



October 12, 2010
Project No. 06-0027

Monterey Peninsula Water Management District
5 Harris Court, Building G
Monterey, California 93942

Attention: Mr. Joe Oliver, Water Resources Manager

Subject: Proposal for Hydrogeologic and Engineering Services: Phase 1 and 2 ASR Projects,
Fiscal Year 2010-2011 Program

Dear Mr. Oliver:

In accordance with your request, Pueblo Water Resources, Inc. (PWR) is pleased to submit this proposal for ongoing hydrogeologic and engineering services for the Monterey Peninsula Water Management District (MPWMD or District) Aquifer Storage and Recovery program. Presented in this proposal are a detailed scope of work, schedule, and estimated costs to assist the District with various ASR-related tasks during the remaining period of Fiscal Year 2010-2011 (FY 2010-2011). It should be noted that this proposal is not for new projects, but rather is to complete the work that has been deferred due to District budget cycle and external funding issues. PWR's authorization to perform this work is necessary to maintain existing program direction and to avoid the additional costs and delays associated with re-starting the program.

BACKGROUND

Aquifer Storage and Recovery (ASR) on the Monterey Peninsula involves the diversion of excess flows from the Carmel River system for recharge, storage, and subsequent recovery in the Seaside Groundwater Basin (SGB). The overall objective of the ASR program is to enhance the conjunctive use of water supplies in both the Carmel River and SGB systems. ASR has been pursued by the District since 1996 as a means to augment water supplies on the Peninsula. The District is currently completing an initial phase of the ASR project (Phase 1) and is in the process of developing an expanded ASR project (Phase 2), in cooperation with California American Water (Cal-Am or CAW), based on the success of the Phase 1 program. During Water Year (WY) 2010, the two Phase 1 ASR wells were operated simultaneously for the entire injection season. A total of approximately 1,111 acre-feet (AF) of excess Carmel River system water (treated to Drinking Water Standards) was injected into the SGB, exceeding the projected overall average yield of 920 AFY.

Phase 1. The Phase 1 ASR Project consists of two ASR wells (Santa Margarita ASR-1 and ASR-2) and associated facilities at the so-called Santa Margarita site. The Santa Margarita



ASR-1 and -2 wells were drilled in 2001 and 2007, respectively, and both are screened solely in the Santa Margarita Sandstone aquifer of the SGB.

Although the Phase 1 ASR wells themselves are operational, some of the Santa Margarita site facilities remain to be completed during FY 2010-2011, while additional facilities have been identified for installation at the site to accommodate CAW Coastal Water Project (CWP) operations. Facility items yet to be completed include the following:

- Completion of the Chemical / Electrical Building construction;
- Installation of permanent, full-sized electrical control equipment (VFD, switchgear, etc.);
- Permanent wellhead piping and automation controls;
- Addition of a 40 foot wide pipeline corridor to accommodate new CWP pipelines;
- Redesign of site driveway, hypochlorite loading dock, and proximate grading to accommodate the above-noted CWP lines, and;
- Final site grading, paving, landscaping and fencing, compatible with above additions.

These final facilities and additional site area improvements will allow the facility to be operated at full design capacity (3,000 gpm injection and 5,000 gpm production), and will be compatible with CAW CWP facilities when they are constructed.

The Santa Margarita ASR-2 well is also planned to undergo formal downhole rehabilitation during the fall of 2010. As documented in the WY2009 Summary of Operations Report, ASR-2 experienced a significant decline in performance as a result of residual plugging from testing performed utilizing temporary source water from Marina Coast Water District. Well plugging has reduced the current injection and extraction capacity of ASR-2, and if not mitigated, could also reduce the well's useful service.

It is planned to implement a rehabilitation program at Santa Margarita ASR-2 that is similar to that successfully performed at the site ASR-1 well in 2007. Rehabilitation of Santa Margarita ASR-2 is planned to be performed utilizing the same well contractor (Zim Industries, Inc.) that performed the successful rehabilitation of the site ASR-1 well in 2007. The District recently received a quote from Zim to perform this work and it is anticipated that the District will issue Zim a change order to perform the work under the existing contract with the District for the drilling of the Seaside Middle School ASR Test Well (SMSTW, discussed below).

