



May 25, 2012
Project No. 12-0040

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

Attention: Mr. Joe Oliver, Water Resources Manager

Subject: Seaside Middle School ASR-4 Project; Proposal for Hydrogeologic Oversight and Construction Management Services for Well Construction and Testing

Dear Mr. Oliver:

In accordance with your request, Pueblo Water Resources, Inc. (PWR) is pleased to submit this proposal for professional hydrogeologic and construction management services associated with the construction and production testing of the Seaside Middle School ASR-4 well (SMS ASR-4). Presented in this proposal are a detailed scope of work, schedule, and estimated costs for our services on the project.

The SMS ASR-4 well is part of the Monterey Peninsula Water Management District (MPWMD or District) and California American Water's (CAW) cooperative implementation of Aquifer Storage and Recovery (ASR) on the Monterey Peninsula. Installation of SMS-4 is part of the ongoing full implementation of ASR Water Project 2 (a.k.a. Phase 2 ASR Project), which generally consists of two ASR wells and appurtenant facilities at the Seaside Middle School (SMS) ASR Facility site. SMS ASR-4 will be the second full-scale ASR well installed at the SMS ASR site. The existing well at the site, SMS ASR-3, was constructed in 2010 and is located approximately 400 feet south/southwest of the planned location of SMS ASR-4. When fully implemented, ASR Water Project 2 is estimated to yield an average of 1,000 acre feet per year (afy) and has a combined dual-well injection/recharge rate permitted with the State Water Resources Control Board of 8 cubic feet per second, equivalent to approximately 3,590 gallons per minute (gpm).

As you know, PWR recently designed and prepared the specifications and bid package for the SMS ASR-4 well. Bids from qualified C-57 well drilling Contractors were advertised on April 26, 2012 and opened publicly on May 16, 2012. The District desires to award the project and have all the contract documents in place so that work may begin on or around June 11, 2012. The Contractor will have one-hundred twenty (120) days from the commencement of work activities to complete project work. A critical element of the project is to coordinate the majority of disruptive work activities during the summer break period for Seaside Middle School, which occurs during the period June 11 through August 7, 2012. It is possible, however, that some work associated with the project will need to be performed after the new school year starts. Should that be required, unique work day/work hour restrictions may be implemented to avoid disrupting the school operations.



We have developed a comprehensive scope of work for construction management and baseline production testing for the SMS ASR-4 project. Our proposed work scope is based on our extensive experience with similar ASR well construction projects (including the Santa Margarita ASR-1 and ASR-2 wells, and SMS ASR-3). The general scope of work proposed for this initial phase of the SMS ASR-4 project includes the following fundamental elements:

- Management and oversight of well drilling and construction
- Oversight of baseline well production performance testing and water-quality analyses
- Summary of Operations Reporting

A detailed scope of work to oversee the construction and initial production testing of the SMS ASR-4 well is presented below:

SCOPE OF WORK

Task 1 – Project Management and Meetings

This task consists of overall project management, including the preparation of routine project correspondence, invoices, and monthly budget status updates. Effective project communication is critical for the success of this important project. In consultation with the District, a project e-mail distribution list will be established through which routine project status reports will be provided. We will also provide update communications to school staff as needed. This task also includes coordinating NPDES discharge permitting with the Regional Water Quality Control Board for well development and test pumping discharge disposal.

PWR will coordinate and conduct a pre-construction meeting at the well site. The purpose of the pre-construction meeting is to introduce all parties that will be involved in the field work associated with the project, outline the scope of work, resolve any outstanding logistical issues, review permit requirements, and establish the schedule for the work to be performed in the field. After the initial pre-construction meeting, it is anticipated that periodic project status meetings may also be held during the course of the project, as project events warrant.

Task 2 – Construction Management and Testing

PWR will serve as the primary point of contact with the Contractor for the District during well drilling, construction and testing. We will observe and document the work performed, verify Contractor adherence to the well drilling specifications, oversee the collection of critical hydrogeologic data, and document all testing operations. A detailed description of the work proposed for each of the subtasks associated with the drilling, construction and testing of SMS ASR-4 is provided below.

