefau, Masausi, Sailele U/G Communication Lines	
Project Description:	This is an ASTCA project to replace overhead utility poles and cable with underground conduits and vaults. The project location is from Leone DCO to Poloa. The length of the road project is 19,008 feet. The scope of work includes excavation of a 2' x 3' x 19,008' deep trench, compaction of the subgrade, backfilling 6-inches of bedding, install 3no x 4" dia PVC conduits (schedule 40) side by side, place plastic spacers every 4' apart, imbedded in 3,000 psi concrete, backfill, and compact surface to existing top soil. Construct and install underground vaults every 500' apart of conduits.
Project Objectives:	The main objective of this project is to mitigate communications infrastructure consisting of fiber and copper cable from hurricane hazard impact. During the hurricane disaster event, utility poles and cables are a target for destruction by heavy winds, wave action, debris impact, fallen trees, etc. By constructing underground communications and utilities, damage will be very minimal and not disrupt utilities during a hurricane or other natural disaster.
Estimated Cost:	$2,149563.68
Project Duration:	1 year

Lauli'I/Breaker's Point Tower Replacement Parts	
Project Description:	This is an ASTCA project to replace parts of the Breakers Point tower due to deteriorating parts from weather conditions.
Project Objectives:	The tower was installed in 1984, and due to environmental deterioration (weather condition), the tower needs replacement parts.
Estimated Cost:	$44,127.00
Project Duration:	1 year

Aunu'u Tower Replacement Parts	
Project Description:	This is an ASTCA project to replace parts of the Aunu'u tower due to deteriorating parts from weather conditions.
Project Objectives:	The tower was installed in 1984, and due to environmental deterioration (weather condition), the tower needs replacement parts.
Estimated Cost:	$44,127.00
Project Duration:	1 year

Manu'a Islands U/G Communication Lines	
Project Description:	This is an ASTCA project to replace overhead utility poles and cable with underground conduits and vaults. The project location is for Ta'u and Ofu Manu'a. The length of road is 52,800 feet. The scope of work includes excavation of a 2' x 3' x 52,800' deep trench, compaction of the subgrade, backfilling 6-inches of bedding, install 3no x 4" dia PVC conduits (schedule 40) side by side, place plastic spacers every 4' apart, imbedded in 3,000 psi concrete, backfill, and compact surface to existing top soil. Construct and install underground vaults every 500' apart of conduits.
Project Objectives:	To minimize and maintain uninterrupted communication services at various key facilities in Manu'a: o High Schools o Elementary Schools o Medical Dispensaries o ASG Buildings o ASTCA Digital Exchanges o Private sectors o All residents o Disaster Shelters
Estimated Cost:	$6,842,532.00
Project Duration:	1 year

Wind Shutters EOC Project	
Project Description:	The proposed shutter project will consist of a shutter system that can be manually operated from left to right or meet in the middle. These shutters do not have electronic motors and are dependent on staff to operate.

There is only one American Samoa government recognized EOC and this is housed in this enclosed building with an Importance Factor of 1.5 and Saffir-Simpson Hurricane wind scale of Category 3 (111-129 mph). Its occupancy category is 4. The building structure was built with intention that it can withstand wind force up to 120 mph but its physical location with an open parking lot leave all glass windows and doors unprotected from positive or negative wind pressures of wind speed up to 120 mph. All windows and doors on both ground and top level need protection from wind borne debris when threatened with strong enough winds that can be damaging.

This shutter project will decrease the damages to the buildings from strong winds within Category 3 wind speeds and partial damages to winds in higher categories 4 and 5.

Wind Shutters EOC Project	
Project Objectives:	• The shutter system is a proposed mitigation project to safeguard the ASDHS-TEMCO-EOC building. This is an office building belonging to the American Samoa government ASDHS which serves all 55,000 people of this Territory especially during emergencies. This 2010 Census population for the Territory was disputed by former statistician as should've been higher. For the purposes of this application, we will use the number officially recorded by the 2010 Census count. • This building is the new location for the main ASHDS office building centralizing all of its formerly separate office locations. ASDHS-TEMCO is the designated emergency management office that coordinates response efforts in the untimely event of a disaster whether manmade or natural. The building was formerly used as the Joint Field Office (JFO) by FEMA during the 2009 Samoa Earthquake and Tsunami recovery efforts in 2010. The building is also in compliance with the American Disability Act (ADA) with a lift on the side of the building for the physically disabled to walk up to the second floor. • Because this is a huge two story building with 12,800 sq feet for both top and ground level, it can serve as a shelter for employees who live farther away from the EOC. In addition to ASDHS employees, there are also first response liaison members and representatives from the Governor's office that can be on site to offer assistance during EOC activations and use it as a shelter in the meantime. But, currently, the building lacks a shutter system and this does not qualify it or allow it to meet the American Red Cross Standards for hurricane evacuation shelters (ARC 4496).
Estimated Cost:	$43,496.00
Project Duration:	12 months

Mapping Project	
Project Description:	ASCMP is proposing the development of hazard data, online tools and analysis to support the territories Hazard Mitigation Plan and provide a rapid analysis tool for decision makers. The project will achieve this goal through the following three components: Phase (1) Data Assessment and Development ***American Samoa Building Footprint:*** ASCMP will produce a new building footprint GIS layer from a 2012 Aerial Imagery and Light Detection and Ranging (LiDAR). The update of the territories building footprint layer is crucial for hazard analyses in the territory. The building footprint layer currently in use was derived from 2005 imagery and does not include infrastructure changes since 2005. The project will also leverage off island data sources including natural hazard datasets developed by the University of Hawaii and NOAA Coastal Services Center (CSC). These include tsunami impact modeling and sea level rise/ inundation datasets. ASCMP is currently in possession of the sea level rise data and will be seeking permission to include the tsunami data developed at the University of Hawaii. ***Participatory Mapping:*** ASCMP staff has worked closely with NOAA programs to facilitate participatory mapping workshops in the Fagaloa region of Tutuila. These workshops have focused on the collection of coastal and marine data for watershed mapping and analysis. Funding for this project will support future participatory mapping efforts to collect additional data in support of coastal hazard identification. These efforts greatly supplement current hazard data and engage local communities in the data development process. Most importantly, these workshops raise aware of natural hazards and help efforts to foster resilient communities. ***Hazards Geodatabase:*** ASCMP GIS is in possession of a variety of natural hazard GIS layers including landslide, flooding, tsunami and volcanism data. The metadata and sources of these datasets will be revisited and examined to determine the data integrity and applicability to hazard mitigation planning in the territory. A needs assessment of the data will be produce to assist in the planning and development of future datasets. All developed and reviewed GIS layers will be compiled into a centralized geodatabase hosted on ASCMP servers. Final GIS layers will include FGDC metadata and will available in a geodatabase format as outlined in the ASCMP annual data management plan.

Mapping Project	
Project Description:	(2) ArcGIS Online Mapping Hazard Mitigation and Coastal Resiliency Viewer ASCMP will launch and host an online mapping service through ArcGIS Viewer for Flex. The viewer will provide a smart, intuitive framework for looking at and interacting with hazard mitigation data online. The viewer will feature hazard data compiled in Phase one of the project, most notably the 2012 Building Footprint layer. It will include tools, widgets and features to view analyze and disseminate data pertaining to natural hazards relation to infrastructure. The tool would follow similar workflows as developed for the Land Use Web Portal system currently in place on ASDOC servers (http://portal.gis.doc.as/Landuse/) and will include a report generation tool with similar functionality. The report generation tool will prompt users to choose an area of interest such as a single building footprint, a highlighted area of interest (multiple building footprints), and or a selection based up an attribute of a boundary layer e.g., a village or district. Upon selecting the area of interest, the user can then generate a report detailing the proximity of the area of interest to different hazards. The American Samoa Hazard Mitigation and Coastal Resiliency Viewer will be hosted on ASDOC servers and continually updated as data becomes available. The viewer will be hosted on the ASDOCs and ASCMP web portal homepages. (3) Education, Outreach and Training ASCMP will conduct an internal (ASDOC) and external (ASG) training workshops to provide training on use of the American Samoa Hazard Mitigation and Coastal Resiliency Viewer. Training will help promote use and facilitate the use of the tools and data throughout the territory. Additionally, ASCMP distribute the geodatabase throughout the territory through the GIS users' group meetings.
Project Objectives:	• American Samoa Hazards Geodatabase • American Samoa Buildings Footprint layer • American Samoa Hazard Mitigation and Resiliency Online Viewer • Training Sessions for ASDOC and ASG
Estimated Cost:	$50,000.00
Project Duration:	2 years

