

*Runoff Engineering Inc.*



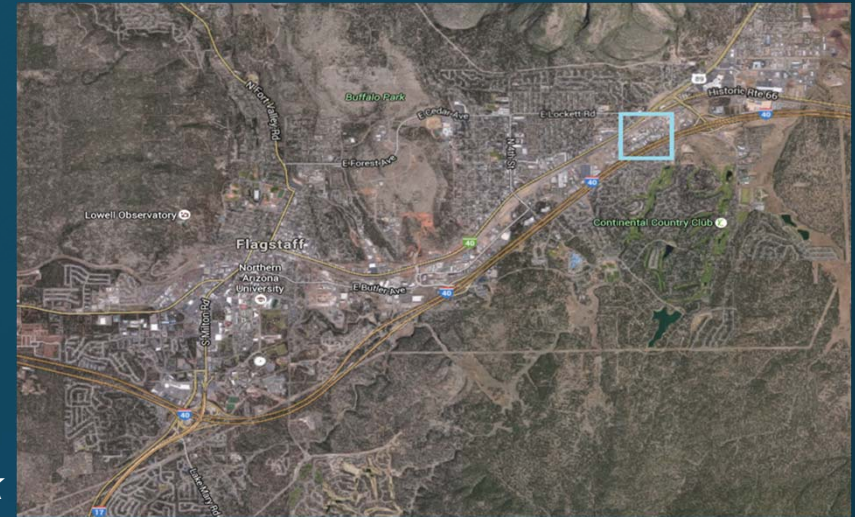
## Flagstaff Family Food Bank Flooding

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# Introduction

- **Client** — Joshua Spears at Flagstaff Family Food Bank
- **Location** — East Flagstaff, Arizona
- **Problem Statement** — Flooding causing damages to property

*Flagstaff Network*



*Site Location*



# Flooding

Before Heavy Rain Event



During Heavy Rain Event



*Same Location – Across From Food Bank*

Photos Courtesy of Donna Curry, City of Flagstaff Engineer Specialist



# Project Evolution

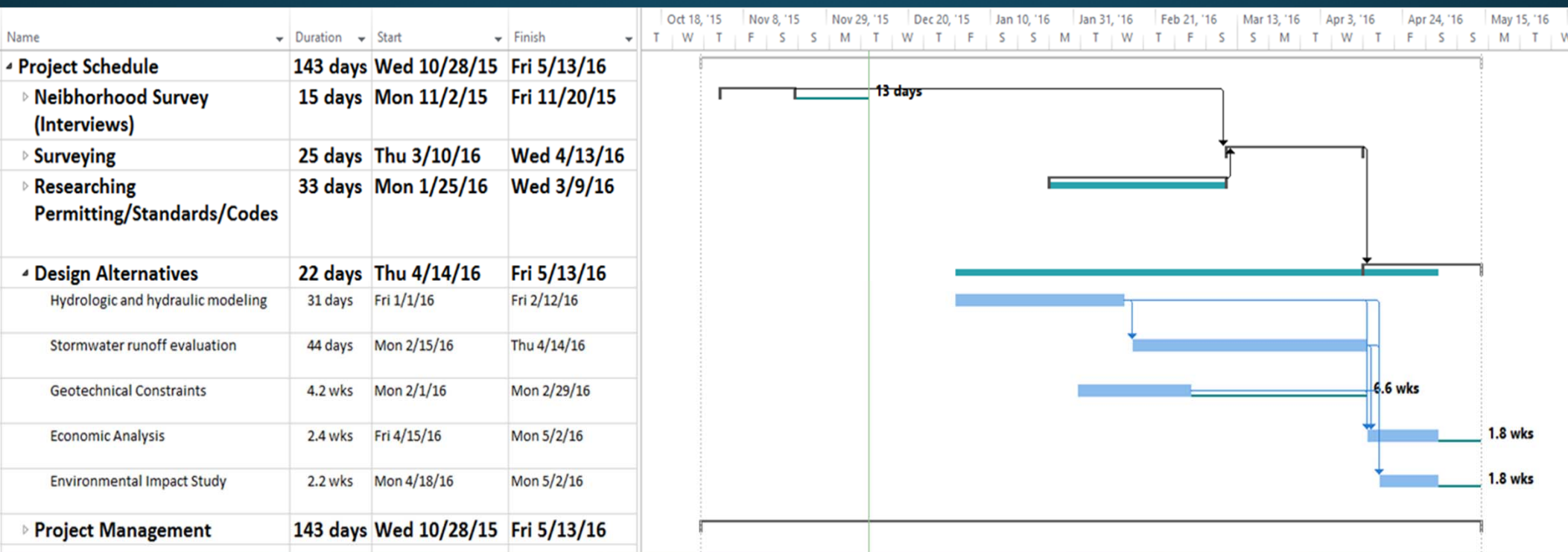
- Initial Flooding Area
- Final Flooding Area
- Neighborhood Assessment
- Collaboration with the City of Flagstaff
  - Stakeholders
  - Liability



# Scope

- Project Management
- Site Evaluation
  - Neighborhood Assessment
  - Drainage Evaluation
  - City Collaboration
- Permitting/Standards/Codes
  - City Drainage Codes
  - ADOT Drainage Codes
  - Property Rights
- Surveying
  - Topographic maps
- Design Alternatives
  - Hydrologic/Hydraulic Modeling
  - Geotechnical Analysis
  - Economic/Environmental Impacts

# Schedule



# Staffing Hours

Staffing				
Task	SENG	ENG	LAB	AA
<b>Project Management</b> -Meetings -Scheduling -Documentation	22	14	14	20
<b>Research</b> -Site evaluation -Neighborhood survey -Codes/legal standards	15	65		10
<b>Analysis</b> -Surveying -Geotechnical -Hydrological -Environmental		220	80	
<b>Final Design</b> -Final Proposals -Presentation -Website	160	40		20
Subtotal	197	339	94	50
Total (hrs)	<b>680</b>			



# Staffing Costs

Cost Estimate for Engineering Services				
1.0 Personnel	Classification	Hours	Rate, \$/hr	Cost
	SENG	197	194	\$ 38,218
	ENG	339	67	\$ 22,713
	LAB	94	48	\$ 4,512
	AA	50	56	\$ 2,800
	Total Personnel			\$ 68,243
2.0 Travel	7 meetings @ 10 mi/meeting		\$0.56/mi	\$ 39
3.0 Total				\$ 68,282

# Questions