



**Drainage Master
Plan and Water
Use Study**

Planning Advisory
Committee
Meeting #1
August 21, 2018

Grand Canyon National Park Airport



AGENDA

- Introductions
- Project Overview
- Draft Data Collection and Existing Conditions Report and Comments
- Next Steps



INTRODUCTIONS



PROJECT TEAM

- Matthew Smith (ADOT, Airport Manager)
- Lee McCleary (ADOT, Past Airport Manager)
- Bob Haneline (Dibble, Project Manager)
- Charlie McDermott (Dibble, Sr. Project Planner)
- Nanette Pageau (Kaneen Communications, Public Outreach)



PAC AGENCY MEMBERS

Arizona Department of Transportation
Arizona Game & Fish
Arizona State Land Department
Coconino County
Federal Aviation Administration
Grand Canyon Airlines
Grand Canyon National Park
Grand Canyon National Park Airport
Havasupai Tribe
KT Consulting, LLC
Hydro Resources
Maverick Airlines
National Park Service
Papillon Grand Canyon Helicopters
Sierra Club
Sierra Club, Grand Canyon Chapter
Town of Tusayan
USDA Forest Service – Kaibab National Forest



PROJECT OVERVIEW & GOALS



- **Drainage Master Plan**
 - Develop an FAA-compliant Drainage Master Plan
- **Water Use Study**
 - Estimate Future Water Demands (matching 2017 Airport Master Plan)
 - Evaluate Alternatives for Providing Increased Potable Water Source(s)



PROJECT PHASES

- Data Collection and Existing Conditions Analysis
- Alternatives Analysis and Master Plan
- Final Drainage Master Plan, Phase Implementation and Cost Analysis

LEGEND

- - - Airport Property Line
- 10' Ground Contours
- Runway Protection Zone (RPZ)
- Intermediate Term Program
- Long Term Program
- Taxiway Designation
- 35' Building Restriction Line (BRL)
- General Aviation Development Potential
- Non-Aviation Development Potential
- To Remain Vacant for Underground Utilities
- Private Development/Beyond Planning Period

INTERMEDIATE TERM (Years 6-10)

- 1 Construct Blast Pads (Both Runway Ends)
- 2 Replace Airfield Generator
- 3 Rehabilitate Existing Terminal Roadways and Parking Lots
- 4 Environmental Assessment - Terminal Building Replacement - *Not Pictured*
- 5 Equipment Purchase - ARFF Truck - *Not Pictured*
- 6 Equipment Purchase - Deicing Equipment to Service Larger Aircraft - *Not Pictured*
- 7 Upgrade Perimeter Access Road on East and West Sides of Airfield
- 8 Construct Helipad Between ARFF Facility and Terminal Apron
- 9 Construct Dedicated Airport Maintenance Facility
- 10 Design New Replacement Terminal Building and Associated Infrastructure - *Not Pictured*
- 11 Replace VASI-4 with PAPI-4 on Runway 21
- 12 Construct New Replacement Terminal Building
- 13 Construct Associated Vehicle Access/Parking to Serve Replacement Terminal Building
- 14 Relocate Airport Housing for Non-Aviation Development Potential*
- 15 General Airfield Pavement Maintenance - *Not Pictured*