Department of Parks and Recreation

Vaipito Stream Revetment	
Project Description:	During the 9/29 Tsunami, waves washed out the improved park land causing damages to the shoreline of Fagaalu Park. Community concern after the 9/29 Tsunami was brought forward in regards to Pago Pago village where Vaipito stream is not protected from erosion, flooding, storm surge waves, and tsunami. The stream area to be protected in this project is from the existing rock revetment at the mouth of Vaipito stream to behind Pago Plaza. This project proposal is based on the model for and cost per linear foot at 7ft height and 5ft width. The scope of work consists of the repair work and stabilization of stream embankment, identified under the jurisdiction of the Department of Park and Recreation. Project revetment includes 1280 LF.
Project Objectives:	Complete revetment at Vaipito Stream from 100ft in at mouth to behind Pago Plaza.
Estimated Cost:	$448,000
Project Duration:	180 days

Department of Public Works

#2 Landslide: Rte.6 (Afono, Masefau), Rte. 1 (Matuu, Gataivai)	
Project Description:	The proposed project is a permanent stabilization of higher grounds adjacent to the road by removing the loose rocks and soil that are potentially dangerous to the approaching traffic and reduce the severity of damages in some cases that cannot be avoided. Securing these areas to the slope so it will prevent sliding during heavy-longer rains and sheltering the improvement with earthen berms and fences/nets and installed signs to warn approaching traffic on potential sliding sites.
Project Objectives:	To minimize the danger of approaching traffic due to landslide that occurs during heavy-longer rains on the following sites; o Afono Pass - Afono Village, Route 006 o Masefau Landslide - Masefau Village, Route 006 o Fatu ma Futi - Matu'u Village, Route 001 o Blunt's Point - Gatavai Village, Route 001
Estimated Cost:	$4,000,000.00
Project Duration:	10 months

Landslide Mitigation Project

Ottoville Drainage Flood Mitigation	
Project Description:	Ottoville Drainage Flood Mitigation
Project Objectives:	• Mitigate spread of stream runoff as well as natural runoff. • Minimize risk of damage to government, public and business facilities/assets in the area. • ASTCA and ASPA will collaborate for ease of construction and minimizing costs.
Estimated Cost:	$683,000.00
Project Duration:	5 months

Fagaima Road Flood Mitigation	
Project Description:	To mitigate the spread of stream runoff as well as the natural runoff of the land within the watershed of the village by means of improving and defining a natural waterway that runs from the village of Fagaima. To minimize the risk of damage to government facilities/assets in the area within the Tafuna Flood Plain. Currently, Fagaima undergoes heavy flooding during periods of heavy rain due to blockage or the nonexistence of an outlet. This project will minimize this flooding problem currently experienced within the district, as well as be a means for the protection and safety for residents within the area and more so for the general

Fagaima Road Flood Mitigation	
Project Objectives:	• Mitigate spread of stream runoff as well as natural runoff. • Minimize risk of damage to government, public and business facilities/assets in the area
Estimated Cost:	$4,500,000.00
Project Duration:	2 years

Fatuoaiga Drainage Flood Mitigation	
Project Description:	Fatuoaiga Drainage Flood Mitigation
Project Objectives:	• Mitigate spread of stream runoff as well as natural runoff. • Minimize risk of damage to government, public and business facilities/assets in the area. • ASTCA and ASPA will collaborate for ease of construction and minimizing costs.
Estimated Cost:	$300,000.00
Project Duration:	2 years

#7 Electrical Upgrades Campus Grounds Drainage 10 Schools	
Project Description:	Flash flooding storm water run-off on the campus grounds of ten school locations has contributed to the deterioration of the electrical power distribution systems underground line feeds, affecting the electrical power needs of all facilities tied into the system. The ASDOE have a number of school sites which require a long overdue upgrading of their existing electrical distribution systems. Most specifically are the schools still utilizing the older "Fale" type classroom buildings, which were built in the early 1960's some 50 plus years ago. These schools electrical distribution are still being served from a main panel and power entry at one point (Fale/Kitchen bldg) and distributes to the various other "Fale" and other classroom buildings on site with underground service feed wires running from the main to each individual building. These underground wire feeds are not contained within PVC conduits. They are set directly into the ground. Over the years, most notably during the storm weather seasons erosion of the campus grounds have resulted in exposure of the insulated wire feeds, and signs of deteriorating insulation and exposed wire are common. The load demands of many buildings are exceeding the load capacity of the wire as well.

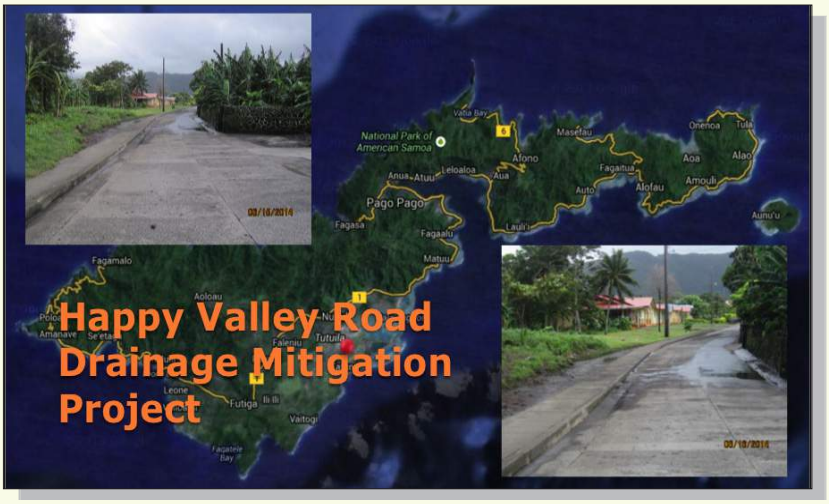
#7 Electrical Upgrades Campus Grounds Drainage 10 Schools	
	We have over the past 10 years been experiencing problems with these schools and have discovered the need to upgrade the distribution system with new properly rated wire in PVC conduit and installed to meet all present day NEIS and IBC Electrical standards, and to ensure the safety of our student and general public.
Project Objectives:	The assessment and Design of a properly approved (NEIS,IBC Electrical Standards) Electrical system for each individual school.
Estimated Cost:	$85,000.00
Project Duration:	12 months for first phase

ASDOE Schools Electrical Common Problems of 10 Schools

#6 Pava'ia'I Elementary	
Project Description:	Propose to upgrade the entire lower campus affected area with a engineered finish ground sloped run-off to redirect the storm water run-off to the designed lanes and upgraded soak pits strategically located to capture the immediate run-off volume, with the sloping graded areas between (3) of the (4) buildings paved via Pervious concrete which should allow for some additional drainage/seepage of the water run-off as it passes over, thereby decreasing the volume of run-off to the soak pits, and spill-over to the outside areas off the campus grounds. Construction of a properly designed Concrete Driveway entry apron at the entrance/exit Gateway with redesigned soak pits at both sides of the driveway to capture run-off water from the high area run. Installation of Rain Gutters on the (4) 2-Story Classroom Buildings to capture run-off from the building roofs and control the fall from the roof to the ground area, to prevent the erosion of the fill material from the base of the buildings and building foundation.

#6 Pava'ia'I Elementary	
Project Objectives:	Alleviate the overflow of accumulating run-off water originating from the fall and run-off of water from the Pavaiai Elementary Upper Campus grounds and (4) 2-Story Classroom Bldg. Structures at the lower Campus, causing major ground erosion to the affected lower campus grounds, washing away the finish top cinder grade and washing out the entire area between the buildings, and running out side of the campus ground to the village back road, Flooding the area with cinder debris and floodwaters washing over from the concrete roadway and pooling at various areas affecting the more immediately located residential structures around this side of the school.
Estimated Cost:	$310,000.00
Project Duration:	12 months

#5 Happy Valley Road Drainage	
Project Description:	The proposed project is to construct approximately 100 ft. L x 15 ft. W x 8 ft. D runoff trap structure at the low point within the area. The proposed runoff trap would mitigate the runoff from adjacent properties to ponds for days on the low point of the road. The proposed structure will also enhance infiltration and recharge to ground.
Project Objectives:	The proposed project objective is to protect property and health of the residents living within the area especially to schoolchildren. The proposed project is to mitigate the direct effect to the health of the school children walking to and from school because the area is natural low and runoff ponds for days during heavy rainfall. The proposed project is to avoid runoff from adjacent properties to sits on this low area of the road and prevent the area to be a mosquito breeding ground with foul smell due to decaying insects and small animals.
Estimated Cost:	$220,000.00
Project Duration:	8 months



Ili'ili Drainage Flood Mitigation	
Project Description:	To mitigate the spread of stream runoff as well as the natural runoff of the land within the watershed of the village by means of improving and defining a natural waterway that runs from the village of Ili'ili. To minimize the risk of damage to government facilities/assets in the area within the Tafuna Flood Plain. Currently, Ili'ili undergoes heavy flooding during periods of heavy rain due to blockage or the nonexistence of an outlet. This project will minimize this flooding problem currently experienced within the district, as well as be a means for the protection and safety for residents within the area and more so for the general
Project Objectives:	• Mitigate spread of stream runoff as well as natural runoff. • Minimize risk of damage to government, public and business facilities/assets in the area
Estimated Cost:	$1,310,000.00
Project Duration:	2 years

