

Summary: Office of Management and Budget

S-1 Title of Proposed Action

Supplemental Watershed Plan and Environmental Assessment (Plan-EA) for Santaquin East Bench Flood Prevention - Santaquin Watershed

S-2 County, State

Utah County, Utah

S-3 Congressional District

Third Congressional District

S-4 Sponsoring Local Organization

Santaquin City

S-5 Authority

The original watershed work plan was prepared, and works of improvement have been installed, under the authority of the Watershed Protection and Flood Prevention Act of 1954 (Public Law 83-566) as amended.

S-6 Cooperating Agency

United States Department of Agriculture Forest Service

S-7 Purpose and Need for Action

The proposed action would install permanent flood damage reduction measures along the Santaquin east bench to protect residents, businesses, and public infrastructure from future damage. The objective of the project is to provide substantial flood reduction from the 100-year-storm event (95%) and to prevent flooding from the 25-year fire-related event and debris flow from the 5-year storm event (i.e., 20% chance storm).

The purpose of the project is to control stormwater flooding and associated debris flow off Santaquin's east bench hillsides and reduce potential damages to private properties and public infrastructure. The proposed action is needed because currently the study area lacks natural drainage channels to convey stormwater and debris flow away from residential and commercial properties along Santaquin's east bench and critical public infrastructure. Currently, due to the lack of natural channels in the area, stormwater and debris flow coming off the east bench results in flooding conditions on the alluvial fan landscape where flows have historically occurred.

S-8 Description of the Preferred Alternative

The Proposed Alternative includes five (5) separate debris basins at strategic locations associated with the drainage areas. The NRCS designed all of the debris basins to channelize flooding and debris flows into debris basins that would be excavated into the hillsides, each with a principal spillway and a 50-foot-wide concrete structural auxiliary spillway to allow for a controlled release of water from the debris basins into existing channels or into the existing flow patterns that would be the drainage corridor absent the basin. These debris basins would be below grade to the extent possible to reduce the risk of failure and to blend in with the natural hillsides to minimize impact on the watershed, as well as save on the cost of construction and maintenance.

S-9 Resource Information

Table S-1 lists relevant resource information for the Santaquin East Bench project.

TABLE S-1-1. EXISTING RESOURCE INFORMATION

Resource	Description
Elevation and Topography	Project located on the eastern bench of Santaquin at approximately 5000 - 5800 feet mean sea level (msl)
Latitude/Longitude	Subwatershed 1 – 39.9818, -111.7354; Subwatershed 2 – 39.9691, -111.7535; Subwatershed 3 – 39.9716, -111.7564; Subwatershed 4 – 39.9709, -111.7432; Subwatershed 5 – 39.977, -111.7428; Subwatershed 6 – 39.9818, -111.7354
Climate	Annual high temperature – 62.1° F Annual low temperature – 38.8° F (https://www.usclimatedata.com/climate/santaquin/utah/united-states/usut0228)
Average Annual Precipitation/ Snowfall	Rainfall – 18.83 inches Snowfall – 53 inches (https://www.usclimatedata.com/climate/santaquin/utah/united-states/usut0228)
Hydrologic Unit Numbers	HU-816020202
Debris Basin Subwatershed Areas	<ul style="list-style-type: none"> • Subwatershed 1 – 0.6266 square miles; • Subwatershed 2 – 0.0688 square miles; • Subwatershed 3 – 0.0531 square miles; • Subwatershed 4 – 0.6875 square miles; • Subwatershed 5 – 0.7109 square miles; • Subwatershed 6 – 0.4510 square miles
Land Uses	Open space, agricultural, residential and commercial, public infrastructure
Land Ownership	Public, private
Population and Demographics	<p>The study area is located in Santaquin City, Utah, which had a population of 9,128, based on 2010 U.S. Census data.</p> <p>White: 89.3% Black or African American: 0.4% American Indian/Alaskan Native: 0.8% Asian: 0.1% Native Hawaiian/Other Pacific Islander: 0.1% Some Other Race: 6.1% Two or More Races: 1.4% Hispanic or Latino (of any race): 12.0%</p>

S-10 Alternative Plans Considered

Two alternative plans were considered in detail. The alternatives considered included:

- No Action Alternative: consists of no flood prevention improvements in the study area. No construction or permits would be required, nor would there be a need for on-going maintenance of flood prevention facilities; however, Santaquin would need to respond with

real-time mitigation and clean-up actions should a flooding event occur. It does not meet the purpose and need for the project as it would not provide attenuation of flooding events nor prevent debris flow from damaging residential, commercial, and agricultural properties or public infrastructure.