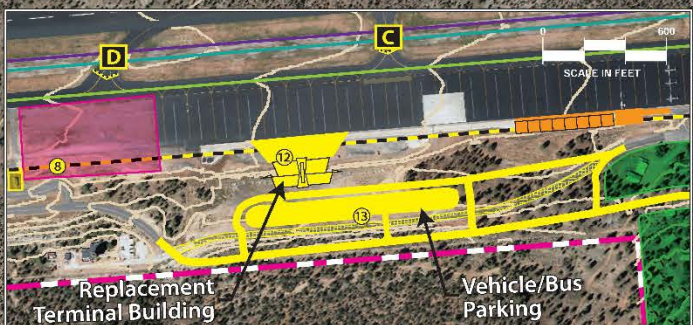
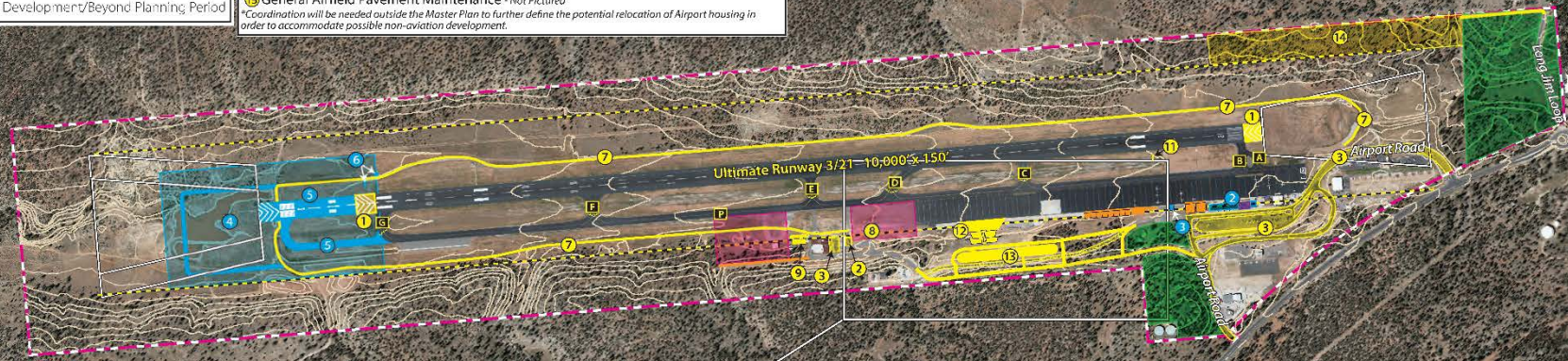
*Coordination will be needed outside the Master Plan to further define the potential relocation of Airport housing in order to accommodate possible non-aviation development.

LONG TERM (Years 11-20)

- 1 Environmental Assessment - Runway 3-21 Extension - *Not Pictured*
- 2 Redevelop Existing Terminal Area for Aviation Use (Site Preparation)
- 3 Implement Self-Service Fuel Facility/Fuel Farm
- 4 Site Preparation for Runway 3-21 Extension (Clearing, Grading, Relocated Perimeter Access Road)
- 5 Extend Runway 3-21 1,001' Southwest and Associated Parallel Taxiway P
- 6 Relocate Navigational Aids (Glide Slope Antenna, PAPI-4, and REILs)
- 7 General Airfield Pavement Maintenance - *Not Pictured*

KEY

- PAPI - Precision Approach Path Indicator
- VASI - Visual Approach Slope Indicator
- REIL - Runway End Identification Light
- ARFF - Aircraft Rescue and Firefighting



NEW AIRPORT MASTER PLAN



***Grand Canyon National Park Airport
Drainage Master Plan and Water Use Study
Data Collection and Existing Conditions Analysis Report***

ADOT Project No.: ADOT18-00007491
Dibble Engineering Project No.: 1017095

July 30, 2018

Prepared For:



Arizona Department of Transportation

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DRAFT DATA COLLECTION AND EXISTING CONDITIONS ANALYSIS REPORT



DATA COLLECTION - DRAINAGE



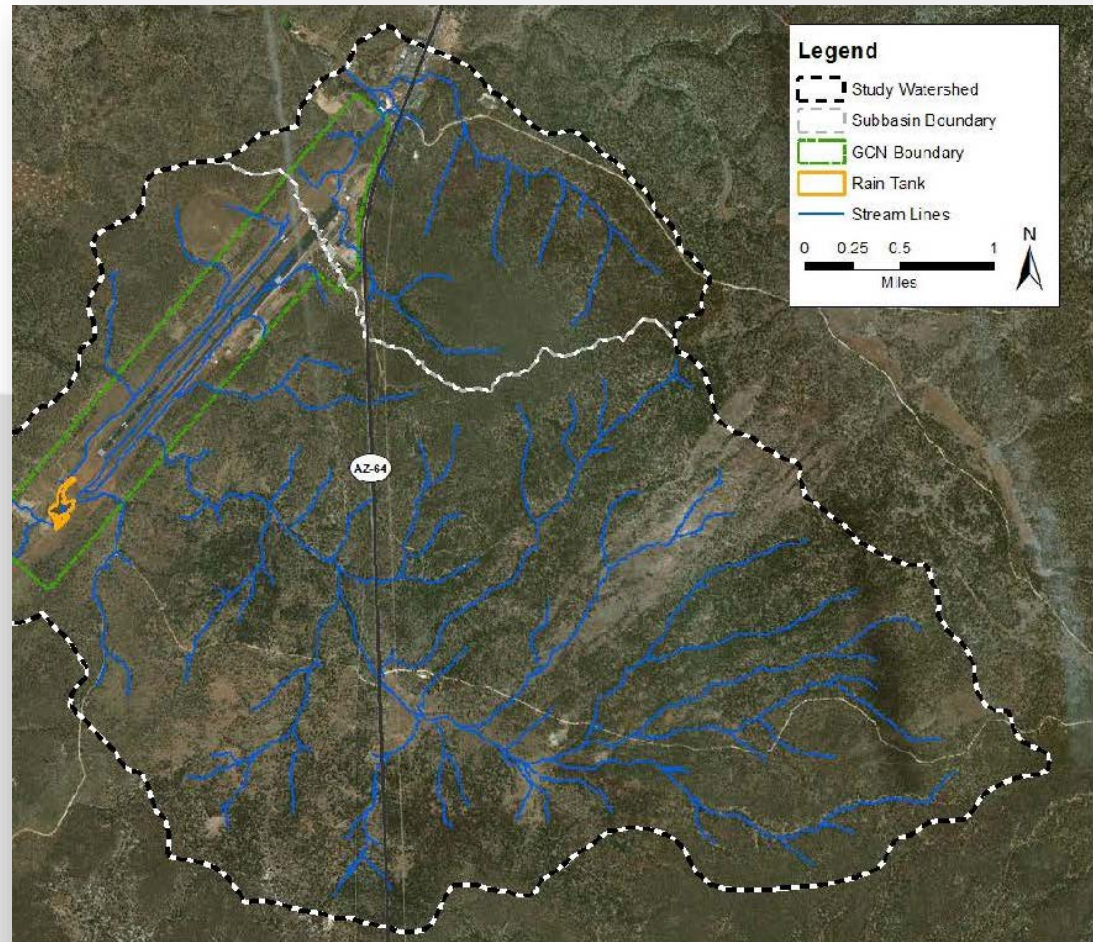
- 2 Site Visits
- Staff Interviews
- Review of GCN Documents
- Publicly Available Information





WATERSHED

- 16 Square Mile Area
- Mostly Forest Cover
- 2 Subbasins



2 - Stream Lines Based on Topography



KNOWN (MINOR) FLOODING ISSUES





DATA COLLECTION - WATER



- 3 Site Visits
- Staff Interviews
- Review of GCN Documents
- Review of Usage Meter Data
- Publicly Available Information





