

NM UNIT PROJECT: COMPONENTS & OPTIONS

**A Presentation to
the Gila San Francisco Water Commission**

February 17, 2015

Interstate Stream Commission



NM Unit Project

- The “NM Unit” will be the physical facilities used to develop the AWSA water in Southwest NM.
- Secretary of the Interior is authorized to design, build, operate and maintain the NM Unit.
- Upon request, the Secretary is required to transfer these responsibilities, all or any combination, to “NM CAP Entity”.

Proposed Project Components

- Four Major Components:
 - ▣ Diversion
 - ▣ Conveyance
 - ▣ Storage
 - ▣ Delivery

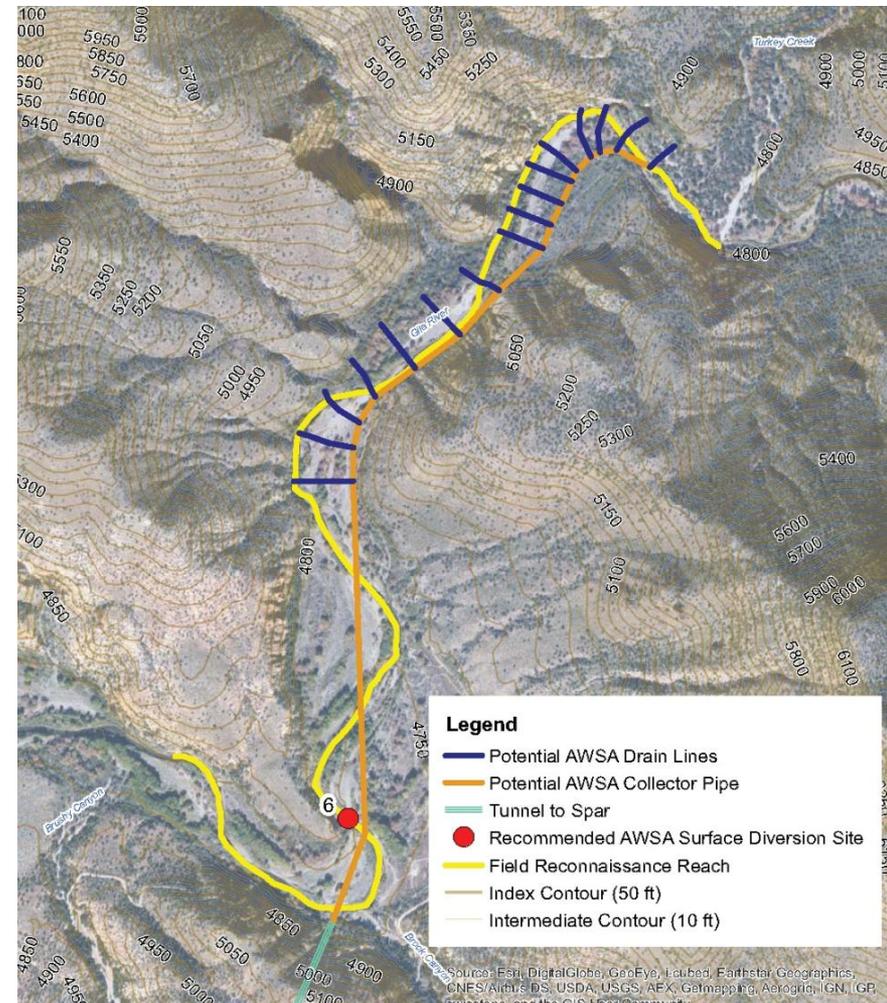
- Outlines of this presentation:
 - ▣ Diversion & Conveyance Methods
 - ▣ Storage Sites & Delivery
 - ▣ Additional Considerations

Diversion & Conveyance Method 1: Diversion + Gravity

- Gain enough head to fill reservoirs by gravity
- Outside Wilderness and Mitigation Areas
- Geomorphologically stable



Location: Between Turkey
Creek and Mogollon Creek



Diversion & Conveyance Method 2: Diversion + Pumping

- Location: Anywhere downstream of Mogollon Creek, in the Cliff-Gila Valley
- Examples:
 - ▣ Bill Evans
 - ▣ Divert & Pump to Spar (BHI's Phase II Alternative 3)