Phase 2. The Phase 2 ASR Project represents an expansion of the successful Phase 1 ASR Project. The Phase 2 Project is currently planned to consist of two ASR wells and associated facilities, located on an unused portion of the Seaside Middle School (formerly Fitch Middle School), approximately 1,400 feet north of the Santa Margarita site. The so-called Seaside Middle School ASR Test Well (SMSTW) was drilled during the summer of 2010, and is currently undergoing development and production testing. The SMSTW is also screened solely



in the Santa Margarita Sandstone aquifer. The purpose of the SMSTW is to determine the well production characteristics and aquifer parameters of the Santa Margarita Sandstone aquifer underlying the site. Should the testing results prove favorable (as is anticipated), the SMSTW would be converted into a full-scale ASR well (i.e. Seaside Middle School ASR-1), and the site would be improved to include permanent facilities such as permanent pump, piping and automated controls; a backwash pit, and permanent PG&E electrical service and switchgear. Engineered site access via General Jim Moore Blvd would also be included in the facility design.

In order to ready the SMSTW for temporary injection test operations during the WY 2011 recharge season, the following items will need to be implemented:

- Install well pump (either relocate the 400 Hp pump and FCV currently installed at Santa Margarita ASR-1 or obtain rental pump);
- Install temporary piping, meters, valves, instrumentation, etc. at the well (either new temporary equipment or relocated equipment from Santa Margarita ASR-1);
- Modify / improve backflush water disposal piping and percolation field;
- Obtain / install temporary electrical generator and motor switchgear to operate well pump for backflushing operations, and;
- Install temporary fencing / site security for temporary test facilities.

PURPOSE AND SCOPE

We understand that the District anticipates that it will be able to obtain water for recharge operations from the CAW system during WY 2011 as soon as excess Carmel River system water is available per State Water Resources Control Board (SWRCB) water rights permit allowance. The purpose of the proposed work is to: (a) assist the District with completing the remaining Phase 1 project facilities, (b) implement initial well and site improvements at the Phase 2 site, and (c) assist District staff with injection operations at *all three* ASR wells during the upcoming WY 2011 recharge season. Services to be provided during the remainder of FY 2010-2011 (i.e., through June 30, 2011) are related to the following aspects of the ASR program:

Phase 1 ASR Project

- Completion of the remaining Phase 1 ASR Santa Margarita site facilities;
- Preparation of the WY 2010 Summary of Operations Report;
- Implementation of formal downhole rehabilitation of the Santa Margarita ASR-2 well;
- Provision of WY 2011 ASR operations support, and;



- Coordination with CAW regarding site facilities completion, and incorporation of related CAW infrastructure into facilities design.

Phase 2 ASR Project

- Design and installation of temporary well and site improvements required for injection operations at SMSTW;
- Performance of baseline injection testing of SMSTW, and;
- Coordination with CAW for site facilities design, and incorporation of related CAW infrastructure into the facilities.

Miscellaneous ASR Issues

- Coordination with CAW engineering and operations staff regarding general ASR operations and water supply issues.
- Coordination with CAW regarding incorporation of Coastal Water Project (and other CAW ASR projects) into the MPWMD facilities and ASR program.

Scope of Services

Based on our understanding of the District's needs and our experience with this and other ASR projects, we propose to provide the following hydrogeologic and engineering services during the remainder of FY 2010-2011.

