NM UNIT PROJECT: COMPONENTS & OPTIONS

A Presentation to the Gila San Francisco Water Commission

February 17, 2015
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”.

NM Unit Project
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 (CO$_2$ 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
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?