WATER USAGE

- Data from 2008-2017
- Better Data from 2014-2017
- Four User Groups

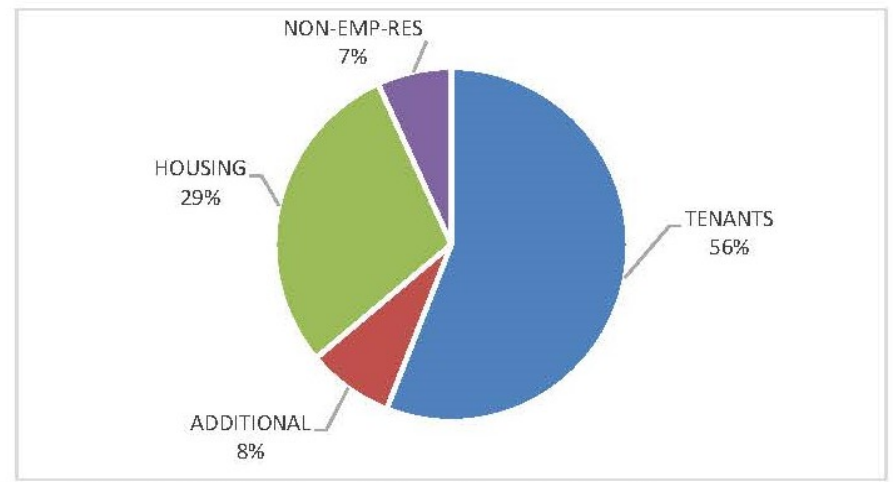


Figure 4.3.1 - 2014-2017 Annual Water Usage by User Group

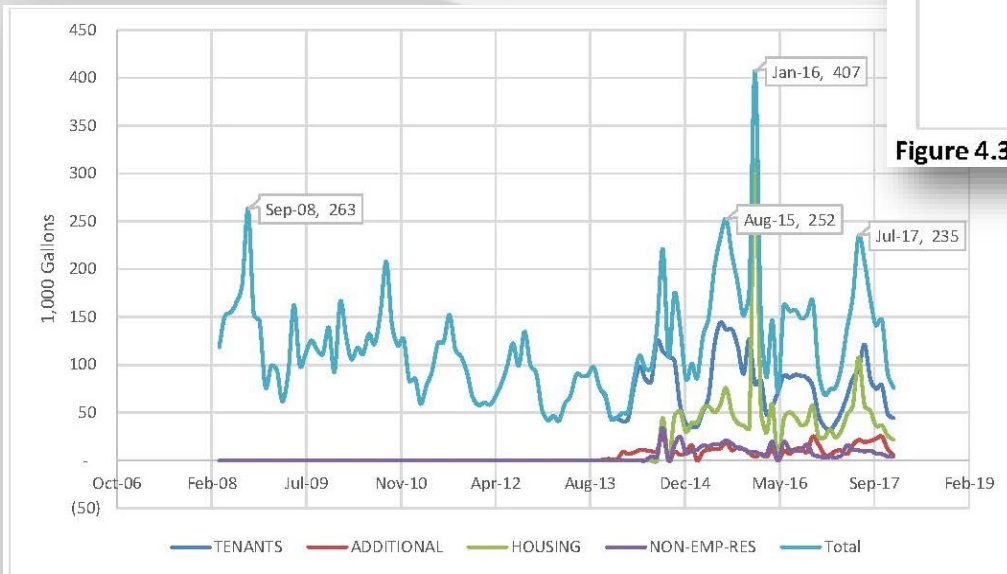


Figure 4.3.2 - Monthly Water Use by User Group



WATER USAGE

- Estimated Annual Usage = 1.5 million gallons per year

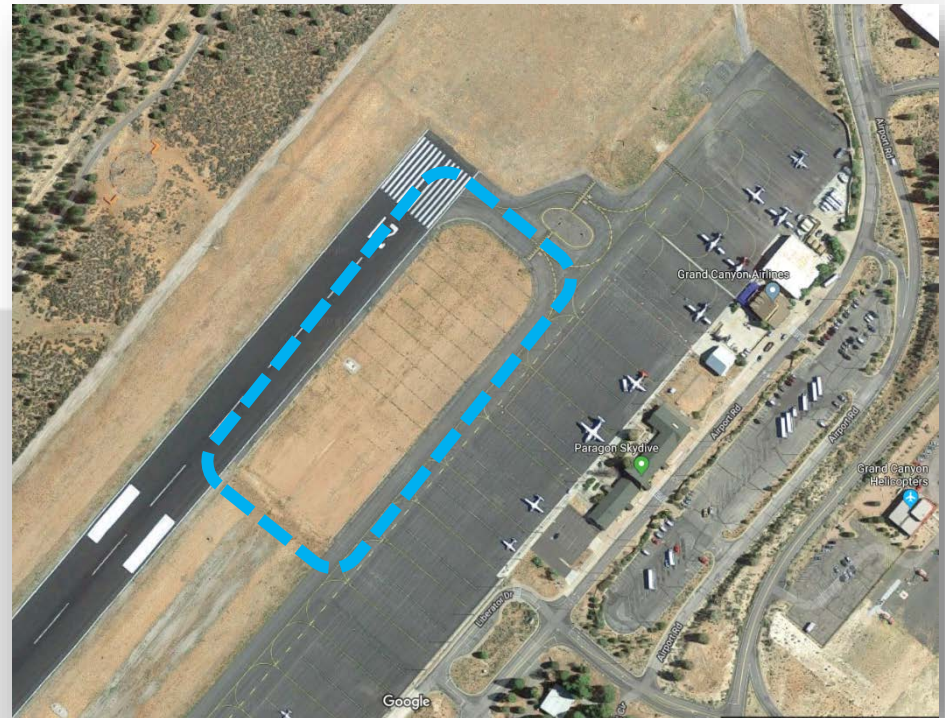


Figure 4.3.5 - Total Annual Water Use



WATER SUPPLY

- Formerly Collected from Infield Catchment Area
- Now Hydro Resources





WATER TREATMENT SYSTEM



- Designed to Treat Surface Water
- Pretreatment using 125,000 gal. Tank, Oil/Water Separator, BTEX Monitoring
- Package Treatment Plant
- Inactive