Task 1 – Phase 1 ASR Project

Task 1.1 – Santa Margarita Site Engineering and Construction Management. This task includes engineering and construction management services for the completion of the Santa Margarita ASR site facilities which have either not been finalized or require redesign to accommodate recent design decisions from CAW ASR projects, including Coastal Water Project and (C & D Order) "Small Projects" which are now proposed to be integrated to the existing Santa Margarita ASR Facility. Specific work items in this task include the following:

- Design engineering to bring three 16" and two 30" lines into the site for processing (i.e., disinfection and/or disposal), including an additional 40' wide strip easement from the City of Seaside;
- Permitting assistance for acquisition of new land area and permit compliance coordination for ongoing construction work;
- Contract finalization, bidding, and award of work for primary electrical equipment, electrical facilities installation, permanent piping and instrumentation, and final site grading, paving, and fencing;
- Construction management and observation for final facility construction;



- Preparation of facility operations manuals documenting completed facilities and guidelines for system operations and troubleshooting, and;
- Direct construction costs for permanent piping and instrumentation at the ASR-1&2 wells, to allow automated control of injection for the upcoming injection season.

This task also includes additional budget for the extra construction inspection services associated with the requirement of full-time inspection for the Chemical/Electrical Building required by the City of Seaside.

Task 1.2 – Water Year 2010 Summary of Operations Report. This task consists of preparing a Summary of Operations Report (SOR) documenting the recharge operations and analysis of well performance, water quality and level data collected during WY 2010. The overall scope, content, and format of the SOR will be similar to previous SORs we have prepared for the ASR project. Well and aquifer response data collected during WY 2010 will be analyzed for well performance, plugging rates, aquifer parameters and the effects of well interference between Santa Margarita ASR-1 and ASR-2. Conclusions and recommendations will be made regarding the ongoing operation and maintenance of Santa Margarita ASR-1 and ASR-2 (i.e., long-term injection rates, backflushing frequency, etc). It is also noted that the annual preparation and submittal of SORs is a requirement of the Central Coast RWQCB for the Phase 1 ASR Project.

Task 1.3 – Santa Margarita ASR-2 Rehabilitation Management and Oversight. This task will involve the coordination and oversight of the rehabilitation of the Santa Margarita ASR-2 well. Prior to contractor mobilization, PWR will coordinate a pre-construction meeting to introduce involved parties, establish chain-of-command and communications protocols, review the key work elements and safety procedures, and develop a schedule of the work to be performed. During the rehabilitation of the well, PWR will oversee and document contractor activities to ensure adherence to the project specifications. We will document materials and quantities of well rehabilitation chemicals, field water quality parameters, and production rates during airlifting and pumping. PWR will also monitor and document the handling and discharge of fluids produced from the well during rehabilitation. Following well rehabilitation and replacement of the permanent pump and FCV, PWR will perform performance tests through which the success of the rehabilitation work can be evaluated.

Task 1.4 – Water Year 2011 Operations Support. This task consists of providing operational support for the Phase 1 ASR Project during the WY 2011 recharge season. This includes the development of the WY 2011 ASR operations program, attendance at various meetings during the course of the project, providing as-needed field assistance, and overall project management.

Task 1.4.1 – Project Management and Meetings. PWR will review existing conditions at the site and meet with District and CAW staff at a kick-off meeting to discuss WY 2011 program goals and scheduling. As part of this task, the Phase 1 ASR Project schedule (Gantt Chart) will be updated and maintained. In addition, it is anticipated that on-going “ASR Coordination”



meetings between the District and CAW will continue during the FY 2010-11 period. Consistent with past practice, it is assumed that meetings will be held on an approximate monthly basis and will be attended by a PWR Principal Engineer and/or Hydrogeologist, depending on meeting agenda and project needs at the time. To the extent feasible, PWR attendance at meetings will be coordinated with other project tasks.

Task 1.4.2 – WY 2011 ASR Program Implementation and Field Assistance. This task includes providing as-needed assistance to District and CAW staff with on-going ASR operations, data collection, and water sampling during the WY 2011 program. This will include assistance with the startup of WY 2011 ASR operational phases and periodic downloading and maintenance of project dataloggers. This task also includes the provision of field assistance on an as-needed/requested basis to address critical project needs as they arise. For budgetary purposes and based on our experience during WY 2010, we have assumed this task will involve an initial three-day field visit at the startup of the recharge season and periodic two-day follow-up visits during the season on an approximate monthly basis. This task is an important coordination element during this year as ASR injection and extraction operations transition to the full responsibility of CAW operators under CAW's permit oversight by the California Department of Public Health.

