



November 21, 2007  
Project No. 06-0023

Monterey Peninsula Water Management District  
Post Office Box 85  
Monterey, California 93942

Attention: Mr. Joe Oliver, Senior Hydrogeologist

Subject: Proposal for Professional Services; Phase 1 ASR Project, Fiscal Year  
2007-2008 Assistance **DRAFT**

Dear Joe:

In accordance with your request, Pueblo Water Resources, Inc. (PWR) is pleased to present this proposal for hydrogeologic and engineering services for the District's Phase 1 Aquifer Storage and Recovery Project during the remaining period of Fiscal Year 2007-2008 (FY 07-08). Based on our discussions, it is our understanding that work needed includes the following general services: 1) development and implementation of the Water Year 2008 recharge program; 2) engineering and construction management of site facilities; 3) on-going coordination with California American Water (CAW); and, 4) assistance with regulatory permitting for the project. Presented in this proposal is a scope of work, schedule, and costs to assist the District with these aspects of the project.

### **BACKGROUND**

The Phase 1 Aquifer Storage and Recovery (ASR) Project consists of expanding the successful Santa Margarita Test Injection Well No.1 (SMTIW No. 1) project to include the addition of a second well (SMTIW No. 2) and associated facilities in an expanded site area contiguous to the existing SMTIW No.1 site. The overall objective of the Phase 1 ASR Project is to facilitate the conjunctive use of water supplies in the Carmel River System and Seaside Groundwater Basin (SGB) that will benefit the natural resources of the Carmel River and the groundwater resources of the SGB. The project generally involves the diversion of excess winter/spring flows from the Carmel River System for recharge, storage, and subsequent recovery in the SGB. As designed, the Phase 1 ASR Project will be capable of diverting and storing (on average) approximately 920 acre-feet per year.

The drilling and construction of SMTIW No. 2 and a monitoring well (MW-1) at the site have recently been completed. In addition, design, plans and specifications for preliminary site grading and construction of underground utilities at the site have been prepared, and the District has recently received bids from qualified contractors for this work. We understand that the District anticipates that it will be able to obtain water for recharge testing through the CAW distribution



system this winter, beginning as soon as excess Carmel River system water is available, as per SWRCB permit allowance. The District therefore desires to amend PWR's existing contract to provide construction management for the upcoming site facilities work to intertie the new well, and to assist with the development and implementation of the test program for the Water Year 2008 (WY2008) recharge season.

It is important to note that our proposed scope of services is intended to address project needs for the remainder of the District's 2007-2008 fiscal year (i.e., through June 2008). Prior to the beginning of the next fiscal cycle (i.e., July 2008), another proposal will be provided to address the anticipated project needs during the 2008-2009 fiscal year.

### **PURPOSE AND SCOPE**

Due to extremely dry conditions during WY2007, no recharge testing has been conducted at the new SMTIW No.2 since its construction. The primary purpose of the testing during WY2008, therefore, is to evaluate the performance of the new SMTIW No. 2, operating both by itself and during simultaneous dual-well operation with the SMTIW No. 1. The purpose of the testing can be further categorized into issues generally associated with: 1) injection well hydraulics and performance; 2) aquifer response to dual-well injection; and 3) water quality issues associated with geochemical interaction and mixing of injected and native ground waters. Details of each of these general categories are presented below:

Injection Well Hydraulics. Issues associated with the hydraulics and performance of the injection well deal primarily with determining the optimal operational and maintenance characteristics of SMTIW No. 2 itself. Primary issues to be investigated include:

- Determination of injection well efficiency and specific capacity;
- Evaluation of injection well plugging rates;
- Determination of optimal rates, frequency, and duration of backflushing in order to maintain long-term injection capacity;
- Determination of long-term sustainable injection rates, and;
- Determination of mutual well interference effects between the two ASR wells.

Aquifer Response. Issues associated with the response of the aquifer system to injection are of importance for evaluating the feasibility of expanding the ASR program with additional well facilities in the SGB. While previous testing of SMTIW No. 1 has included investigation of the aquifer response to injection, it is important to quantify the aquifer response to the increase (up to 150 percent greater) in overall injection capacity at the site gained through the installation of SMTIW No. 2.