#1 Rockfall: Rte. 009 (utumea, Poloa, Amanave)	
Project Description:	The proposed project is a permanent stabilization of higher ground adjacent to the road by removing the loose rocks that are potentially dangerous to the approaching traffic and reduce the severity of damages in some cases that cannot be avoided. Securing these areas to the slope so it will prevent rocks falling to the road during heavy-longer rains and saturates the higher ground. The proposed improvement also includes sheltering the area with earthen berms and fences/ nets and installed signs to warn approaching traffic on potential sliding sites.
Project Objectives:	To minimize the danger of approaching traffic due to rockfall that occurs during heavy-longer rains on the following sites; o Utumea Village - Route 009 (between Seetaga and Agugulu Villages) o Boundary of Poloa and Amanave Villages - Route 09
Estimated Cost:	$2,400,000.00
Project Duration:	10 months

Permanent Landslide Repair Route 005	
Project Description:	Slope stabilization, which includes excavation, and benching to resist movement of loose material on the lower part of the slide. Install/construct drainage improvement to control surface and subsurface flow. Place retaining walls or crib walls as deemed necessary to prevent further spread of the slide on the access road.
Project Objectives:	To minimize the effect and damage of landslide during rainy days and to avoid closure of Route 005; Pago Pago-Fagasa Road. This road is an access to the northern part from Fagasa Village to the southern part and to other important government facilities like the hospital, fire station, and the DPS.
Estimated Cost:	$520,000.00
Project Duration:	6 months

#3 Amouli Stream Mitigation Project Ofu, Manu'a	
Project Description:	The proposed project is to improve stream flow capacity to prevent flooding on the residents within the area. The proposed improvement is consist of bankline stabilization to prevent soil erosion that would lower the flow capacity of the stream. The proposed improvement would lower the frequency of stream flow overflowing to the stream banks and floods the residents living adjacent to the stream.
Project Objectives:	The proposed project objective is to protect life and property adjacent to the stream. Residents along the stream always suffered flooding because of the existing stream low capacity.
Estimated Cost:	$300,000.00
Project Duration:	10 months

Afono Culvert Improvement	
Project Description:	Location-Closer to Afono Elementary School on Route 006. Bankline improvement on both sides of the stream using gabion basket for soil stabilization, and improving/replacing the existing culvert crossing to increase hydraulic capacity. Reconstruction of the seawall which will be affected during the construction of the outlet protective structure of the culvert to match to the existing seawall. Sidewalks constructed for safety of the pedestrian particularly to school children living nearby using this culvert to cross to other parts of the village. Improving drainage system would minimize future flooding particularly within the school premises. ***Environmental Concerns:*** Overflowing of stream runoff during heavy downpour on the lower bank always settled on the school ground. A nuisance flooding on the school turns out to be a health hazard to the residents particularly to the school children since stream runoff ponding on the school premises will not subside for at least a day or more and becomes a potential mosquito breeding ground. Minor modification of the existing waterway to increase the hydraulic capacity of the stream and the culvert.
Project Objectives:	Mitigation to prevent Afono Elementary School from flooding during heavy downpour due to overflowing of the stream on the lower bankline adjacent to the school and the insufficient capacity of the existing culvert to convey this stream runoff towards the shore.
Estimated Cost:	$250,000.00
Project Duration:	6 months

Vaitele Stream Flood Mitigation	
Project Description:	Located in the village of Nu'uuli and adjacent to the famous Shoe Tree Commercial Building, reconstruction of the existing damaged flood protection structure on upstream off of the main road (Route 001) and redefining/structural hardening of the stream bankline downstream off the main road. Access driveways will be constructed as necessary in order to continue stream flow without interruption and avoid unsafe condition to the pedestrian during high velocity stream flow which will cross on access driveways. ***Environmental Concerns:*** Stream runoff spreads and ponds on private/communal land which may damage property; Stream runoff ponding on the adjacent areas becomes a health hazard to the residents; Unsafe condition of the residents that will occur during heavy downpour; Property damaging during high rainfall intensity which usually creates high runoff velocity.
Project Objectives:	• Mitigate spread of stream runoff as well as natural runoff. • Minimize risk of damage to government, public and business facilities/assets in the area. • Prevent any further encroachments due to developments by redefining/ structurally hardening the stream bankline.
Estimated Cost:	$500,000.00
Project Duration:	6 months

#4 Leone Village Road	
Project Description:	The proposed project is to remove and replace all existing insufficient capacity culverts on this stream and construct drainage structures on the road to convey surface and stream overflow runoff to the outfall including reconstruction of the existing badly damage village road. The improvement will also include stream bank stabilization to selected areas where the existing stream bank is low and became a hazard to the residents due to overbanking of stream runoff. These improvements will enhance the village access road and protect life and properties within the area.

#4 Leone Village Road	
Project Objectives:	The proposed project is to protect life and properties of the people residing along the stream. Village residents suffer flooding every time during heavy rainfall due to stream runoff overflow to the road and residential areas. The insufficient capacity of the existing culverts and the lack of drainage structures on the village road made difficult for the public to access their homes because of the flooding on the road. Due to the insufficient capacity of these existing culverts, low stream bank lines and lack of drainage structures on the road, vehicles including emergency vehicles need to wait to let the flooding subsides before this village road can be accessed.
Estimated Cost:	$2,200,000.00
Project Duration:	10 months

Leone Village Road and Stream Mitigation Project

#8 Upgrading of DPW-M&O Building	
Project Description:	The M&O Building is a 120' x 400' steel portal frame structure and now serves as the main office the Department of Public Work. The intended occupancy and use of the building was altered wherein offices were built-in for the different divisions of DPW. The proposed project will involve repairs of its metal roof and cladding for leaks and damaged from previous tropical cyclone, structural strengthening and upgrading of its windows to withstand 120 miles wind. Install fire sprinkler system to keep the building safe from local fire.

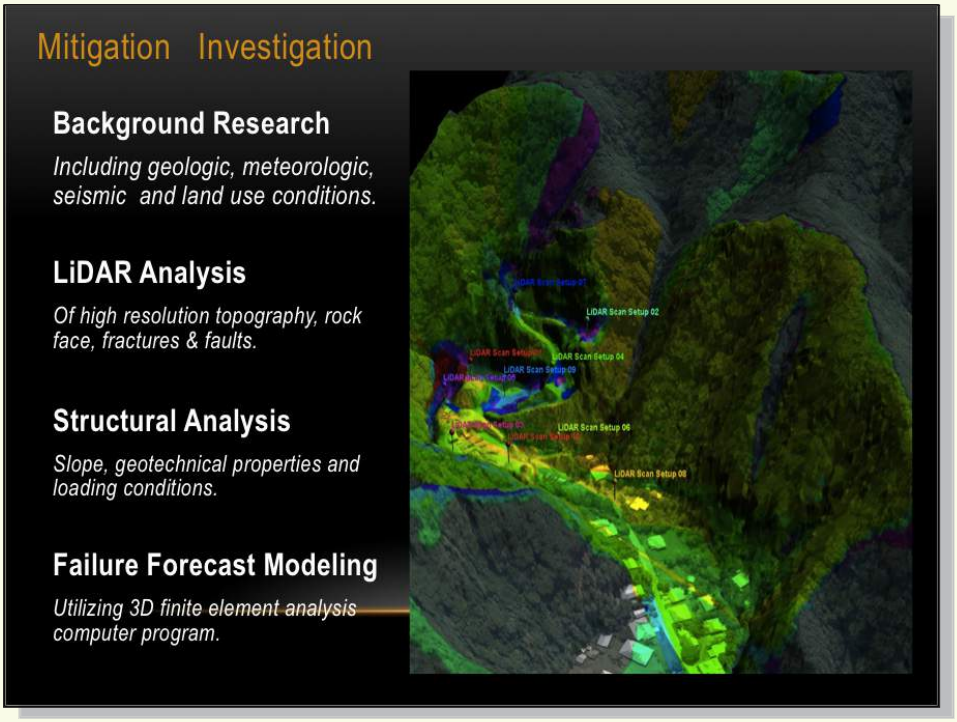
#8 Upgrading of DPW-M&O Building	
Project Objectives:	The proposed activity will reduce and/or eliminate the impact of damages caused by hurricane, tropical cyclones, and other windstorms and local fire by upgrading the building and installation fire protection system. This will allow the building to remain operational, safe and secure. The building serves as DPW base of operation during disaster response.
Estimated Cost:	$400,000.00
Project Duration:	5 months

Permanent Landslide Repair Route 11	
Project Description:	Slope stabilization, which includes excavation, and benching to resist movement of loose material on the lower part of the slide. Install/construct drainage improvement to control surface and subsurface flow. Place retaining walls or crib walls as deemed necessary to prevent further spread of the slide on the access road.
Project Objectives:	To minimize the effect and damage of landslide during rainy days and to avoid closure of Route 11; Masausi Road. This road is an access from the Village of Masausi and Village of Sailele to Fagaitua and to other important government facilities like the hospital and other parts of the island.
Estimated Cost:	$350,000.00
Project Duration:	6 months

American Samoa Environmental Protection Agency

Landslide Early Warning System – Faga'alu Pilot Project	
Project Description:	Due to recent excavation of cut slopes of a primary stabilizing geologic feature a critical risk for landslide hazard above the Faga'alu Quarry in near or long term is apparent. Current technology is available to provide early warning of the conditions precursory to slope failure and save many lives. The proposed project will analyze the Faga'alu Quarry landslide risk conditions, procure specialized equipment, deploy an early warning system and train local specialist to apply the early warning system at critical sites throughout American Samoa. LiDAR and field investigation of the slope above the high-risk quarry cut slope will be performed to current professional standards.

