

**Preliminary Activities, Time Durations, and Potential Focus Areas for Performance Measures for ASR Project Development and Implementation**

Phase	General Description	Task #	Task	Estimated Duration (years)	Potential "Triggers"
1	Higher-Level Feasibility Analyses	1.1	Identify / Select Existing Well(s) for Potential Pilot ASR Testing	0.25	Suitable existing wells in target aquifers for testing cannot be identified
		1.2	Perform Site-Specific Injection Capacity Constraints Analysis for Selected Existing Well	0.25	Results show that desired per-well injection capacity is unrealistic
		1.3	Perform 3-component Geochemical Interaction Modeling	0.25	Results show that undesirable reactions (precipitation and/or dissolution) are likely
		1.4	Develop Pilot ASR Testing Program	0.25	
		1.5	Identify Potential New ASR Well Sites	0.5	Sufficient number of new ASR wells sites cannot be identified
		1.6	Preliminary Groundwater Modeling of ASR Scenarios (parallel to above tasks)	0.5 - 2.0	Results show: - The target aquifers cannot sustain the required injection rates without undesirable results - The target aquifers cannot store the required recharge volumes and durations without excessive losses - The target aquifers cannot sustain the required recovery pumping rates without undesirable results
		Phase 1 Duration Subtotal			
2	Pilot ASR Testing	2.1	Retrofit Existing Well for Pilot ASR Testing (temporary facilities)	0.25	Results show: - Sustainable per-well injection rate is too low - Unacceptable plugging rates are observed - Backflushing cannot fully mitigate plugging and maintain well performance
		2.2	Perform Injection Well Hydraulic Testing	0.25	
		2.3	Develop Multiple ISR Cycle Testing Program (based on results of T 2.2)	0.25	
		2.4	Implement Multiple ISR Cycle Tests	1.0 - 2.0	Results show: - Long-term per-well injection rates are not sustainable - Injection results in unacceptable aquifer water-level response - Stored water-quality exceeds State Standards - Long-term per-well recovery rates are not sustainable - Recovery pumping results in unacceptable offsite impacts to other basin pumpers - Recovered water-quality exceeds State Standards
		2.5	Refined Groundwater Modeling of ASR Scenarios (based on results of T 2.4)	0.5	Results show: - The target aquifers cannot sustain the required injection rates without undesirable results - The target aquifers cannot store the required recharge volumes and durations without excessive losses - The target aquifers cannot sustain the required recovery pumping rates without undesirable results
		2.6	Develop Basis-of-Design for Permanent ASR Well Facilities	0.5	Estimated project costs exceed allowable budget
		Phase 2 Duration Subtotal			
3	Project Implementation	3.1	Procurement of ASR Facilities Properties / ROW	1.0	Sufficient number of ASR well sites (existing or new wells) cannot be acquired Needed Diversion/Treatment/Conveyance improvements prove infeasible
		3.2	Design / Engineer ASR Well Project Facilities (parallel with T 2.1)	1.0	
		3.3	Perform CEQA for Permanent ASR Project	0.5	Potential significant impacts cannot be mitigated
		3.4	ASR Well Drilling and Production Testing	1.5	New well performance is insufficient for project needs
		3.5	Infrastructure Improvements (diversion/treatment/conveyance) parallel with T 3.4	1.5	New facilities unable to deliver sufficient volumes to/from ASR wells
		3.6	Perform ASR Demonstration Testing and Develop Site-Specific Operational Parameters	1.0 - 2.0	Unanticipated well and/or aquifer response (water-levels and/or - quality) is observed
Phase 3 Duration Subtotal				4 - 6	
<b>Total Estimated Duration</b>				<b>6 - 11</b>	