Task 2.1 – Mobilization PWR will oversee the Contractor mobilization and set up of equipment at the site to ensure that drilling equipment is set up properly, various permit conditions are met, and logistical arrangements are consistent with the planning for the project. PWR will also be available to answer any questions Contractor staff may have during the mobilization process.



Task 2.2 – Conductor Casing PWR will document the drilling, placement and cementing of the surface conductor casing. The importance of the surface conductor casing is often overlooked in well construction projects, as improper placement, positioning, and/or sealing of the surface conductor can lead to serious problems in subsequent phases of the work (e.g., misaligned pilot hole and casing installation problems).

Task 2.3 – Pilot Hole Drilling PWR will document Contractor activities and prepare a detailed lithologic log of the pilot borehole. The lithologic log will include descriptions of the cutting samples, a graphical representation of the stratigraphy and target aquifer zones, the drilling penetration rate, drilling fluid properties, and rig activity.

Samples will be collected throughout the entire depth of the borehole. Samples of each 10-foot interval will be placed in clear plastic compartmentalized storage boxes. Two sets of sample boxes will be prepared. The sample boxes allow for easy correlation of the geophysical log and visualization of the borehole stratigraphy and aquifer materials. Bulk samples of selected materials from the Santa Margarita Sandstone aquifer will also be collected (for possible future mineralogical analyses). PWR will witness and direct the geophysical logging once pilot hole drilling is complete. The lithologic and geophysical data will be reviewed and evaluated with respect to the planned placement of well components (screen depths and total well completion depth) and the final well design will be developed.

Task 2.4 – Reaming and Well Construction Immediately upon completion of the pilot hole, reaming of the borehole to the final diameter will commence. During reaming, PWR will document Contractor activities and drilling fluid properties. Maintenance of appropriate drilling fluid properties during reaming is critical in minimizing damage to the aquifer and to the ultimate performance of the well and overall success of the project.

After reaming, PWR will observe and document the well construction. Placement of the well components (screen sections, blank sections, centralizers) and annular materials (gravel pack and concrete seal) will be recorded, along with the materials and methods used for construction. PWR will record the amount of annular materials added and the depth of the tremie pipe during all stages of gravel packing and cementing. The actual amount of annular material added will be compared to the theoretical amounts as calculated from the caliper survey to verify proper placement of materials within the annulus.

Task 2.5 – Well Development The well will be thoroughly developed by a combination of bailing, airlift/swabbing, and pumping/surging. PWR will oversee and document all phases of well development. Development procedures and durations will be recorded along with observations of the development water, and measurements of field water-quality parameters. All discharges and NPDES monitoring results will be documented and recorded.

During pumping and surging, PWR will maintain a detailed log of the pumping rate, water levels and specific capacity. Sand production and water clarity (turbidity) will also be recorded. Graphical summaries of development data will be routinely updated and used to evaluate the progress and efficacy of development operations. This will be important in



evaluating the point at which development should be considered to be complete, or whether additional/alternative development efforts are warranted (e.g., backwashing).

Task 2.6 – Baseline Production Testing Following completion of well development, essential baseline production and groundwater-quality data will be acquired through the formal performance testing. The following tests are anticipated:

- Step discharge test (12 hour)
- Continuous-rate discharge test (24 hour)
- Recovery test (24 hour)

Water levels in the SMS ASR-4, ASR-3 and the two existing monitoring wells at the SMS site will be measured and recorded throughout the testing period with pressure transducers/data loggers. PWR will also oversee and document the results of velocity profiling (spinner surveys) that will be performed during the step test, which is used to quantify the vertical distribution of production within the perforated intervals.

During production testing, groundwater quality will be routinely monitored using field devices. The field parameters will include: temperature, pH, turbidity, conductivity, ORP, hydrogen sulfide, and any other parameters that may be required by the NPDES Permit. A laboratory water-quality testing program will also be developed, and PWR will coordinate sample collection and analysis with the laboratory.