Landslide Early Warning System – Faga'alu Pilot Project	
Project Objectives:	• To perform geotechnical investigation of the landslide risk area to current professional standards. • To research and deploy a state of the art landslide early warning system to protect Faga'alu as a pilot project establishing training and developing local capacity to be used throughout American Samoa.
Estimated Cost:	$486,000.00
Project Duration:	12 months



High Court

High Court Elevation Project (Formerly High Court Relocation Project)	
Project Description:	Elevate High Court. 
Project Objectives:	• Mitigate damages caused by future disasters. • Avoid impairment following disaster. • Preservation of significant legal and historic documents. • Secure a safe and secure structure and location to accommodate the needs and requirements of the High Court and District Court to maintain fair and just services without variance.
Estimated Cost:	$2,750,000.00
Project Duration:	3 years

Office of Public Information

High Court Elevation Project (Formerly High Court Relocation Project)	
Project Description:	Dismantle and uninstall existing television equipment and move to safe storage facility; construct Temporary MCR. Move all contents to temporary location. Repair Building, Harden walls, Restructure interior of building to accommodate. Reinstall all dismantled equipment.
Project Objectives:	• Mitigate damages caused by future disasters. • Avoid impairment following disaster. • Preservation of significant historical contents. • Secure a safe and secure structure and location to accommodate the communication needs to the public.
Estimated Cost:	$4,500,000.00
Project Duration:	4 years

The following article found in the Samoa News describes the condition of the building:

Rehab or condemn— that is the question[6]

By B. Chen

blue@samoanews.com

An assessment of the KVZK-TV building in Utulei is underway to determine if the building, which was recently included on the National Register of Historic Places, is structurally sound and can be renovated or if it needs to be demolished. Local company Designer Plus, owned by Epenesa Jennings, is carrying out the assessment and according to Historic Preservation Officer David Herdrich, recommendations for rehabilitation will be made following the assessment and at that time, his office will look for funding to make it happen.

A look at the way the KVZK-TV building in Utulei stands today. Historic Preservation Officer David Herdrich said the current run-down state of the building is a result of years of neglect. [photo: B. Chen]

Figure 4 Samoa News Article Regarding KVZK TV Building

He said having the local TV station listed as a historic site means his office will step in and conduct renovation and restoration work, if necessary, on the building. KVZK-TV was the first television station in the Pacific Islands outside of Australia and New Zealand during a time when it was hard to recruit qualified teachers to work in the territory. H. Rex Lee, who was governor at the time, brought educational television here and with the support of Ohio Congressman Michael J. Kirwan, KVZK-TV became a reality. (The official name of the KVZK-TV building is the Michael J. Kirwan Educational Television Center). The KVZK-TV building is original except for the roof, which was replaced by FEMA after a hurricane. The building appears run down, both inside and out. Standing at the main entrance, one can look up and see three large window air conditioning units that are rusty and not operational - just dangling from the top. Some of the glass windows are missing and have been sealed off with wood pieces while the main door and exterior are three different shades of blue. Even the yellow paint on the side columns of the main entrance is peeled and cracked. Herdrich said the current state of the TV station is a result of many years of neglect. He said ASHPO can spend money to rehabilitate the building to extend its life, or otherwise, if the building is determined to be structurally unsound and there is just no way to rehabilitate it, then it would have to be condemned. He said in cases where there is no other choice but to tear a building down and erect a new one, a Memorandum of Agreement (MOA) with the American Samoa Historic Preservation Office will need to be signed to mitigate any "adverse effects" that may arise, per Historic Preservation Law. Mitigation in these cases, according to Herdrich, would typically mean that architects and engineers will be hired to document and photograph the building the way it stands today (before it is torn down), so information about it is not lost. "This is how we can preserve the history of the building and remember what it was once like." Herdrich said they are awaiting the assessment results from Designer Plus and from there, they will determine whether the building will need rehabilitation work —or be condemned.

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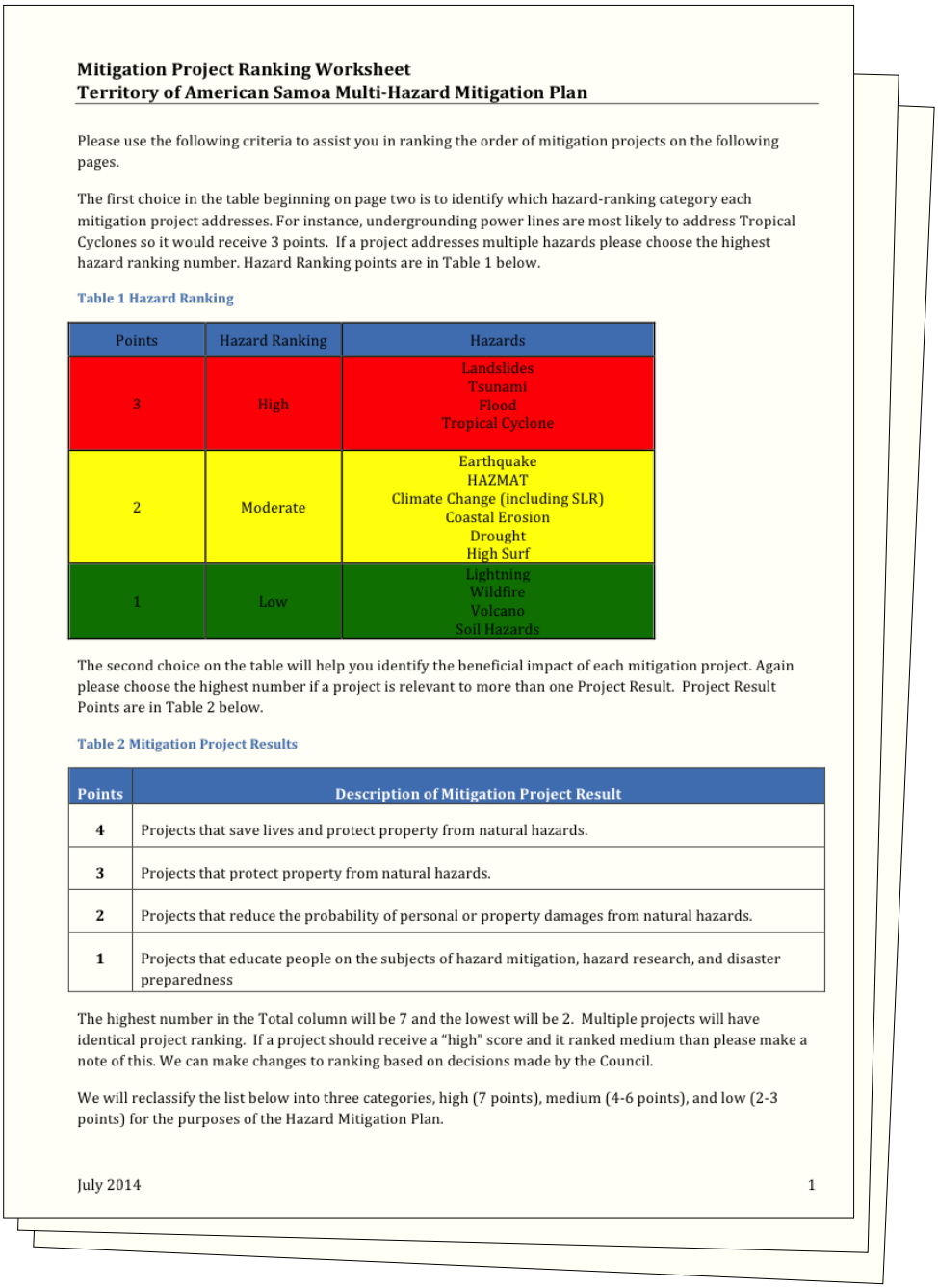
6 Chen, B. (2014). "Rehab or condemn - that is the question". Samoa News; 11-08-2013. Retrieved September 30, 2014 from http://www.samoanews.com/node/78850#sthash.PDNY54IR.dpuf.