WATER STORAGE

- 125,000 gal. Presed. Tank - Inactive
- Two 1.4 MG Potable Storage Tanks
- 375,000 gal. Potable U/G Storage Tank
- 30,000 gal. Booster Pump Wet Well





HYDROLOGIC ANALYSIS



- Three Areas of Concern

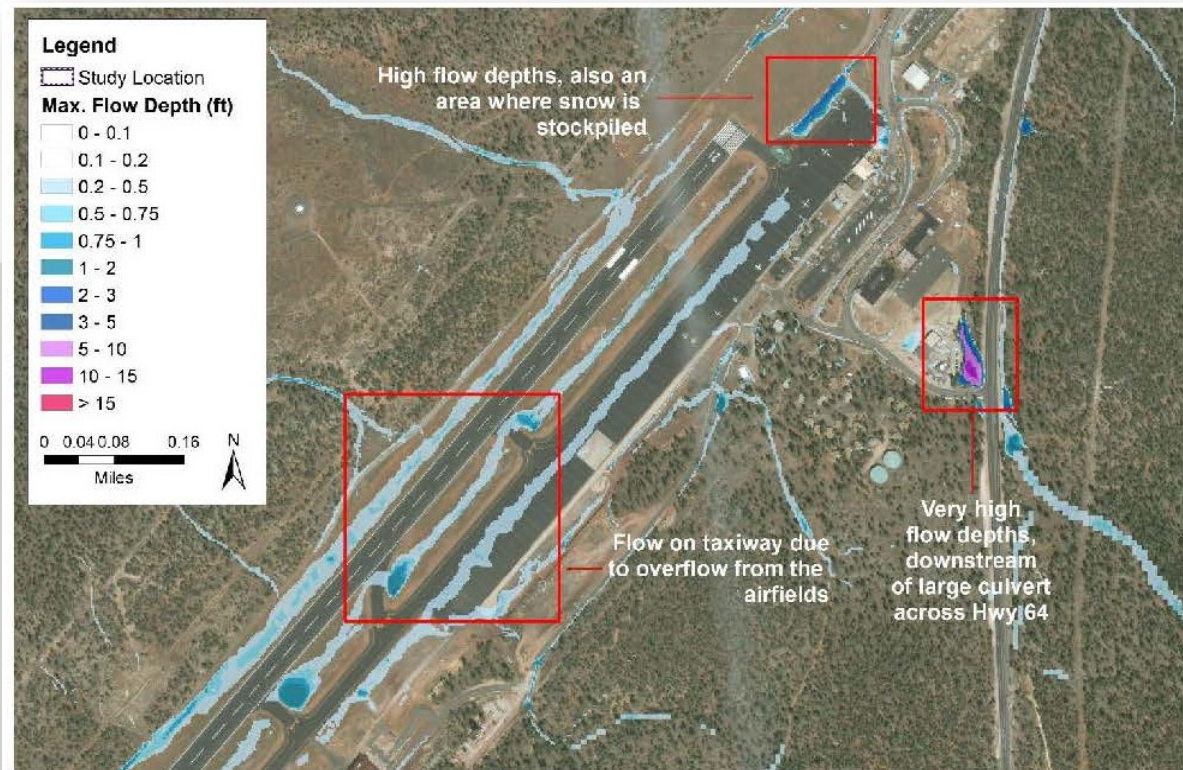


Figure 6.9.1 - Maximum Flow Depth Concern Areas in Airport Domain for 10-year 24-hour Storm Event