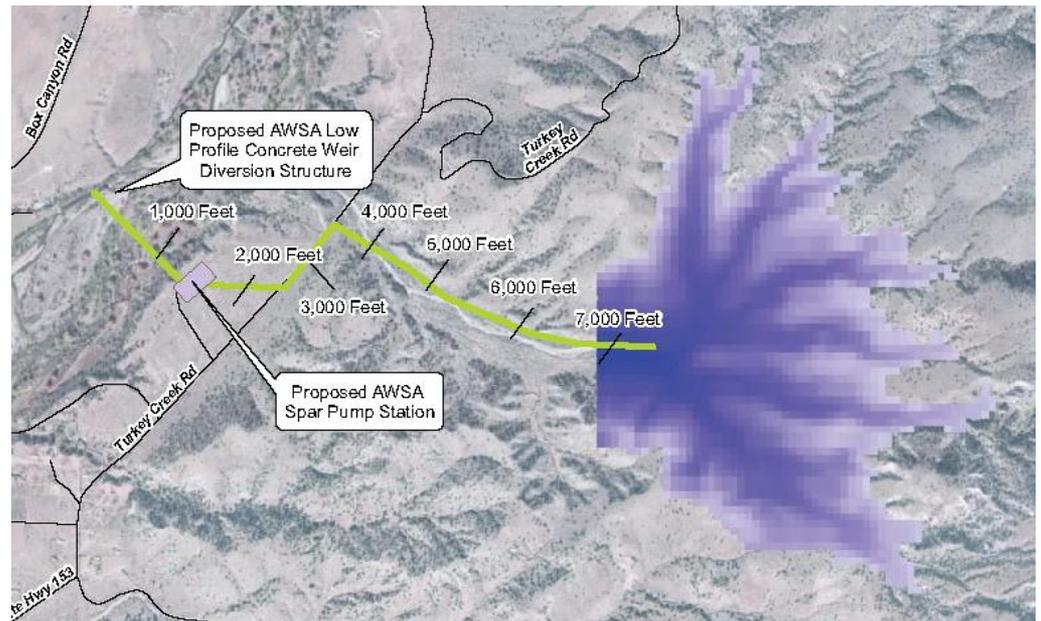
Example 1: Bill Evans

- Concrete diversion dam across floodplain, and sluiceway
- Diverts during low flows
- Operator shuts down the system during floods to avoid turbulent water into pumps and lake



Example 2: Divert & Pump to Spar

- Major Infrastructure to Pump 350 cfs:
 - ▣ Seven pumps:
 - Three large pumps, each 5900 hp (each pumping 90 cfs)
 - Four smaller pumps, each 1500 hp (each pumping 20 cfs)
 - ▣ Four 60" pipelines from pump station to reservoir
 - ▣ PNM substation and power line extension



Example 2: Divert & Pump to Spar

- Pumping Costs (2014 dollars):
 - ▣ Capital: \$74.8M
 - ▣ Electrical: \$4.3M/yr
 - ▣ Other O&M: \$0.4M/yr