Fuel Farm Relocation	
Project Description:	A new Aviation Fuel Farm will be constructed on the other side of Runway 8-26, further away from the public and airport users thus the Airport terminal and car park. A new fuel pipeline will run from this new site to the fuel pits on the Apron/Ramp area. The existing Aviation Fuel Farm, which is so close to the airport car park and terminal, will be demolished and relocated. This old site will be cleaned up for expansion of the Airport Carpark. 
Project Objectives:	To relocate the existing Aviation Fuel Farm and associated pipelines etc. to the new proposed site near Pala Lagoon inside the Airport Operations Area (AOA). This is to ensure that airport users and the public are safe from the high hazard of the existing location of the existing Aviation Fuel Farm poses when cyclones or natural disasters occur.
Estimated Cost:	$5,500,000.00
Project Duration:	18 months

Runway Shoreline Protection	
Project Description:	Proposed rock seawall/revetment will be designed and constructed along the Airport's shorelines to protect the Runways and Security Perimeter Fence and Road from wave action from cyclones or natural disasters. Total length of the Airport shoreline to be protected is 6350 LF.
Project Objectives:	• To protect the Runways, Security Perimeter Fence and Road from strong wave action, flooding and erosion occurring along the Airport shoreline and coastline. • Allow the Runways and Airport to remain operational, safe and secure after cyclones and storms to allow urgent relief aid and assistance to arrive via air quickly.
Estimated Cost:	$5,000,000.00
Project Duration:	12 months

The Planning Team developed a Project Ranking Worksheet for the Hazard Mitigation Council. The Worksheet gave the council an effective way to consider hazard vulnerability and relationship to the mitigation plan goal. The worksheet included the 26 new mitigation projects proposed to the Council and 26 projects from the previous plan. Figure 1 below is a copy of the directions associated with the Project Ranking Worksheet. The entire worksheet is shown in Appendix C as part of the July 11, 2014 Hazard Mitigation Council Meeting materials.



Mitigation Project Ranking Worksheet
Territory of American Samoa Multi-Hazard Mitigation Plan

Please use the following criteria to assist you in ranking the order of mitigation projects on the following pages.

The first choice in the table beginning on page two is to identify which hazard-ranking category each mitigation project addresses. For instance, undergrounding power lines are most likely to address Tropical Cyclones so it would receive 3 points. If a project addresses multiple hazards please choose the highest hazard ranking number. Hazard Ranking points are in Table 1 below.

Table 1 Hazard Ranking

Points	Hazard Ranking	Hazards
3	High	Landslides Tsunami Flood Tropical Cyclone
2	Moderate	Earthquake HAZMAT Climate Change (including SLR) Coastal Erosion Drought High Surf
1	Low	Lightning Wildfire Volcano Soil Hazards

The second choice on the table will help you identify the beneficial impact of each mitigation project. Again please choose the highest number if a project is relevant to more than one Project Result. Project Result Points are in Table 2 below.

Table 2 Mitigation Project Results

Points	Description of Mitigation Project Result
4	Projects that save lives and protect property from natural hazards.
3	Projects that protect property from natural hazards.
2	Projects that reduce the probability of personal or property damages from natural hazards.
1	Projects that educate people on the subjects of hazard mitigation, hazard research, and disaster preparedness

The highest number in the Total column will be 7 and the lowest will be 2. Multiple projects will have identical project ranking. If a project should receive a "high" score and it ranked medium than please make a note of this. We can make changes to ranking based on decisions made by the Council.

We will reclassify the list below into three categories, high (7 points), medium (4-6 points), and low (2-3 points) for the purposes of the Hazard Mitigation Plan.

July 2014 1

Figure 5 Mitigation Project Ranking Worksheet Directions

The Hazard Mitigation Council utilized the worksheet in their July 11, 2014 meeting. The Hazard Mitigation Council removed all wave action projects at this meeting. They made several other changes to the master list of 2011 projects and proposed 2014 projects. ASPA's #3 project in 2011 is their #4 project on the 2015 list. DPW assumed responsibility for projects #5 and #26 from the 2011 plan. ASTCA received funding for projects #4, 8, 10, and 28 in 2011 so they were removed. Project #25 from 2011 was corrected to say Vaitele Stream instead of Tago Stream. The Hazard Mitigation Council encouraged ASTCA, ASPA and BlueSky Communications to coordinate on all undergrounding projects. The results are shown in Table 6 Mitigation Projects Ranked By Hazard Mitigation Council below. The intent of the Planning Team was for the Hazard Mitigation Council to work as a group to determine values for the worksheet. However, the Hazard Mitigation Council held a group discussion and then each member of the Hazard Mitigation Council completed the worksheet. Therefore, scores were totaled from all participants to determine the values below. The projects are listed in order of points from highest to lowest. To assist with future decision making regarding project implementation, the 41 projects are divided into three categories:

1. Highest Priority Projects (scored 62-75 points)
2. Medium Priority Projects (scored 48-61 points)
3. Lowest Priority Projects (scored 35-47 points)

The project locations are shown in the two Figures following the table below.

Table 6 Mitigation Projects Ranked By Hazard Mitigation Council

Ranking	Agency	Project Title	Hazard Ranking	Mitigation Project Result Points	Total Points
Highest Priority Projects (scored 62-75 points)					
1	Port	Fuel Farm Relocation	33	42	75
2	ASPA	Water Wells Mitigation	30	39	69
3	ASPA	Water Tanks Mitigation	30	39	69
4	ASPA	Fagatogo Reservoir Mitigation	29	37	66
5	Port	Runway Shoreline Protection	30	36	66
6	DPW	#2 Landslide: Rte.6 (Afono,Masefau), Rte.1 (Matuu,Gataivai)	27	38	65
7	DPW	Ottoville Drainage Flood Mitigation	30	34	64
8	DPW	Fagaima Road Flood Mitigation	29	34	63
9	DPW	Fatuoaiga Drainage Flood Mitigation	30	33	63
10	DPW	#7 Electrical Upgrades Campus Grounds Drainage 10 Schools	27	36	63
Medium Priority Projects (scored 48-61 points)					
11	ASPA	Tafuna Wastewater Treatment Plant	27	34	61
12	DPW	#6 Pava'ia'I Elementary	27	33	60
13	ASPA	Faga'alu Booster Station	26	34	60

Ranking	Agency	Project Title	Hazard Ranking	Mitigation Project Result Points	Total Points
14	ASPA	Pago Water Booster Station Mitigation	26	34	60
15	ASPA	Utumoa River Flood Mitigation	26	33	59
16	ASTCA	Leone to Poloa U/G Communications Lines[7]	26	33	59
17	ASTCA	Afono Pass to Blue Sky Tower U/G Communications Lines	26	32	58
18	ASTCA	Amouli to Aoa U/G Communications Lines	26	32	58
19	ASTCA	Fagaitua,Masefau,Masausi,Sailele U/G Comm. Lines	26	32	58
20	DOC	Mapping Project	25	33	58
21	ASPA	Weather Proof Sewage Lift Stations	25	33	58
22	ASTCA	Lauli'I/Breaker's Point Tower Replacement Parts	25	32	57
23	EPA	Landslide Early Warning System - Faga'alu Pilot Project	25	31	56
24	ASTCA	Aunu'u Tower Replacement Parts	24	31	55
25	ASTCA	Manu'a Islands U/G Comm. Lines	24	31	55
26	OPI	Office Of Public Information Building	24	29	53
27	DPW	#5 Happy Valley Road Drainage	22	27	49
28	DPR	Vaipito Stream Revetment	23	25	48
29	DHS	Wind Shutters EOC Project	20	28	48
Lowest Priority Projects (scored 35 – 47 points)					
30	DPW	Ili'ili Drainage Flood Mitigation	21	26	47
31	DPW	#1 Rockfall: Rte.009 (Utumea, Poloa, Amanave)	22	25	47
32	ASPA	Nuuuli To Mesepa U/G Lines	19	27	46
33	DPW	Permanent Landslide Repair Route 005	20	23	43
34	ASPA	Poloa To Fagamalo U/G Lines	18	24	42
35	HC	High Court And District Court Building Relocation - Change to Elevation Project	20	22	42
36	DPW	#3 Amouli Stream Mitigation Project Ofu, Manu'a	20	22	42

Ranking	Agency	Project Title	Hazard Ranking	Mitigation Project Result Points	Total Points
37	DPW	Afono Culvert Improvement	16	24	40
38	DPW	Tago Vaitele Stream Flood Mitigation (Name Correction Passed By Council)	18	22	40
39	DPW	#4 Leone Village Road	17	22	39
40	DPW	#8 Ugrading of DPW-M&O Building	17	21	38
41	DPW	Permanent Landslide Repair Route 11	16	19	35