It is our understanding that the District and/or CAW will be responsible for implementing the WY 2011 Sampling and Analysis Plan (SAP). This includes routine field parameter monitoring and the collection/delivery of grab samples to a State Certified Analytical Laboratory (e.g., Monterey Bay Analytical Services, located near the District's office in Ryan Ranch) for SAP analyses. PWR will assist with these efforts on an as-needed/requested basis.

Task 1.4.3 – Santa Margarita ASR-2 Temporary Power. This task consists of providing a temporary power supply to support operation of the Santa Margarita ASR-2 well motor during routine backflushing operations during the WY 2011 injection season. This is needed due to the fact that permanent electrical facilities are not yet completed and will ultimately be located inside the Chemical/Electrical building, which is currently under construction. Pacific Gas & Electric will not install the new upgraded transformer until the new electrical control equipment is in place inside the Facility building; it is currently estimated that this service connection will not be made until March 2011. The temporary power supply is anticipated to be similar to that which was employed during the WY 2010 injection season, consisting of a generator and temporary electrical control panel, to be operated manually. This equipment will be secured and onsite to be capable of conducting well backflushing operations by December 1, 2010. For budgetary purposes, it is assumed that the rental period will be for five months. If feasible, an alternate generator source may be provided by CAW for this purpose, but this is not yet confirmed.

Task 1.5 – Engineering Coordination with CAW, MCWD and City of Seaside for Phase 1 ASR. Completion of the Phase 1 ASR facilities will require ongoing coordination with involved agencies to avoid duplication (or conflict) with utilities and system infrastructure currently being contemplated by CAW for the Coastal Water Project (CWP), Marina Coast Water District (MCWD), and Fort Ord Reuse Authority (FORA) in the proximate area; particularly within the General Jim Moore Boulevard (GJM Blvd) corridor. It is anticipated that at



least 6 meetings will be convened with the various agencies and stakeholders to evaluate and resolve issues related to concurrent projects coordination. For budgetary purposes, we have estimated 6 one-day meetings in Monterey and 24 hours of associated time for this task.

Task 2 – Phase 2 ASR Project

Task 2.1 – Implementation of Temporary Well and Site Improvements at SMSTW.

This task consists of the design, engineering, and implementation of temporary equipment and site improvements at the SMSTW in order to ready it for injection testing during WY 2011. Specific work items for this task include the following:

- Design / select temporary and/or permanent pump for use in well backflushing, and for injection operations (i.e., inclusion of Baski Flow Control Valve) to allow ASR operations in winter 2011;
- Design and procurement of temporary electrical supply (i.e., portable generator) and switchgear to operate the well pump;
- Coordinate setup of temporary aboveground piping valving, and instrumentation at site to facilitate injection operations. Reuse of temporary piping from the Santa Margarita site will be utilized to the greatest extent possible. Field coordination with contiguous CAW transmission main piping will be included as part of this work;
- Construction management for above noted work items, including solicitation of bid quotations, coordination with contractors, and field observation / coordination of construction / installation activities, and;
- Permitting application assistance and coordination with permitting agencies for above work items.

Task 2.2 – SMSTW Baseline Injection Testing. This task consists of performing baseline injection testing of the SMSTW. The primary purpose of the testing is to establish the baseline injection well hydraulics and performance of the new SMSTW. Primary issues to be investigated include:

- Determination of injection well efficiency and specific capacity;
- Evaluation of injection well plugging rates (both active and residual);
- 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 SMSTW and the two ASR wells at the Phase 1 Santa Margarita site.

The baseline testing program for the SMSTW is envisioned to include the following steps:



1. Startup testing of injection piping hydraulics, instrumentation, metering, valving, etc.;
2. 16-hr variable rate injection testing combined with downhole velocity surveys;
3. 24-hr constant rate injection test;
4. 7-day constant rate injection test;
5. Backflushing between each injection test, and;
6. Post-injection production performance testing.