- Debris Basins Alternative (Option B): The Debris Basins Alternative, Option B includes five (5) separate debris basins at strategic locations associated with the drainage areas. Flooding and debris flows would be directed into the debris basins excavated into the hillsides, each a principal spillway, and a 50-foot-wide concrete structural auxiliary spillway to allow for a controlled release of water from the debris basins into existing channels or into the existing flow patterns that would be the drainage corridor absent the basin. These debris basins would be below grade to the extent possible to reduce the risk of failure and to blend in with the natural hillsides to minimize impact on the viewshed, as well as save on the cost of construction and maintenance.

An alternative to remove or relocate homes in potential flood areas was considered but eliminated early due to both cost and concerns over willing landowners versus eminent domain procedures. Four other structural alternatives were considered during the planning process, but those proposed flood prevention measures that would not meet the purpose and need for the project or that were considered to be not prudent or feasible for other reasons, including unacceptable impacts to environmental resources or high costs of construction or maintenance were eliminated. These included:

- Check Structures Only
- Diversion Berms
- Flow Impediments/Level Spreaders
- Debris Basin with Extensive Downstream Pipe Network (Option A)

S-11 Project Costs and Funding Source

The breakdown of the estimated installation cost for the Debris Basin Alternative is summarized in Table S-2. NRCS design engineering, construction management, and NRCS incurred administration costs are not cost-shared by the sponsor. Any costs incurred for administration and real property acquisition by the sponsor would not be cost-shared by NRCS.

TABLE S-1-2. SUMMARY OF COST DISTRIBUTION FOR THE DEBRIS BASIN ALTERNATIVE

Measure	Construction	Engineering	Real Property Rights	Admin.	Total
Basin 1	\$2,643,408	\$440,418	\$924,000	\$22,021	\$4,029,847
Basin 3A	\$570,133	\$95,022	\$300,000	\$4,751	\$969,906
Basin 4	\$1,060,079	\$176,680	\$700,000	\$8,834	\$1,945,593
Basin 5	\$2,554,266	\$425,711	\$58,100	\$21,286	\$3,059,363
Basin 6	\$1,265,467	\$210,911	\$788,000	\$10,546	\$2,274,924
Total	\$8,093,353	\$1,348,742	\$2,770,100	\$67,438	\$12,279,633

S-12 Project Benefits

The primary benefits from the project measures come from an anticipated reduction in the estimated average annual damages to residential properties, agricultural production, and municipal infrastructure. Table S-3 shows the estimated average annual damage reduction benefits.

TABLE S-1-3. ESTIMATED AVERAGE ANNUAL DAMAGE REDUCTION BENEFITS

Item	Estimated Average Annual Damage Reduction Benefits		
	No Action	Preferred Alternative	Damage Reduction Benefits
Crops and pasture	\$400	\$4,900	\$4,500
Residential	\$34,300	\$488,700	\$454,400
Other	\$800	\$3,000	\$2,200
Total	\$35,500	\$496,600	\$461,100

S-13 Net Economic Benefits

The Debris Basin Alternative has a benefit cost ratio for the Debris Basin Alternative of 1.16 to 1.

S-14 Period of Analysis

The Debris Basin Alternative was analyzed for a period of 100 years, which includes the implantation period.

S-15 Project Life

The debris basins are anticipated to have a life span of 100 years.

S-16 Environmental Impacts

Table S-4 lists the resources of concern and impacts associated with the Debris Basin Alternative. Resources that would not be impacted by the project are not listed in this table.