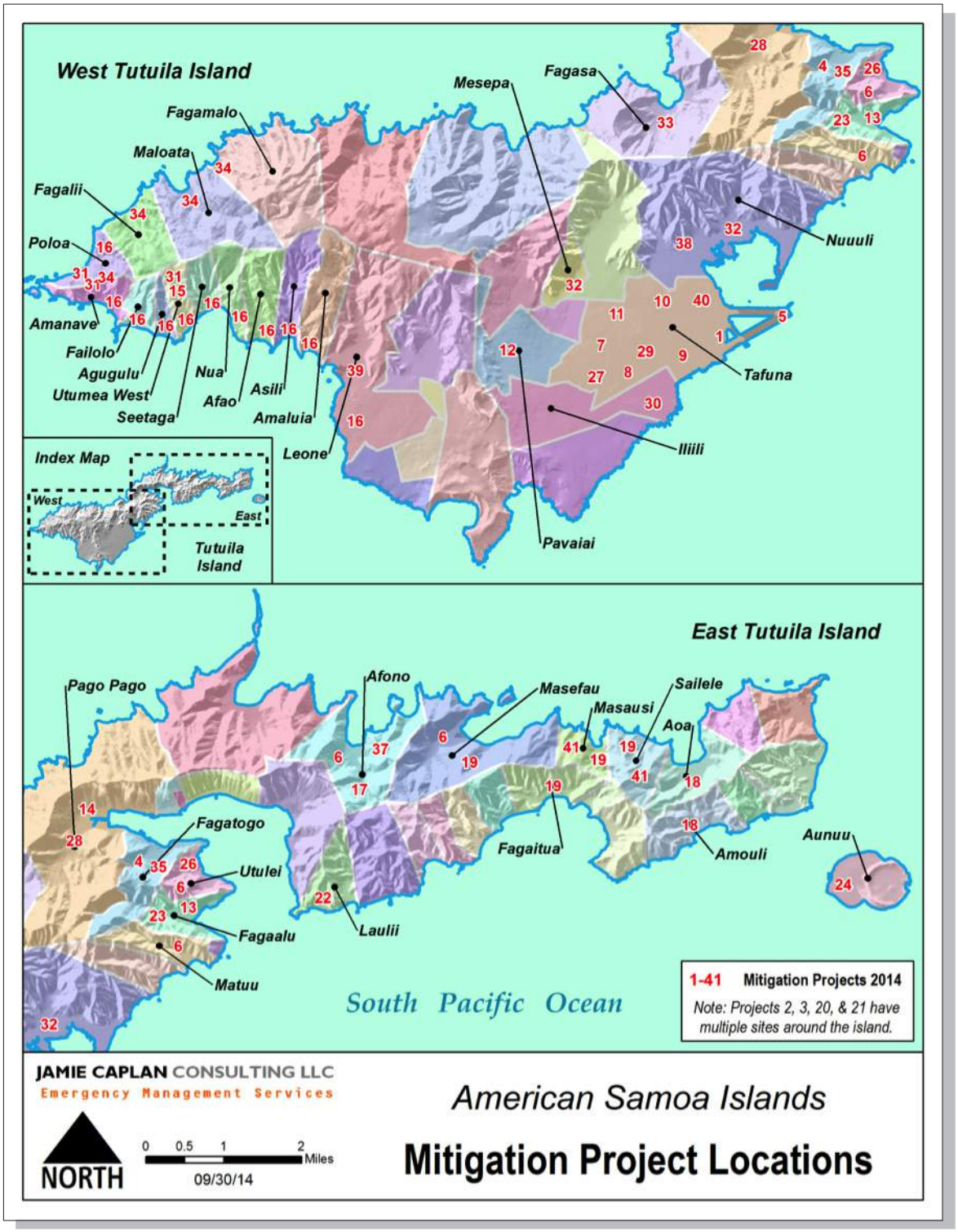


Figure 6 Mitigation Project Locations Map 1

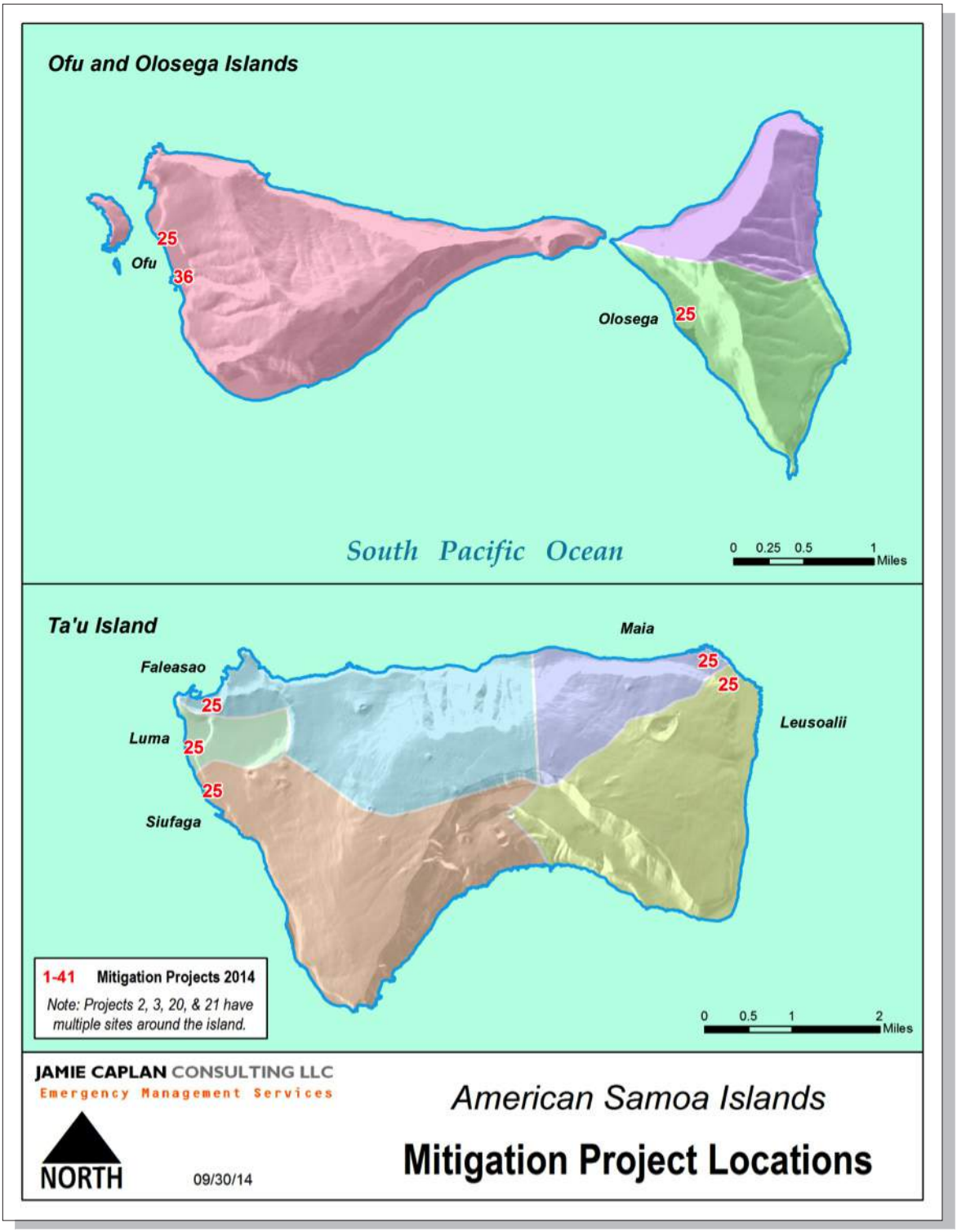


Figure 7 Mitigation Project Locations Map 2

Ten organizations submitted projects to the Hazard Mitigation Council. Table 7 Mitigation Projects Sorted by Department is shown below. The projects are in priority order for each department; the departments are listed in alphabetical order.