At the conclusion of the baseline testing program, a brief technical memorandum will be prepared documenting the testing results and presenting conclusions and recommendations for the long-term injection operations during the remainder of the WY 2011 recharge season and beyond.

Task 2.2.1 – SMSTW Temporary Power. This task consists of providing a temporary power supply to support operation of the SMSTW well motor during backflushing operations during baseline injection testing and the WY 2011 injection season. The temporary power supply is anticipated to be similar to that which was employed during the WY 2010 injection season at Santa Margarita ASR-2, consisting of a generator and temporary electrical control panel, to be operated manually. This equipment will be secured and onsite to be capable of conducting well backflushing operations by December 1, 2010. For budgetary purposes, it is assumed that the rental period will be for two months (i.e., during the highest flow winter months when the most excess water is anticipated to be available for diversion and testing at this new well facility).

Task 2.3 – Engineering Coordination with CAW, MCWD and City of Seaside for Phase 2 ASR. Similar to the Phase 1 ASR Project, implementation of the Phase 2 ASR facilities will require coordination with involved agencies to avoid duplication (or conflict) with utilities and system infrastructure currently being contemplated by CAW for the Coastal Water Project (CWP) and Marina Coast Water District (MCWD), and FORA in the proximate area, particularly within the GJM Blvd corridor. It is anticipated that at least 3 meetings will be convened with the various agencies and stakeholders to evaluate and resolve issues related to concurrent projects coordination. For budgetary purposes, we have estimated 3 one-day meetings in Monterey and 12 hours of associated time for this task.

Services Not Included

Services which are (or may be) necessary for the completion of this project, which are not included in our proposal include the following:

- Data-loggers and transducers for the Phase 1 ASR Project wells, SMSTW, and other existing SGB monitoring wells (assumed District provided);
- PG&E application or processing fees for initiation of electrical service for the SMSTW site;



- Water quality sampling and analyses (assumed District provided);
- Construction of Phase 1 site facilities (except as noted);
- Permit fees;
- Cost of water, electricity, or other utilities, and;
- Any others items not specifically included in PWR's scope of services.

Estimated Fees and Schedule

Based on the scope of services presented herein, we estimate the fees for our services will be approximately \$667,943, which will be billed on a time-plus-expenses basis in accordance with our current Fee Schedule (attached). An estimated fee summary worksheet is attached summarizing the estimated man-hours and costs per task/work item. A 10 percent contingency has been noted in the attached budget summary (total with contingency is \$734,737) in the event that unforeseen project complications or constraints arise. We recommend the contingency be held for authorization by District staff upon written justification by PWR.

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 two weeks of your authorization.

We appreciate the opportunity to provide assistance to the District on this important water supply project. If you require additional information regarding this or other matters, please call us.

Sincerely,

PUEBLO WATER RESOURCES, INC.

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

Stephen P. Tanner, P.E.
Principal Engineer

RCM:SPT

Attachments: 2010 Fee Schedule
Cost Estimation Spreadsheet



**PUEBLO WATER RESOURCES, INC
2010 FEE SCHEDULE**

Professional Services

Principal Professional.....	\$165/hr
Senior Professional.....	\$150/hr
Project Professional.....	\$135/hr
Staff Professional.....	\$105/hr
Technician.....	\$ 95/hr
Drafting.....	\$ 90/hr
Word Processing.....	\$ 60/hr

Other Direct Charges

Subcontracted Services.....	Cost Plus 15%
Outside Reproduction.....	Cost Plus 15%
Travel Expenses.....	Cost Plus 15%
Per Diem*.....	\$ 150/day
Vehicle	\$ 75/day

Equipment Charges

Drilling Fluid Test Kit.....	\$100/day, \$400/week
Hach DR890.....	\$75/day, \$275/week
Orion ORP/pH/Temp Probe.....	\$75/day, \$275/week
In-Situ Hermit 3000 and Transducer.....	\$125/day, \$400/week
In-Situ Mini-Troll/Level Troll.....	\$100/day, \$300/week
Fuji Ultrasonic Flowmeter.....	\$200/day, \$750/week

*Regionally and seasonally specific to project.