INFIELD CULVERTS

- Six Culverts Located in Runway Safety Area

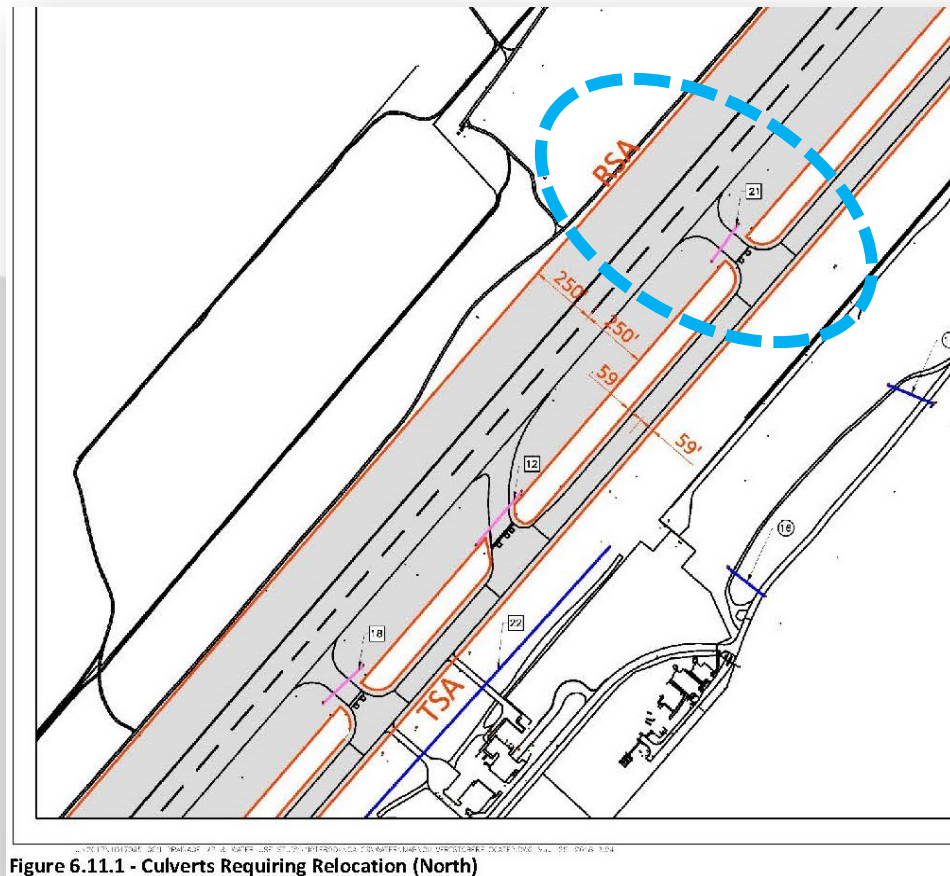
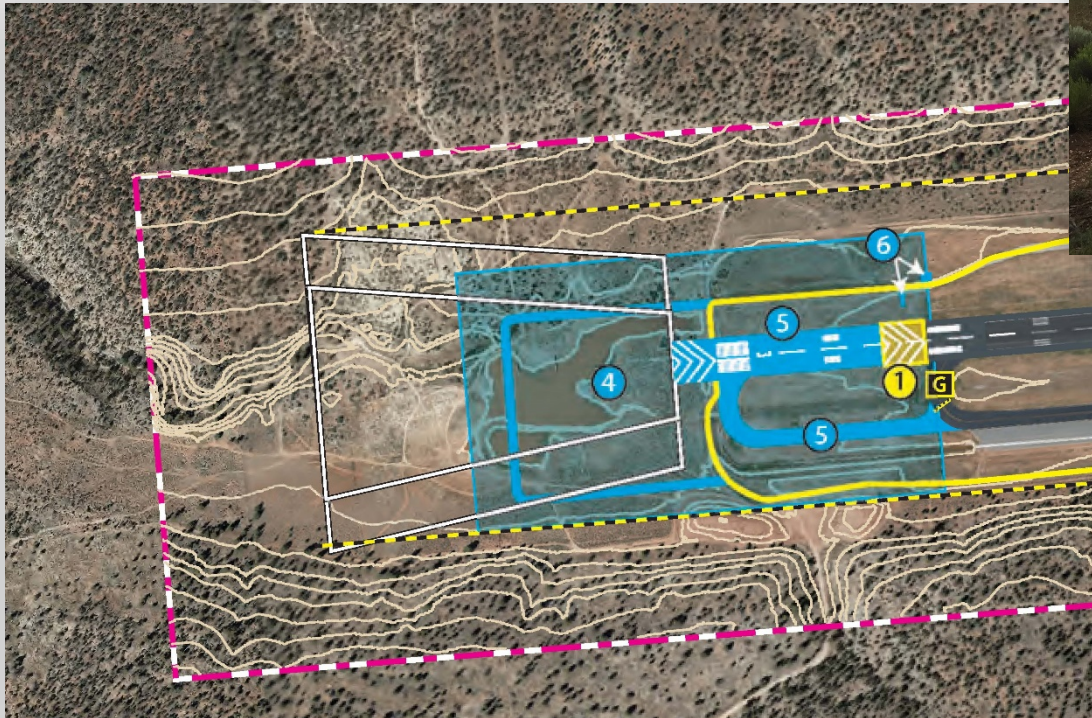