Table 7 Mitigation Projects Sorted by Department

Agency	Project Title	Hazard Ranking	Mitigation Project Result Points	Total Points
ASPA				
ASPA	Water Wells Mitigation	30	39	69
ASPA	Water Tanks Mitigation	30	39	69
ASPA	Fagatogo Reservoir Mitigation	29	37	66
ASPA	Tafuna Wastewater Treatment Plant	27	34	61
ASPA	Faga'alu Booster Station	26	34	60
ASPA	Pago Water Booster Station Mitigation	26	34	60
ASPA	Utumoa River Flood Mitigation	26	33	59
ASPA	Weather Proof Sewage Lift Stations	25	33	58
ASPA	Nuuuli To Mesepa U/G Lines	19	27	46
ASPA	Poloa To Fagamalo U/G Lines	18	24	42
ASTCA				
ASTCA	Leone to Poloa U/G Communications Lines	26	33	59
ASTCA	Afono Pass to Blue Sky Tower U/G Communications Lines	26	32	58
ASTCA	Amouli to Aoa U/G Communications Lines	26	32	58
ASTCA	Fagaitua,Masefau,Masausi,Sailele U/G Comm. Lines	26	32	58
ASTCA	Lauli'I/Breaker's Point Tower Replacement Parts	25	32	57
ASTCA	Aunu'u Tower Replacement Parts	24	31	55
ASTCA	Manu'a Islands U/G Comm. Lines	24	31	55
DHS				
DHS	Wind Shutters EOC Project	20	28	48
DOC				
DOC	Mapping Project	25	33	58
DPR				
DPR	Vaipito Stream Revetment	23	25	48
DPW				
DPW	#2 Landslide: Rte.6 (Afono,Masefau), Rte.1 (Matuu,Gataivai)	27	38	65
DPW	Ottoville Drainage Flood Mitigation	30	34	64
DPW	Fagaima Road Flood Mitigation	29	34	63
DPW	Fatuoaiga Drainage Flood Mitigation	30	33	63
DPW	#7 Electrical Upgrades Campus Grounds Drainage 10 Schools	27	36	63

Agency	Project Title	Hazard Ranking	Mitigation Project Result Points	Total Points
DPW	#6 Pava'ia'I Elementary	27	33	60
DPW	#5 Happy Valley Road Drainage	22	27	49
DPW	Ili'ili Drainage Flood Mitigation	21	26	47
DPW	#1 Rockfall: Rte.009 (Utumea, Poloa, Amanave)	22	25	47
DPW	Permanent Landslide Repair Route 005	20	23	43
DPW	#3 Amouli Stream Mitigation Project Ofu, Manu'a	20	22	42
DPW	Afono Culvert Improvement	16	24	40
DPW	Vaitele Stream Flood Mitigation (Name Correction Passed By Council)	18	22	40
DPW	#4 Leone Village Road	17	22	39
DPW	#8 Ugrading of DPW-M&O Building	17	21	38
DPW	Permanent Landslide Repair Route 11	16	19	35
	EPA			
EPA	Landslide Early Warning System - Faga'alu Pilot Project	25	31	56
	HC			
HC	High Court And District Court Building Relocation - Change to Elevation Project	20	22	42
	OPI			
OPI	Office Of Public Information Building	24	29	53
	PORT			
Port	Fuel Farm Relocation	33	42	75
Port	Runway Shoreline Protection	30	36	66

Table 8 Project Benefits and Costs

Table 8 Project Benefits and Costs below shows the projects in priority order based on organization. The environmental impact, historical preservation impact, risk of hazard impact, and protection of life and property are characterized for each project with a ranking of high, medium or low. These rankings were given by the organization submitting the project. The projects are color coded, red, orange, and yellow to indicate their level of priority from high to low.

Priority	Project Name	Environmental Impact	Historical Preservation Impact	Risk of Hazard Impact	Protection of Life and Property	Cost
ASPA						
2	Water Wells Mitigation	High	Low	Low	High	$1,000,000.00
3	Water Tanks Mitigation	High	Low	High	High	$10,000,000.00
4	Fagatogo Reservoir Mitigation	Medium	Medium	High	High	$300,000.00
11	Tafuna Wastewater Treatment Plant	High	Low	High	High	$450,000.00
13	Faga'alu Booster Station	High	Low	Medium	High	$200,000.00
14	Pago Water Booster Station Mitigation	High	Low	Medium	High	$200,000.00
15	Utumoa River Flood Mitigation	Low	Medium	High	Medium	$257,500.00
21	Weather Proof Sewage Lift Stations	High	Low	High	High	$300,000.00
32	Nuuuli To Mesepa U/G Lines	Low	Low	High	High	$ 1,377,647.13
34	Poloa To Fagamalo U/G Lines	Low	Low	High	High	$970,523.75
ASTCA						
16	Leone to Poloa U/G Communications Lines	Low	Low	High	High	$3,270,350.60
17	Afono Pass to Blue Sky Tower U/G Communications Lines	Low	Low	High	High	$916,546.40
18	Amouli to Aoa U/G Communications Lines	Low	Low	High	High	$1,208,042.00
19	Fagaitua,Masefau,Masausi,Sailele U/G Comm. Lines	Low	Low	High	High	$2,149,563.68
22	Lauli'I/Breaker's Point Tower Replacement Parts	Low	Low	High	High	$44,127.00
24	Aunu'u Tower Replacement Parts	Low	Low	High	High	$44,127.00
25	Manu'a Islands U/G Comm. Lines	Low	Low	High	High	$6,842,532.00
DHS						
29	Wind Shutters EOC Project	Low	Low	Medium	Medium	$43,496.00

Priority	Project Name	Environmental Impact	Historical Preservation Impact	Risk of Hazard Impact	Protection of Life and Property	Cost
			DOC			
20	Mapping Project	High	Medium	High	High	$50,000.00
			DPR			
28	Vaipito Stream Revetment	High	High	High	High	$448,000
			DPW			
6	#2 Landslide: Rte.6 (Afono,Masefau), Rte.1 (Matuu,Gataivai)	High	Low	High	High	$4,000,000.00
7	Ottoville Drainage Flood Mitigation	High	Medium	High	High	$683,000.00
8	Fagaima Road Flood Mitigation	High	Medium	High	High	$4,500,000.00
9	Fatuoaiga Drainage Flood Mitigation	High	Medium	High	High	$300,000.00
10	#7 Electrical Upgrades Campus Grounds Drainage 10 Schools	Low	Low	High	Medium	$85,000.00
12	#6 Pava'ia'I Elementary	High	Medium	High	High	$310,000.00
27	#5 Happy Valley Road Drainage	High	Low	High	High	$220,000.00
30	Ili'ili Drainage Flood Mitigation	Low	Low	High	High	$1,310,000.00
31	#1 Rockfall: Rte.009 (Utumea, Poloa, Amanave)	High	Low	High	High	$2,400,000.00
33	Permanent Landslide Repair Route 005	High	Low	High	High	$520,000.00
36	#3 Amouli Stream Mitigation Project Ofu, Manu'a	High	Low	High	High	$3000,00.00
37	Afono Culvert Improvement	Medium	Low	High	High	$250,000.00
38	Vaitele Stream Flood Mitigation (Name Correction Passed By Council)	High	Low	High	High	$500,000.00
39	#4 Leone Village Road	High	Low	High	High	$2,200,000.00
40	#8 Ugrading of DPW-M&O Building	Medium	Low	High	High	$400,000.00
41	Permanent Landslide Repair Route 11	Medium	Low	High	High	$350,000.00
			EPA			
23	Landslide Early Warning System - Faga'alu Pilot Project	High	High	High	High	$486,000.00

Priority	Project Name	Environmental Impact	Historical Preservation Impact	Risk of Hazard Impact	Protection of Life and Property	Cost
High Court						
35	High Court and District Court Building Relocation - Change to Elevation Project	High	High	High	High	$2,750,000.00
OPI						
26	Office of Public Information Building	Medium	High	High	High	$4,500,000.00
PORT						
1	Fuel Farm Relocation	High	High	High	High	$5,500,000.00
5	Runway Shoreline Protection	High	High	High	High	$5,000,000.00

Table 9 Projects Sorted by Department and Color Coded by Priority show the projects with their associated cost. This table is provided as an easy reference for departments that submitted projects.

Table 9 Projects Sorted by Department and Color Coded by Priority

Priority	Project Name	Cost
ASPA		
2	Water Wells Mitigation	$1,000,000.00
3	Water Tanks Mitigation	$10,000,000.00
4	Fagatogo Reservoir Mitigation	$300,000.00
11	Tafuna Wastewater Treatment Plant	$450,000.00
13	Faga'alu Booster Station	$200,000.00
14	Pago Water Booster Station Mitigation	$200,000.00
15	Utumoa River Flood Mitigation	$257,500.00
21	Weather Proof Sewage Lift Stations	$300,000.00
32	Nuuuli To Mesepa U/G Lines	$ 1,377,647.13
34	Poloa To Fagamalo U/G Lines	$970,523.75
ASTCA		
16	Leone to Poloa U/G Communications Lines	$3,270,350.60
17	Afono Pass to Blue Sky Tower U/G Communications Lines	$916,546.40
18	Amouli to Aoa U/G Communications Lines	$1,208,042.00
19	Fagaitua,Masefau,Masausi,Sailele U/G Comm. Lines	$2,149,563.68
22	Lauli'I/Breaker's Point Tower Replacement Parts	$44,127.00
24	Aunu'u Tower Replacement Parts	$44,127.00