Task 2.7 – Permanent Pump/Motor/FCV Assembly Installation PWR will evaluate the production testing results and confirm/finalize the specifications for the permanent pump/motor and downhole flow control valve (FCV) assembly. It is anticipated that the pump/motor/FCV assembly will be similar (if not identical) to that recently installed at SMS ASR-3. PWR will also oversee the installation and startup testing of the assembly. Plans will be developed for temporary electrical/switchgear equipment for operating the pump on a short-term testing basis. It is anticipated that the pump discharge for purposes of startup testing will be routed to the backflush pit at the Santa Margarita (SM) ASR Facility via the existing piping between SMS ASR-3 and the SM ASR Facility and the temporary piping that will be installed by the Contractor between SMS ASR-4 and ASR-3.

Task 2.8 – Demobilization and Cleanup PWR will oversee the demobilization of the Contractor equipment from the site and ensure that cleanup operations and the site conditions prior to the Contractor's final departure from the site are compliant with the specification's requirements.

Task 3 – Reporting

The reporting task will consist of producing three reports; a draft Summary of Operations Report (SOR), a NPDES compliance report for submittal to the RWQCB, and a final SOR. Detailed descriptions of each of these reports are presented below:



Task 3.1 – Draft Summary of Operations Report PWR will prepare a draft SOR for the SMS ASR-4 well upon completion of the field activities. The report will provide comprehensive documentation of well construction details and all aspects of the work performed during the project, and will include the following:

- Lithologic and geophysical logs (including digital data)
- Documentation of well construction materials and methods
- As-built well construction details
- Well development and production-testing data
- Water-quality data
- Project photographs

The draft report will also include a summary table of all key information related to the well, such as permit numbers, the tentative State Well Number, GPS coordinates, well construction details, and baseline well performance data.

Task 3.2 – NPDES Compliance Reporting PWR will compile all field water-quality data, laboratory analytical reports, and flow information related to NPDES associated discharges, and will prepare a brief transmittal report for submittal to the RWQCB. The report will contain all the requisite information in the specified format necessary for compliance with the Board Order and the associated Monitoring and Reporting Program.

Task 3.3 - Final Summary of Operations Report Once the District has reviewed the draft report and provides final comments, PWR will prepare the final report. Ten copies of the final report will be provided to the District, including a copy of the report in digital (PDF) format. PWR will also transmit to the District all digital files of collected water-level data, geophysical data, water-quality data, and project photographs.

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:

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



ESTIMATED FEES

Our estimated costs for the SMS ASR-4 construction project were developed based on the proposed scope of work, our experience with similar projects, and our 2012 Fee Schedule (attached). In developing our estimate of costs for this project, we have assumed that certain aspects of the work will be performed on a 24-hour per day schedule, and that observation during some activities will be on a variable basis with particular focus on the critical stages of drilling and construction. Presented below is a summary table showing our assumptions for estimating our costs associated with construction and inspection:

Estimated Construction and Inspection Schedule

Task	Description	Work Hours	Duration (days)	Inspection Staffing (%)	Estimated Man-Hours
2.1	Mobilization	Days	10	25	30
2.2	Conductor Casing	Days	2	75	18
2.3	Pilot Hole Drilling	24	5	100	120
2.4	Reaming and Well Construction	24	9	75	162
2.5 (a)	Well Development (Swab/Airlift)	24	5	75	90
2.5 (b)	Well Development (Pumping)	Days	5	50	30
2.6	Production Testing	24	3	50	36
2.7	Pump/Motor/FCV Installation	Days	5	50	30
2.8	Demobilization and Clean-Up	Days	5	25	15

The estimated labor costs for the major tasks, the costs for the equipment and other direct costs that will be required for completion of the project, and the costs associated with outside services, are summarized in the table below:

Estimated Costs Summary

Task No./Description	Estimated Cost
1 – Project Management	\$5,420
2 – Construction Management and Testing	\$76,950
3 – Reporting	\$16,460
Equipment and Other Direct Costs	\$18,650
Outside Services	\$6,900
Estimated Costs	\$124,380
Contingency (10%)	\$12,438
Total Estimated Cost (including contingency)	\$136,818



As shown, based on the scope of services presented herein we estimate the fees for our services will be approximately \$124,380, 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 \$136,818) 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.

