New Mexico AWSA Gravity Flow Analysis
July 8, 2016
Bureau of Reclamation, Phoenix, Arizona

Diversion Point Canal Invert Elevation (6ft. higher than river thalwag)*		
Point	**Elevation (Ft)**	**Location**
1	4666	At Stream Guage
5	4626	2270 ft Downstream of Mogollan Creek
6	4617	5100 ft Downstream of Mogollan Creek, 1250 ft upsteam of Existing Upper Gila Diversion
Upper Gila Diversion	4605	Existing Diversion
Ft. West Diversion	4598	Existing Diversion

Tributary Name	Diversion Point	Conveyance Length (FT)	Elevation Loss (FT)	Canal Inlet Invert Elevation	Dam Crest Elevation (FT)	Storage Volume (AC-FT)	Additional Storage Volume above canal invert (AC-FT)**	Dam Length (FT)	Thalweg	Top of Sediment Elevation	Height of Dam	Top of Storage	Surface Area (AC)	Average Volume of Dam (CY)	Diversion Cost	Conveyance Cost (150 CFS)	Dam Cost	Lining Cost	Total Cost
Cliff-Gila Area																			
Storage Facilities on																			
Unnamed Canyon	1	21404	6	4660	4673	**67**	**24**	826	4631	4641	42	4660	5	143209	$12,200,000	$6,850,000	$11,400,000	$741,000	**$31,191,000**
Miller Canyon	1	24361	7	4659	4672	**176**	**50**	1170	4621	4631	51	4659	11	282626	$12,200,000	$7,796,000	$22,400,000	$1,522,000	**$43,918,000**
Doyle Canyon	1	29568	9	4657	4670	**80**	**21**	547	4622	4632	48	4657	5	121020	$12,200,000	$9,462,000	$9,600,000	$644,000	**$31,906,000**
Doyle Canyon(Ring Dam)	1	29568	9	4657	4670	**1097**	**130**	2425	4595	4605	75	4657	29	1856608	$12,200,000	$9,462,000	$146,700,000	$3,971,000	**$172,333,000**
Winn Canyon	1	35393	11	4655	4668	**3032**	**529**	1563	4589	4599	79	4655	117	829028	$12,200,000	$11,326,000	$65,500,000	$16,117,000	**$105,143,000**
Unnamed Canyon	5	9223	3	4623	4636	-		450	4618	4628	18	4623	-	-	-		-	-	-
Miller Canyon	5	11230	3	4623	4636	-		717	4615	4625	21	4623	-	-	-		-	-	-
Doyle Canyon	5	14123	4	4622	4635	-		514	4617	4627	18	4622	-	-	-		-	-	-
Doyle Canyon(Ring Dam)	5	14123	4	4622	4635	**410**	**108**	2428	4592	4602	43	4622	24	768215	$12,200,000	$4,520,000	$60,700,000	$3,308,000	**$80,728,000**
Winn Canyon	5	18974	6	4620	4633	**673**	**187**	930	4583	4593	50	4620	42	221767	$12,200,000	$6,072,000	$17,600,000	$5,708,000	**$41,580,000**
Unnamed Canyon	6	5712	2	4615	4628	-		-	4618	-	-	-	-	-	-		-	-	-
Miller Canyon	6	7850	2	4615	4628	-		-	4615	-	-	-	-	-	-		-	-	-
Doyle Canyon	6	10700	3	4614	4627	-		-	4617	-	-	-	-	-	-		-	-	-
Doyle Canyon(Ring Dam)	6	10700	3	4614	4627	-		-	4592	-	-	-	-	-	-		-	-	-
Winn Canyon	6	15031	5	4612	4625	**390**	**142**	883	4583	4593	42	4612	32	158665	$12,200,000	$4,810,000	$12,600,000	$4,333,000	**$33,943,000**

***Reclamation assumes the invert elevation of the conveyance canals at the intake is 6 feet higher than the river thalwag.**
****"Additional Storage Volume above canal invert" refers to reservoir volume that could potentially be filled by runoff events within side-channel watersheds.**

1. This data was developed to show optimized gravity flow options and to inform the New Mexico CAP Entity and the New Mexico Stream Commission of potential gravity flow storage volumes and associated costs.
2. Three points of diversion were evaluated: the stream gage site; a site 2,300 feet downstream of Mogollon Creek between swaths of National Forest land; and 5,100 feet downstream of Mogollon Creek near the existing Upper Gila Diversion downstream of National Forest land.
3. Elevations at each of the three diversion points are provided, and are roughly 6 feet higher than the river thalweg (low point) to allow for stream flows to be diverted through gated intakes into conveyance canal(s).
4. The elevation of the river at the stream gage site is 4660, the same elevation the ISC and their consultants are using.
5. For the purpose of this analysis, Reclamation assumes a gated diversion structure. The invert of the canal(s) at the intake from the diversion structure is assumed to be 6 feet higher than the thalweg of the river, which may vary depending on actual field conditions and design criteria.
6. The Doyle Canyon ring dam is an alternative that requires a semicircular embankment to be constructed out onto the Gila River floodplain to create a significant portion of the reservoir storage.
7. The table columns highlighted in yellow show potential storage volumes in 5 reservoir locations on the right side of the river, for each of the three diversion points. The column labeled “Additional Storage Volume above Canal Invert” shows the volume of runoff generated within the respective watershed that could be stored in the reservoir before the canal depth is exceeded.
8. The column highlighted in green shows estimated costs of the options. Reservoir lining is included in the total costs.