Priority	Project Name	Cost
25	Manu'a Islands U/G Comm. Lines	$6,842,532.00
	DHS	
29	Wind Shutters EOC Project	$43,496.00
	DOC	
20	Mapping Project	$50,000.00
	DPR	
28	Vaipito Stream Revetment	$448,000
	DPW	
6	#2 Landslide: Rte.6 (Afono,Masefau), Rte.1 (Matuu,Gataivai)	$4,000,000.00
7	Ottoville Drainage Flood Mitigation	$683,000.00
8	Fagaima Road Flood Mitigation	$4,500,000.00
9	Fatuoaiga Drainage Flood Mitigation	$300,000.00
10	#7 Electrical Upgrades Campus Grounds Drainage 10 Schools	$85,000.00
12	#6 Pava'ia'I Elementary	$310,000.00
27	#5 Happy Valley Road Drainage	$220,000.00
30	Ili'ili Drainage Flood Mitigation	$1,310,000.00
31	#1 Rockfall: Rte.009 (Utumea, Poloa, Amanave)	$2,400,000.00
33	Permanent Landslide Repair Route 005	$520,000.00
36	#3 Amouli Stream Mitigation Project Ofu, Manu'a	$3000,00.00
37	Afono Culvert Improvement	$250,000.00
38	Vaitele Stream Flood Mitigation (Name Correction Passed By Council)	$500,000.00
39	#4 Leone Village Road	$2,200,000.00
40	#8 Ugrading of DPW-M&O Building	$400,000.00
41	Permanent Landslide Repair Route 11	$350,000.00
	EPA	
23	Landslide Early Warning System - Faga'alu Pilot Project	$486,000.00
	High Court	
35	High Court and District Court Building Relocation - Change to Elevation Project	$2,750,000.00
	OPI	
26	Office of Public Information Building	$4,500,000.00
	PORT	
1	Fuel Farm Relocation	$5,500,000.00
5	Runway Shoreline Protection	$5,000,000.00

Mt. Alava

During the stakeholder meetings in April and June multiple organizations mentioned their concern for the road up Mt. Alava and the equipment that is on the top of the mountain. A remedy is not proposed specifically as a mitigation project in the list above; however, the Planning Team deems it necessary to include.

The summit of Mt. Alava has radio towers for the entire first response community (police and Emergency Medical Service) and TV station. The site also has generators on the mountain. Transformers are not secured or protected. The site is currently very inaccessible for repairs and maintenance due to the poor and dangerous road condition leading to the summit of Mt. Alava. The entire first response system is vulnerable due to this situation. The impediment is that the road is in the National Park and the NPS wants to keep the road unimproved. This is really a DHS-to-FEMA issue. The other option is to rebuild the cable car as a secondary access. The National Park Service wants the road to remain natural as a hiking trail. A Hawaii engineer has looked at the situation and recommends moving the generator to the bottom, so it can be repairable without the long drive/hike up mountain. Road repair could be in 5-or-10 year CIP. The best option is to fix the road and still have a hiking trail. The article below from the Samoa News describes the situation on Mt. Alava.

The tragic state of the Mt. Alava Tramway or cable car [7]
Sat, 04/12/2014 - 1:13pm By Rev. Dr. Mose Mose, Jr.

> I had been to the island several times, but I had not been a tour guide to some family members from California who had not experienced the many sites on the island of Tutuila. We toured the East and the West, as far as the historic village of Leone to the mystical village of Vaitogi, and to the east where the scenic village of Vatia and equally photogenic village of Aoa, seemed to encompass the overall beautiful Polynesian place call American Samoa.
>
> I was shocked when our tour took us up Mauga o Alii, where the Tramway that crossed over the deep Pago Pago Bay stirred up a deep sense of nostalgia which was a mixture of pleasant memories and a remembrance of a traumatic event that imprinted a powerful sense of loss in my psyche as an eighteen year old senior from Fagaitua High School, who among the many students from elementary and high schools were unaware of the catastrophe that changed the most celebrated event of our government's history—Flag Day-- since it became known as the Territory of American Samoa. The year 1980, on April 17th, marked a sad day among the years since the Flag Day Celebrations on Tutuila and Manu'a islands had commemorated the ceding of the Eastern Samoan islands to the United States. I wanted to remember the Tramway as a place filled with good memories with my grandfather, the late Saofolau Popese Malemo, who had been an engineer for the Tramway. I used to take rides with him from the Mauga o Alii side to the top of Mt. Alava, when I was just nine years old. My grandfather told me that when the Tramway was first built, the cable lines were pulled up with heavy machines at Atu'u village. These cable lines were heavy and any mistake could cause a tragic accident. He recalled how he narrowly escaped being crushed by the heavy machine when one of the cables snapped suddenly while being pulled up to the Mt. Alava, but his close friend and coworker was not so fortunate; his coworker was crushed to death by the heavy machine.

7 Mose Jr., Rev. Dr. Mose. (2014). "The tragic state of the Mt. Alava Tramway or cable car". Samoa News; 04-12-2014.. Retrieved September 30, 2014 from http://www.samoanews.com/content/en/tragic-state-mt-alava-tramway-or-cable-car

It will be thirty-four years ago this April 17, 2014, that another tragic event happened that caused the lives of several Navy personnel and a civilian. That tragic event also destroyed the beautiful and iconic Rainmaker Hotel, the first hotel built in American Samoa. I can clearly remember the many hundreds of elementary and high school students lining up where their own schools were directed for the procession on the sunny morning. Dignitaries from many Island countries and visiting tourists, with the hundreds of locals and neighboring Western Samoans coming to be a part of the celebration.

A new event was scheduled before the procession when it was announced by the Master of Ceremony that some paratroopers would parachute right down the middle of Malae o le Talu as a tribute to those sons and daughters of American Samoa serving in the Armed Forces. Three paratroopers landed away from the Malae o le Talu, landing over some houses above Fagatogo and in the hills. We were concerned and alarmed as we worried about their safety, with some not understanding the danger. But two were able to land on the field with great precision. A great round of applause erupted out of the crowd as these brave men landed safely. And with almost eerie silence, our attention was immediately turned toward the Pago Pago harbor, where from beyond the Pago Pago bay mountain range, the airplane that carried the paratroopers was taking a low flying swoop across the water in between the Mt. Alava height and Mauga o Alii Tramway port. As a slow motion picture of horror, the airplane flew between two cables when the rear fin of the airplane was clipped and snapped off. The realization of the tragedy hit us with sudden panic as the airplane flew briefly towards the ocean before slanting towards the Rainmaker hotel and burst into flames. The crowds in the Malae o le Talu were running in every direction. The applause that filled the Malae o le Talu earlier was now replaced with cries of fear and chaos.

The event of thirty-four years ago during our Flag Day celebration this year must not be forgotten. The rusted condition of the Tramway cable car, the vines growing over the steel platform of the cable car, the missing structure of the platform for the Tramway, the broken cables lying on the side of the road, the memorial dedicated to the lost lives stood filled with moss, and broken down paint, and the dumped trash over the side, sent a powerful message that we have forgotten the memory of what made our history. I wondered about the next generation of elementary and high school students who will be watching the Flag Day celebration of 2014 if they have any idea of the important history being eroded and erased from our memory. The Tramway cable car is an important fixture of history that is hidden from the history books, and the memorial dedicated to those who lost their lives must not be left to rot and forgotten.

If anyone reads this "cry in the wilderness," and stands up to lend your voice to my cry, a great shout will be heard in our land that we do not want to forget the important stories of our people. If the leaders in the Fono hear this call, please stand with me and bring our people to remembrance of the sacrifice that others gave and the values of important sites to our people and to those who come to visit our islands.

What needs to happen are: a) the Tramway car and structure on Mauga o Alii must be preserved as a national treasure; b) the Memorial must be preserved as a national treasure; and c) the Mauga o Alii pathway must be preserved and documented as a tourist attraction. I pray that our people will have a wonderful and safe celebration.

Happy Flag Day! God bless American Samoa.

How the Territory Supports Local Mitigation through Funding and Technical Assistance

Historically, all counties in Tutuila and the Manu'a Islands have received benefits from mitigation projects constructed and completed over the past two decades. All mitigation project-funding decisions are the responsibility of the Hazard Mitigation Council for the benefit of all the citizens through strengthening of critical facilities, flood control projects, and other mitigation projects.

The criteria for which projects receive funding rests with the active, well-informed, and well-educated Hazard Mitigation Council the advisory authority. The Council has demonstrated a history of prioritization on past mitigation projects based on criteria described in this plan. All of the counties in Tutuila and the Manu'a Islands are considered for local funding through the master mitigation project list presented above, in this chapter. The Hazard Mitigation Council understands that funding opportunities may present themselves in an order that is different than the project priority order. For this reason, projects are frequently funded in what appears to be a random order.

An important island-centric issue to mention is the extraordinary time and distance issues related to completing any and all projects in American Samoa and all the Pacific islands: FEMA project timelines are not very flexible and do not consider logistics related to the Pacific Islands. Transportation and logistics of shipping goods and services to the islands can add many months to a typical project. Transport of heavy equipment requires extra costs and time. Director Fugate's Administrative aid noted this issue at an April 29-May 1, 2014 Pacific Preparedness Partnership Meeting; FEMA Director Fugate was there on April 30. American Samoa has also noted that only a few individuals within FEMA are familiar with the islands – turnover at FEMA continues this lack of familiarity and experience with island issues.

The Hazard Mitigation Council and ODAPM will continue to take advantage of the various funding programs available and described herein for the projects that have been developed, scrutinized, prioritized, and described via this Mitigation Plan Update planning process.