Please note that the costs for our services for this project have been developed in accordance with the assumed project schedule. The actual project schedule, particularly during the period when potential work schedule/work hour restrictions may apply (after school starts), may necessitate a revision to our estimate of time and related costs that would be required to fulfill our work scope. Once the final schedule for work is developed, we will re-assess our estimate for man-hours and costs to determine if any changes are warranted or necessary.

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

RCM

Attachments: Cost Estimation Spreadsheet
2012 Fee Schedule

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT
SMS ASR-4 Well - Professional Services for Construction Management, Testing, and Reporting
PWR Project No.: 12-0040



ESTIMATED FEE SUMMARY

LABOR	Principal Prof.	Senior Prof.	Project Prof.	Staff Prof.	Tech.	WP	Illustrator	Hours by Task	Estimated Task Cost
Hourly Fee	\$175	\$160	\$145	\$115	\$105	\$90	\$70		
Task	Task Description							Hours by Task	Estimated Task Cost
1	PROJECT MANAGEMENT								
1.1	Project Management & Meetings	8	24				2	34	\$5,420
2	CONSTRUCTION MANAGEMENT/TESTING								
2.1	Mobilization	4	26					30	\$4,860
2.2	Conductor Casing		18					18	\$2,880
2.3	Pilot Hole Drilling	4	36	20	60			120	\$16,260
2.4	Reaming and Well Construction	4	60	24	74			162	\$22,290
2.5 (a)	Well Development (airlift/swab)		40	20	30			90	\$12,750
2.5 (b)	Well Development (pumping)		30					30	\$4,800
2.6	Baseline Production Testing		36					36	\$5,760
2.7	Pump/Motor/FCV Installation	10	20					30	\$4,950
2.7	Demobilization and Clean-Up		15					15	\$2,400
3	REPORTING								
3.1	Draft Summary of Operations Report	8	16	16		8	16	64	\$8,120
3.2	NPDES Compliance Reporting	4	16			8		28	\$3,980
3.3	Final Summary of Operations Report	4	8	12		4	4	32	\$4,360
Hours by Labor Category:		46	345	92	164	0	22	20	
Costs by Labor Category:		\$8,050	\$55,200	\$13,340	\$18,860	\$0	\$1,980	\$1,400	
								Total Labor Hours:	689
								Total Labor Costs:	\$98,830

EQUIPMENT AND OTHER DIRECT COSTS	Unit Rate	Unit Price	No. of Units	Fee
Water-Level Transducer/Datalogger	Weekly	\$400	2	\$800
Field Water Quality Instrument	Weekly	\$275	2	\$550
Ultrasonic Flowmeter	Weekly	\$750	1	\$750
Drilling Fluid Test Kit	Weekly	\$400	2	\$800
Vehicle	Daily	\$75	70	\$5,250
Per Diem	Daily	\$150	70	\$10,500
Subtotal Equipment and ODCs:				\$18,650

OUTSIDE SERVICES	Units	Unit Price	No. of Units	Fee
Relocate Temporary Motor Starter for Perm Pump Testing	Lump Sum	\$5,000	1	\$5,000
Field Office Trailer	Monthly	\$500	2	\$1,000
Subtotal Outside Services:				\$6,000
Subtotal Outside Services w/ Markup (15%):				\$6,900

COST SUMMARY	
Labor	\$98,830
Equipment and Other Direct Costs	\$18,650
Outside Services	\$6,900
10 % Contingency	\$12,438
TOTAL ESTIMATED PROJECT COST:	\$136,818



**PUEBLO WATER RESOURCES, INC
2012 FEE SCHEDULE**

Professional Services

Principal Professional.....	\$175/hr
Senior Professional.....	\$160/hr
Project Professional.....	\$145/hr
Staff Professional.....	\$115/hr
Technician.....	\$ 105/hr
Illustrator.....	\$ 90/hr
Word Processing.....	\$ 70/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
Field Water Quality Meter (Hach DR890).....	\$75/day, \$275/week
Orion ORP/pH/Temp Probe.....	\$75/day, \$275/week
Water Level Probes (In-Situ Mini-Troll/Level Troll).....	\$100/day, \$300/week
Fuji Ultrasonic Flowmeter.....	\$200/day, \$750/week

*Regionally and seasonally specific to project.