- Unit Cost of Electricity: \$715-\$875/AF

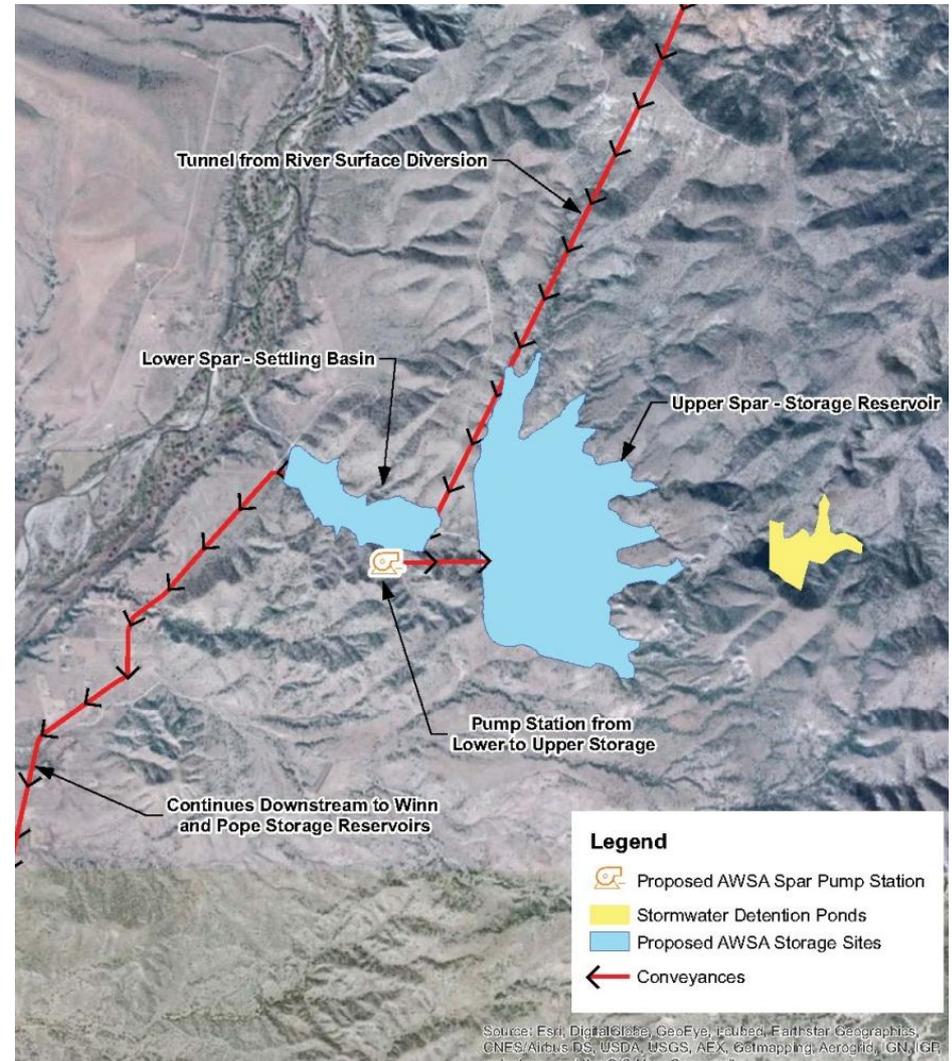
Diversion & Conveyance Method 2: Diversion + Pumping

- Challenges:
 - ▣ Pumping costs
(capital, electrical,
O&M)
 - ▣ Carbon footprint
(CO₂ emissions)



Diversion & Conveyance Method 3: Diversion + Gravity + Pumping

- Reduces high capital and O&M costs of a large pump station



Diversion & Conveyance Method 4: Direct Pumping from the River

- Challenges:
 - ▣ VE Study: “Can't pump the needed volume with the river morphology”
 - ▣ Large inflows that occur within a short period of time
 - ▣ Potential damage to pumps from sediment load
 - ▣ High costs
 - ▣ Carbon footprint
 - ▣ Endangered species



Storage Sites & Delivery

- All proposed sites by BHI & BOR: Small Spar, Large Spar, Winn, Pope, Sycamore, Greenwood
- VE Team: Minimize number of reservoirs
- Target optimal capacity to retain desired safe yield to meet needs in SWNM (Municipal & Industrial, agricultural, environmental uses)
- Safe Yield is the amount of water available in a reservoir for delivery after losses

Additional Consideration 1: AWSA Diversion Constraints

- There are multiple conditions that must be met before NM can divert the AWSA water. Here are the major ones:
 - ▣ Maximum diversion rate of 350 cfs
 - ▣ Minimum monthly flow bypasses
 - ▣ 140,000 AF in any running 10-year period
 - ▣ Maximum diversion of 64,000 AF/yr
 - ▣ San Carlos Reservoir storage
- Secretary of the Interior responsible for CAP Entity's compliance with the AWSA conditions

Additional Consideration 2: Proposed Diversion Structures

- Surface Diversion:
 - ▣ Coanda Screens
 - ▣ Concrete low-head dams across the river not recommended due to environmental impacts
- Subsurface Diversion:
 - ▣ Infiltration Gallery

Plan View: During Low Flows



Perspective View: During Higher Flows



Conclusion

- NM Unit Project not comparable to Bill Evans:
 - ▣ Operation (diverting at high flows)
 - ▣ Environmental Impacts (no dams across the river)
 - ▣ Needs (serve three counties)
- Pumping-only option is challenging due to:
 - ▣ AWSA diversion constraints (volume, timing, etc)
 - ▣ Costs
 - ▣ Carbon footprint
- All options to be further evaluated in a 30% engineering design level

Thank you!

□ Questions?