Figure 6.11.1 - Culverts Requiring Relocation (North)



RAIN TANK

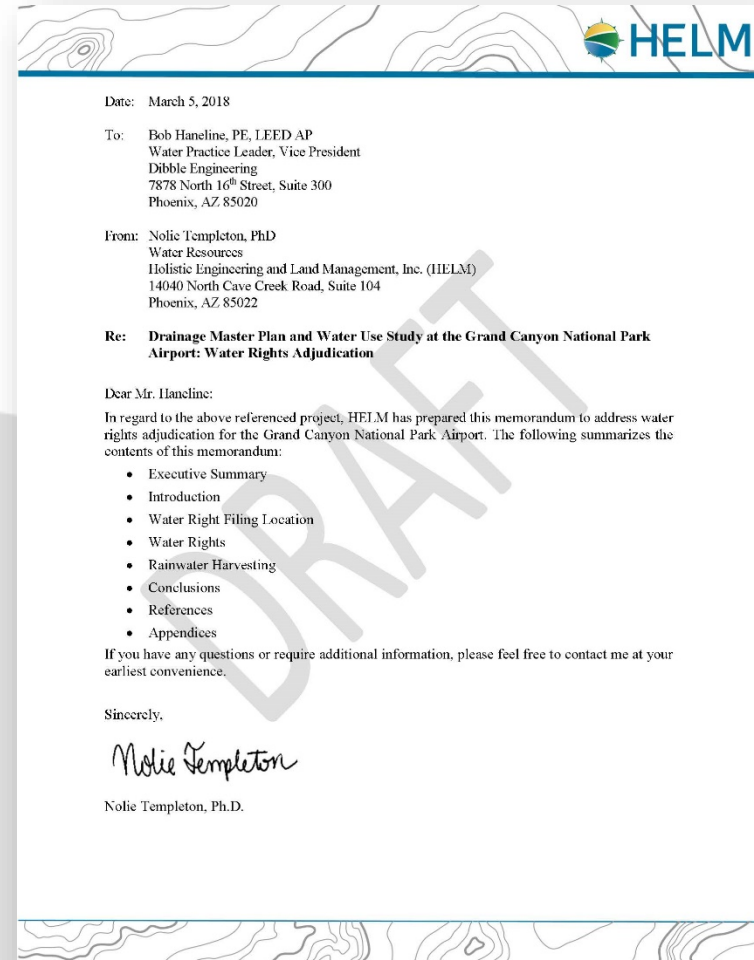
- Runway Extension
- Wildlife Attractant
- National Wetland Inventory





SURFACE WATER RIGHTS

- Adjudication Memo
- ADOT Owns Water Rights for All Surface Water That Flows to Rain Tank.