Water Quality. Issues related to water quality are important because both intermixing with native groundwater and geochemical interaction with aquifer minerals can affect the potability of the recovered water and the plugging rate of the injection well(s). Important water quality data needs include the following:

- Monitoring of injectate water quality versus plugging rates;
- Identification of water quality changes during subsurface storage associated with mixing and geochemical interactions; particularly the fate of Disinfection Byproducts (DBPs), and;
- Tracking of water quality improvement over successive injection/storage/recovery (ISR) cycles.

In addition to the above recharge testing program needs, the purpose of the FY 07-08 work will include the provision of engineering and construction management services, regulatory permitting assistance, and summary reporting.

### **Scope of Services**

Based on our understanding of the District's needs, and our experience with SMTIW No. 1 and similar ASR projects, we have prepared the following scope of services to assist the District during the remainder of FY 07-08.

**Task 1 – Project Management and Meetings.** This task includes the development of the WY2008 recharge test program, attendance at various meetings during the course of the project, and overall project management. PWR will review existing conditions at the site and meet with District staff to discuss test program goals and scheduling. PWR will provide the following services associated with program development:

- Conduct project kickoff meeting(s) with the District and CAW;
- Develop hydrogeologic and water quality test program and data needs for recharge operations during WY2008;
- Develop analytic laboratory testing schedule.

In addition, it is anticipated that on-going "ASR Coordination" meetings between the District and CAW will continue during the FY 07-08 period. For budgetary purposes, it is assumed that meetings will be held on a monthly basis and will be attended by a PWR Principal Engineer and/or Hydrogeologist, depending on meeting agenda and project needs. It is also assumed that about half of these meetings will be attended via conference call.

**Task 2 - Test Program Implementation and Assistance.** PWR will assist District staff with the implementation of the WY2008 recharge test program. PWR assistance is envisioned to include the following:

- Supervision of each recharge test phase initiation;



- Periodic field observation of critical phases of the test program;
- Training of District staff in operation of test facilities, and provision of test logs and procedures to District staff.

This task assumes that PWR will be supported by District staff in the ongoing operation, data collection, and water sampling for the test program. In addition to the above specific subtasks, we have included in our budget estimate the provision of on-going assistance to be provided on an as-needed/requested basis to address critical project needs as they arise. For budgetary purposes, we have assumed this will involve one two-day field visit per month during the recharge season.

**Task 3 - Water Quality Assessment.** PWR will also assist the District with implementation of the on-going water quality data collection program, which is to include the monitoring of the new SMTIW No. 2 and MW-1, as well as the existing SMTIW No. 1.

Specific water quality testing and analyses to be performed in this task include the following:

- Assistance with routine monitoring and tracking of field water quality parameters during injection and storage;
- Bi-Weekly sampling and analysis of DBPs and chloride ion to assess DBP formation/degradation and mixing of the injectate and native groundwater in the subsurface;
- Monthly sampling and analysis of the full suite of general mineral, general physical, organic carbon, iron-dissimilatory bacteria, and other constituents necessary for characterization and geochemical interaction assessment of injectate and stored/backflushed waters to supplement field water quality and DBP data.

It is anticipated that PWR will retain laboratory services with Monterey Bay Analytical Services, located near the District's office in Ryan Ranch. It is assumed that District staff will assist with the grab sampling at the wells and delivery of samples to the laboratory. It is also assumed that any sampling and analysis of offsite wells in the SGB (e.g., that may be required by RWQCB) will be provided by the District or CAW.

**Task 4 - Engineering and Construction Management.** In order to ready the Phase 1 ASR facility for recharge testing operations in WY2008, several engineering and construction management tasks must be implemented, as presented below:

**Task 4.1 - Construction Management for Underground Facilities.** In order to put SMTIW No. 2 into "early" operational service prior to construction of permanent chemical/electrical/mechanical facilities (i.e., the aboveground facilities), the



underground piping and infrastructure to intertie the new well to existing SMTIW facilities have been designed, and plans and specifications prepared. This task includes the provision of construction management services to oversee the construction of these interim facilities. Services for this task will include up to 10 hours per week of field engineering and construction observation assistance during the anticipated 8-week construction period, and attendance at a preconstruction meeting with the project contractor.

Task 4.2 – Engineering and Coordination of Temporary Intertie to MCWD.