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT
Professional Services for Phase 1 and 2 ASR Projects

Fiscal Year 2010-2011

PWR Project No.: 06-0027



ESTIMATED FEE SUMMARY

LABOR		Principal Professional	Senior Professional	Project Professional	Staff Professional	Technician	Drafting	WP	Hours by Task	Estimated Task Cost	
Hourly Fee		\$165	\$150	\$135	\$105	\$95	\$90	\$60			
Task No.	Task Description										
Phase 1 ASR Project											
1.1	SM Site Engineering and Construction Mgmt	325	-	290	-	-	150	-	765	\$106,275	
1.2	WY2010 Summary of Operations Report	50	80	30	-	-	10	10	180	\$25,800	
1.3	ASR-2 Rehabilitation Oversight	20	130	40	-	-	-	-	190	\$28,200	
1.4	WY2011 Operations Support	100	200	80	-	-	-	-	380	\$57,300	
1.5	Engineering Coordination with CAW, CWP, MCWD	80	-	-	-	-	6	-	86	\$13,740	
1.6		-	-	-	-	-	-	-	0	\$0	
1.7		-	-	-	-	-	-	-	0	\$0	
									Task 1 Subtotal	1601	\$231,315
Phase 2 ASR Project											
2.1	SMSTW Temporary Site Improvements Engineering	60	-	-	-	-	40	-	100	\$13,500	
2.2	SMSTW Baseline Injection Testing	30	120	-	-	-	3	2	155	\$23,340	
2.3	Engineering Coordination with CAW, CWP, MCWD	40	-	-	-	-	4	-	44	\$6,960	
2.4		-	-	-	-	-	-	-	0	\$0	
2.5		-	-	-	-	-	-	-	0	\$0	
									Task 2 Subtotal	299	\$43,800
Hours by Labor Category:		705	530	440	0	0	213	12			
Costs by Labor Category:		\$116,325	\$79,500	\$59,400	\$0	\$0	\$19,170	\$720			
									Total Labor Hours:	1900	
									Total Labor Costs:	\$275,115	

OTHER DIRECT COSTS (ODC's)					
Task No.	Item	Units	Unit Price	No. of Units	Fee
1	Vehicle	Daily	\$75	45	\$3,375
1	Travel Per Diem	Daily	\$150	45	\$6,750
2	Vehicle	Daily	\$75	15	\$1,125
2	Travel Per Diem	Daily	\$150	15	\$2,250
Subtotal ODCs:					\$13,500

OUTSIDE SERVICES					
Task No.	Item	Units	Unit Price	No. of Units	Fee
1.1	Engineering Subconsultants	Lump Sum	\$72,100	1	\$72,100
1.4	ASR-2 Generator Rental	Monthly	\$9,650	5	\$48,250
1.6	ASR 1 & 2 permanent piping construction costs	Lump Sum	\$153,000	1	\$153,000
2.1	SMSTW Engineering subconsultants	Lump Sum	\$4,200	1	\$4,200
2.2	SMSTW Downhole Velocity Surveys	Lump Sum	\$5,000	1	\$5,000
2.2	SMSTW Generator Rental	Monthly	\$14,400	2	\$28,800
2.4	SMSTW Temporary piping construction costs	Lump Sum	\$18,500	1	\$18,500
Subtotal Outside Services:					\$329,850
Subtotal Outside Services w/ Markup (15%):					\$379,328

COST SUMMARY	
Labor	\$275,115
Other Direct Costs	\$13,500
Outside Services	\$379,328
Subtotal:	\$667,943
10 % Contingency	\$66,794
TOTAL ESTIMATED PROJECT COST:	\$734,737