SURFACE WATER HARVESTING ANALYSIS

- Collect Surface Water Generated Onsite
- 3 Scenarios

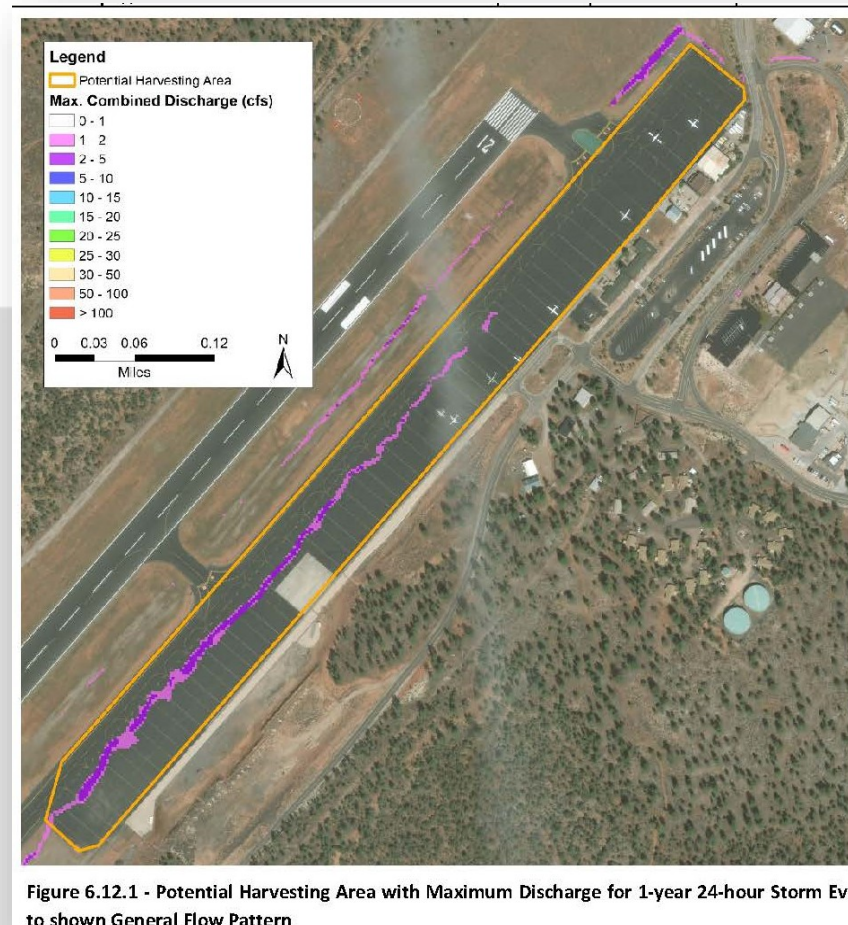


Figure 6.12.1 - Potential Harvesting Area with Maximum Discharge for 1-year 24-hour Storm Event to shown General Flow Pattern



SURFACE WATER HARVESTING ANALYSIS



- Evaluated Historical Rainfall Data
- Discounted Small and Very Large Rain Events

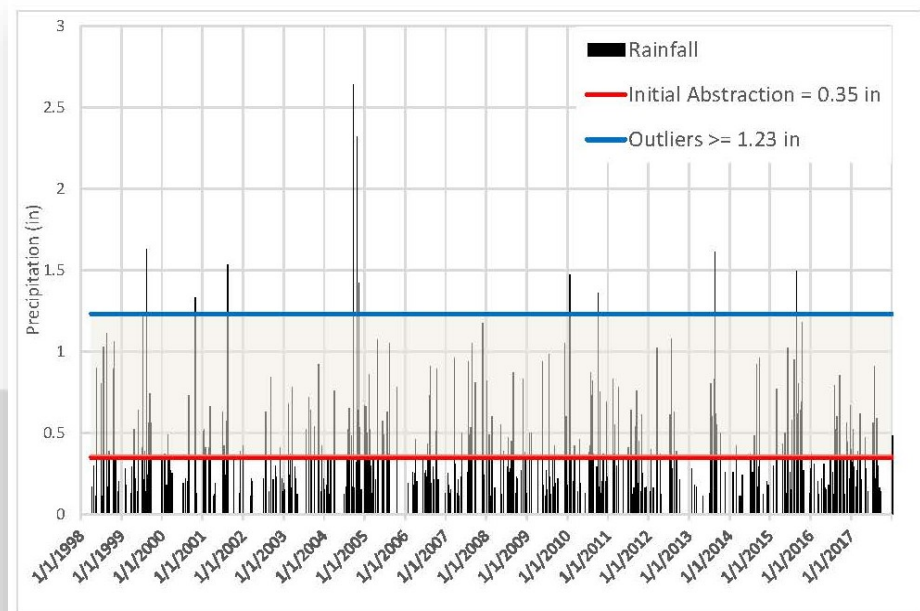


Figure 6.12.2 - Rainfall Events at Grand Canyon National Park Airport (Network: GHCND, Station ID: USW00003195)

Table 6.12.1 – Potential Water Available for Capture at GCN

Capture Scenario	Description	Area (acres)	Annual Water Available for Capture (ac-ft)	Annual Water Available for Capture (gal)
1	Aircraft parking apron only	29.7	35.5	11,567,711
2	All impervious areas within GCN	113.6	135.8	44,250,566
3	Airport model domain includes all land use types	2012.5	462.2	150,608,332



COMMENTS?



NEXT STEPS