Recent meetings with CAW have indicated that deliveries of potable water to the SMTIW facility at rates high enough to operate both wells simultaneously for injection will likely not be available until 2010. Design of remaining SMTIW facilities, however, will require at least temporary short-term (1 to 2 weeks) hydraulic testing of both wells simultaneously. To accomplish this testing, the “shortfall” of water supply from the CAW system has been proposed to be made available from the Marina Coast Water District (MCWD) system, which has existing potable distribution system infrastructure within approximately 300 feet of the SMTIW site.

The scope of work for this task is to provide engineering assistance to the District in developing the engineering analysis and physical requirements to implement such an intertie. Work will include the following items:

- Identify the location and condition of proximate MCWD lines;
- Estimate the adequacy/delivery capacity of the MCWD system in this location;
- Identify and resolve engineering issues related to the intertie, including system hydraulics (pressures), piping configuration, backflow prevention, and associated factors;
- Based on existing water quality data, perform geochemical stability and mixing analyses to quantify possible adverse water quality interactions to ensure that use of MCWD water will not result in dissolution or precipitation problems in the well or aquifer systems;
- Meet with MCWD staff to discuss and resolve any logistical issues related to the intertie;
- Prepare a Technical Memorandum summarizing the findings and recommendations of this task.

It is assumed that actual construction of the temporary intertie will be performed by the MCWD, CAW, or contractors retained by the District.



Task 4.3 – Temporary Piping, Valving, and Instrumentation. In order to activate SMTIW No. 2 for testing this recharge season, several additional work items must be implemented, including the following:

- Provision of temporary electrical generator, switchgear, and cabling to power the new SMTIW No. 2 well pump (note: alternatively, the generator could be provided by the District or CAW);
- Provision of temporary piping, valving, and instrumentation to connect the well to the new underground piping and infrastructure installed as part of Task 4.1 above;
- Provision of engineering and field coordination of the electrical and piping work described above.

Work for this task includes the above items, plus contractor/supplier costs for rental of the necessary equipment to render SMTIW No. 2 operable. The budget for this task is based on the following assumptions:

- Duration of temporary testing operation is 6 weeks;
- Both the electrical and piping/valving equipment will be rented;
- Well pump operation will not exceed 100 hours per month during the test period.

Task 4.4 – Completion of Well Head and Pump Assembly for MW-1. Construction of MW-1 was completed in 2007 as part of the SMTIW No. 2 construction project. To utilize the monitoring well for water quality sampling during this year's ASR program, the well will need to be outfitted with a permanent sample pump and mechanical winch assembly to facilitate depth-specific sampling. Instead of providing a dedicated sampling installation, discussions with District staff identified the benefits of a portable winch assembly which can be used at other current/future monitoring well sites for the same purpose. This task includes the following items:

- Development of specifications for the MW-1 wellhead, pump, and depth-specific sampling assembly;
- Purchase of necessary equipment for MW-1;
- Assist District staff with the initial installation and startup of the system.

For completion of this task, it is assumed that a District-supplied electrician will make the final connection of power from the existing MCC to the MW-1 well head, including wire and circuit-breaker installation to the MCC.

Task 4.5 – Engineering/Design Coordination for Final Permanent Facilities. Although design of the permanent utilities and underground facilities for the Phase 1 ASR site facility is complete, the design of the above ground facilities, including



electrical switchgear, instrumentation, disinfection station, Chemical and Electrical Building, and above ground piping, have not been designed due to a variety of unresolved issues with the CAW system and Coastal Water Project (CWP) planning. These unresolved issues will require engineering analysis and coordination with CAW and their CWP consultant to advance a Phase 1 ASR Project facility design that is compatible with the regional water system.

This task includes the on-going coordination with CAW system upgrade work and CWP planning design, with tasks envisioned as follows:

- Meetings with District, CAW, and CWP staff to coordinate design and resolve system integration issues;
- Advance electrical, civil, and mechanical design work as necessary to resolve system integration and/or permit acquisition issues;
- Develop technical memorandum or provide engineering analyses to keep long-lead-time issues such as PG&E service and FORA/BRAC requirements moving forward.