TABLE S-4. RELEVANT ENVIRONMENTAL RESOURCES

Resource	Issue	Discussion
Soils		
Soils and Geologic Characteristics	Excavation required for the construction of proposed debris basins and associated features	The project would have an impact on soils in the study area during construction of the debris basin since the debris basins would require extensive excavation, but would not impact soil composition or otherwise impact geologic resources. The potential exists for impacts on the proposed flood prevention measures as a result of seismic activity, although the likelihood for seismic activity is low.
Upland Erosion	Erosion of upland soils impacting properties and infrastructure	The project would have a short-term increase in erosion during construction of the debris basins; however, protection measures would be installed during construction.
Sedimentation	Prevention of debris flow	Debris basins are designed to catch sediment and flood flows during runoff events and reduce flood damage to properties below.
Water Resources		

Resource	Issue	Discussion
Hydrology	Prevention of flooding events from impacting properties and infrastructure	The project would have a minor alteration to the runoff hydrology in the project area in that it would catch flood flows to be safely released through the structures into historic drainage paths.
Floodplain Management	Prevention of flooding events from impacting properties and infrastructure	No FEMA-mapped floodplains are located in the study area. The debris basins would provide flood protection for properties below and are designed with outlets from the debris basins directing drainage into historic drainage paths.
Air		
Air Quality	Fugitive dust issues during construction	Construction activities would have temporary impacts to air quality in the study area.
Vegetation		
Vegetation Communities/Habitat	Disturbing existing vegetation communities	Construction of the Debris Basin Alternative would temporarily impact existing vegetation communities and habitat. Disturbed areas would be reseeded with native vegetation in exposed, disturbed areas. Permanent impacts would result in those areas converted to flood prevention measures.
Invasive Species	Construction activity that would disturb soils and allow for potential spread of invasive species	Due to construction activities, there is the potential to spread invasive species. BMPs would be used during construction to prevent the introduction or spread of invasive species.
Wildlife		
Wildlife Communities	Disturbance to wildlife due to construction activities	There would be temporary impacts to wildlife communities during construction due to noise and other construction-related activities. No wildlife communities would be adversely impacted long-term.
Human Environment		
Land Use	Required land acquisition	The proposed action would require land acquisition for the new drainage features (i.e., debris basins and associated structures), as well as easements for induced flooding concerns. Any needed land for the proposed debris basins would be acquired by Santaquin without any NRCS involvement, as the PL 83-566 Watershed Program does not authorize funding for land acquisition.

Resource	Issue	Discussion
Scenic Beauty/ Visual Resources	Anticipated changes to the natural views in the study area due to the inclusion of new flood prevention mitigation measures	The proposed action would introduce new drainage features (i.e., debris basins and associated structures) into the viewshed. The majority of the project improvements would be below grade, with the extent of the visual intrusion into the viewshed dependent upon the height of dam structures, which varies by site.
Public Health and Safety	Prevention of flooding and debris flow events from impacting properties and infrastructure	The proposed action would address public health and safety concerns by reducing the risk of future flooding and debris flows from impacting residential and agricultural properties and public infrastructure.
Socioeconomics	Prevention of flooding and debris flow events from impacting properties and infrastructure	Due to the protection of private lands and public infrastructure with the implementation of flooding protection measures, the proposed action would protect existing and future properties, infrastructure, land uses and provide community peace of mind during flood events.

S-17 Major Conclusions

The Preferred Alternative for the project is the Debris Basin Alternative under Option B and is based on the ability of the elements of the alternative to meet the purpose and need for the project and provide the most beneficial impacts to environmental and social resources (see Chapter 5).

S-18 Areas of Controversy and Issues to be Resolved

There are no anticipated areas of controversy. Issues to be resolved include property acquisition.

S-19 Evidence of Unusual Congressional or Local Interest

There is no evidence of unusual congressional or local interest.

S-20 In Compliance

This report is in compliance with executive orders, public laws, and other statutes governing the formulation of water resource projects.