**Task 5 – RWQCB Permitting Assistance.** This task includes assisting the District in obtaining permits and/or cooperation with the Central Coast Regional Water Quality Control Board (RWQCB). Currently, there are no RWQCB permitting requirements that have been established for ASR projects in the region, as the injection of potable drinking water has not been considered a discharge of “waste” and, therefore, does not pose a threat to basin water quality that would require monitoring or regulation beyond California Department of Public Health (CDPH) requirements for potable water. Accordingly, RWQCB permitting of the project under their Waste Discharge Requirements (WDRs) program is not applicable (in fact, RWQCB issued a Waiver to the District for such requirements in July 2007). However, the RWQCB has recently notified the District and CAW that they are now concerned about ASR on the Monterey Peninsula. Their stated concerns relate to the presence of free chlorine and DBPs in the injected water. At this time, it is unclear whether the RWQCB will attempt to impose WDRs on ASR, or whether past and current practice will continue.

Given its evolving nature, it is anticipated that the District will need assistance from PWR in dealing with the RWQCB on this issue. This will likely include attendance at various meetings, preparation of technical memoranda, etc., in support of these efforts. For budgetary purposes, we have included 50 and 40 hours of Principal Engineer and Senior Hydrogeologist time, respectively, for this task.

**Task 6 – Summary Technical Memorandum.** This task includes the preparation of a brief technical memorandum, summarizing the recharge operations and the water quality and level data collected during the WY2008 recharge season.



Since the FY 07-08 period will end before the storage and recovery operations have been performed, it is anticipated that detailed analysis of the complete injection/storage/recovery (ISR) cycle will be included as part of the subsequent FY 08-09 scope of work.

### **Services Not Included**

Completion of the WY2008 test program may require the services of other entities as well as additional costs or fees, which are not included in our scope of services. These items are assumed to be provided by District staff, contractors retained by the District, CAW, or others. Work items that are not a part of our services include the following:

- Data-loggers and transducers for the Phase 1 ASR Project wells and other existing SGB monitoring wells (assumed District provided);
- PG&E application or processing fees for initiation of upgraded electrical service for SMTIW No. 2;
- Water quality sampling and analysis of any offsite wells (assumed CAW provided);
- Construction of the MCWD intertie facilities;
- Electrical connection of MW-1 sample pump to the MCC;
- Permit fees (if any);
- Cost of water, electricity (except the SMTIW No. 2 temporary generator), or other utilities;
- Any others items not specifically included in PWR's scope of services.

### **Schedule**

Our proposed scope of services addresses the anticipated project needs during the remainder of FY 07-08. It is anticipated that the WY2008 recharge season will begin as early as January 2008 and extend through May 2008 (i.e. 5 months). The Task 6 summary technical memorandum will likely be prepared in late May/early June 2008. The WY2008 storage period will begin as late as June 2008 (or earlier, depending on hydrologic conditions), with recovery operations beginning sometime in the late summer or early fall of 2008; therefore, another proposal will be provided in late May 2008 to address the remainder of the WY2008 ISR cycle and other project needs during the 08-09 fiscal year.

### **ESTIMATE OF COSTS**

PWR's estimated costs for services related to the FY 07-08 program were developed based on the proposed scope of work, our experience with similar projects, and our 2007 Fee Schedule (attached). The estimated labor costs for the





major tasks, and the costs for the equipment, outside services, and other direct costs that will be required for completion of the project are fully itemized in the attached spreadsheet, with overall task budget subtotals summarized in the table below:

**Phase 1 ASR Project, FY 07-08 Program  
 Estimated Costs**

<b>Task No./Description</b>	<b>Estimated Cost</b>
1 – Project Management and Meetings	\$14,050
2 – Test Program Implementation and Assistance	\$22,450
3 – Water Quality Assessment	\$6,570
4 – Engineering and Construction Management	\$40,650
5 – RWQCB Permitting Assistance	\$13,100
6 – Summary Reporting	\$6,660
Other Direct Costs	\$7,875
<b>Subtotal</b>	<b>\$111,355</b>
Outside Services	\$70,840
Project Contingency (10%)	\$18,220
<b>Total Estimated Cost</b>	<b>\$200,415</b>

As shown in the above table, the estimated labor and other direct costs for FY 07-18 totals \$111,355, not including outside services and project contingency. The total cost estimate for PWR’s services shown in the table above is \$200,415, which includes outside services and a ten percent contingency in accordance with previous District projects; we recommend that the project contingency be held for authorization by District staff upon written notice and justification by PWR. A detailed breakdown of PWR’s estimated costs showing the various labor rates and assumed hours for the services proposed, outside services, and other direct costs is provided on the attached spreadsheet.

Special Note: As shown above and on the attached spreadsheet, a significant portion (approximately \$71K) of the total estimated costs involve the provision of outside services. For example, the estimated costs associated with providing a temporary electric generator to operate the SMTIW No. 2 pump total



approximately \$25K. Similarly, outside laboratory fees total approximately \$14K (not including the highly specialized iron dissimilatory bacteria testing). Should the District or CAW be able to provide any of the required outside services for the project, such as the examples cited above, our costs would be commensurately reduced.

We understand that in order to authorize this work, your Board must first approve a formal contract amendment. Based on our current workload, we believe that we can commence work within 7 days of your authorization.

We appreciate the opportunity to provide continued assist the District on this important project, and look forward to a timely and successful completion of the work. As always, please do not hesitate to contact us if you have any questions or require any additional information.

Sincerely,  
Pueblo Water Resources, Inc.

Robert C. Marks, P.G., C.Hg.  
Principal Hydrogeologist

Stephen P. Tanner, P.E.  
Principal Engineer

RCM.SPT

Attachments: 2007 Fee Schedule  
Cost Estimation Spreadsheet



**PUEBLO WATER RESOURCES, INC  
2007 FEE SCHEDULE**

***Professional Services***

Principal Professional.....	\$150/hr
Senior Professional.....	\$130/hr
Project Professional.....	\$120/hr
Staff Professional.....	\$ 95/hr
Technician.....	\$ 85/hr
Drafting.....	\$ 55/hr
Word Processing.....	\$ 50/hr

***Other Direct Charges***

Subcontracted Services.....	Cost Plus 15%
Outside Reproduction.....	Cost Plus 15%
Travel, Subsistence and Expenses.....	Cost Plus 15%
Vehicle.....	\$ 75/day

**MONTEREY PENINSULA WATER MANAGEMENT DISTRICT**  
**Professional Services for Phase 1 ASR Project**

Fiscal Year 2007-2008  
 Pueblo Project No.: 06-0023



**ESTIMATED FEE SUMMARY**

Task No.	Task Description	Hourly Fee						Hours by Task	Estimated Task Cost
		Principal Professional	Senior Professional	Project Professional	Staff Professional	Technician	WP		
1	Project Management and Meetings	40	60				5		\$14,050
2	Test Program Implementation and Assistance	25	70	80					\$22,450
3	Water Quality Assessment	15	24	10					\$6,570
4	Engineering and Construction Management	115	100	80			10		\$40,650
5	RWQCB Permitting Assistance	50	40				8		\$13,100
6	Summary Technical Memorandum	8	24	16			4		\$6,660
<b>Hours by Labor Category:</b>		253	318	186	0	0	22	14	
<b>Costs by Labor Category:</b>		\$37,950	\$41,340	\$22,320	\$0	\$0	\$1,100	\$770	
								<b>Total Labor Hours:</b>	793
								<b>Total Labor Costs:</b>	\$103,480

**OTHER DIRECT COSTS (ODC's)**

	Units	Unit Price	No. of Units	Fee
Vehicle	Daily	\$75	35	\$2,625
Travel and Lodging	Daily	\$150	35	\$5,250
<b>Subtotal ODCs:</b>				<b>\$7,875</b>

**OUTSIDE SERVICES**

	Units	Unit Price	No. of Units	Fee
Water Quality Laboratory (MBAS Monthly Suite)	Lump Sum	\$560	10	\$5,600
Water Quality Laboratory (MBAS Bi-Weekly Suite)	Lump Sum	\$320	20	\$6,400
Water Quality Laboratory (Fe Dissimilatory Bacterial)	Lump Sum	\$1,000	10	\$10,000
Electric Generator Rental (optional)	Weekly	\$3,700	6	\$22,200
MW-1 Sampling Pump Assembly	Lump Sum	\$15,000	1	\$15,000
Temporary Piping Rental	Weekly	\$400	6	\$2,400
<b>Subtotal Outside Services:</b>				<b>\$61,600</b>
<b>Subtotal Outside Services w/ Markup (15%):</b>				<b>\$70,840</b>

**COST SUMMARY**

Labor	\$103,480
Other Direct Costs	\$7,875
Outside Services	\$70,840
10 % Contingency	\$18,220
<b>TOTAL ESTIMATED PROJECT COST:</b>	<b>\$200,415</b>