

ATTACHMENT 4
PROJECT DESCRIPTION

For the “AttachmentName” in the naming convention of BMS, use “ProjD” for this attachment.

Provide a complete, detailed description of the proposed project, including the goals of the project, needed facilities and their location, and the area covered. Maps are generally not required (also see Attachment 5), but can be very helpful in explaining the proposed project. Describe how the project supports the goals and objectives of the GWMP. Applicant must clearly explain the relevance of project to the GWMP.

The Alameda County Water District’s (ACWD) grant application, “Niles Cone Saltwater Intrusion and Aquifer Characterization Project,” proposes the installation of six groundwater monitoring wells in the western and southern sections of the Niles Cone Groundwater Basin (where brackish water has been detected and potentially threatens ACWD’s Mowry Wellfield) and the collection of 30 groundwater samples for groundwater chemistry analyses. This proposal directly supports the primary goal of ACWD’s Groundwater Management Policy since the additional monitoring wells and chemistry analyses will enhance ACWD’s ability to efficiently protect and manage the Niles Cone Groundwater Basin and to ensure a reliable supply of high quality water that satisfies the present and future water needs in ACWD’s service area (ACWD Groundwater Management Policy Statement). The proposed project would also provide valuable information towards achieving the following objectives of ACWD’s Groundwater Management Policy:

“Protect groundwater quality from degradation from any and all sources including: saline water intrusion.”

“Improve groundwater quality by (1) removing salts and other contaminants from affected areas of the basin.”

The following information will explain the relevance of this project to ACWD’s Groundwater Management Policy’s goals and objectives.

During 1995 to 1996, ACWD installed aquifer specific monitoring wells in the vicinity of the Mowry Wellfield, located just west of the Hayward Fault (see **Figure 1; Att4_LGA12_ACWD_ProjD_2of3). Samples collected from these wells document increasing concentrations of chlorides in the third deepest aquifer named by DWR as the Fremont Aquifer. Additional aquifer specific monitoring wells and well clusters were subsequently installed and documented elevated chloride levels in both the Centerville (the aquifer above the Fremont Aquifer) and Fremont Aquifers, but not in the same locations. This information has been perplexing since the Centerville and Fremont Aquifers have been considered as one combined aquifer and referred to as the Centerville-Fremont Aquifer.**

During January through June, 2009, ACWD installed eleven monitoring wells in the central portion of the Niles Cone Groundwater Basin specifically targeting the Centerville

and Fremont Aquifers in an attempt to delineate the extent of the elevated chloride levels. This well installation project, “Inland Saltwater Intrusion Monitoring Wells Project”, was performed under a DWR Local Groundwater Assistance Grant awarded in 2008. Results from this project supports the supposition that the brackish water in the vicinity of the Mowry Wellfield appears to be concentrated where DWR has documented inferred major depositional channels (Figure 2; Att4_LGA12_ACWD_ProjD_2of3) in both the Centerville and Fremont Aquifers (Figures 3 and 4; Att4_LGA12_ACWD_ProjD_2of3). The previous project further supports the idea that the Centerville and Fremont Aquifers are distinct water bearing zones with areas of possible interconnection. Unfortunately, due to the complexities of the depositional environment of the Niles Cone, the previous project was unable to delineate the southern and western boundaries of the brackish water in the Centerville and Fremont Aquifers, respectively, and it did not clearly identify where interconnections between the two aquifers were occurring.

The purpose of drilling these proposed wells (western and southern portion of the basin) and conduct aquifer chemistry testing (throughout the basin) is to explore the subsurface geology in the western and southern reaches of the Niles Cone Groundwater Basin (where there is lack of geologic information), attempt to delineate the brackish water extent in the two aquifer zones, and to gain a better understanding of the relationship between the Centerville and Fremont Aquifers. The locations selected for the monitoring wells are based on data collected during ACWD’s Spring and Fall monitoring programs, ACWD’s “Inland Saltwater Intrusion Monitoring Wells Project”, and work previously conducted by DWR that was documented in DWR Bulletin No. 118-1, Evaluation of Ground Water Resources South Bay, Appendix A: Geology, August 1967.

The additional monitoring wells are required in order for ACWD to properly monitor the brackish water, manage the groundwater basin, and protect the Mowry Wellfield (Figure 1; Att4_LGA12_ACWD_ProjD_2of3). Three of the eight production wells in the Mowry Wellfield are screened in the Centerville-Fremont Aquifer. The construction of new monitoring wells will provide an opportunity to obtain valuable geologic and hydrogeologic information on the relationship between the Centerville and Fremont Aquifers and increase ACWD’s understanding of the locations of inferred major depositional channels in the basin. The new geologic information will be incorporated along with other data in a RockWorks software program to develop a conceptual geologic model to improve ACWD’s understanding of the stratigraphy in the area. The geologic and water level data are also expected to help improve ACWD’s Integrated Groundwater and Surface Water Model which is used to manage the groundwater basin and estimate the amount of supplemental water to be purchased each year to prevent saltwater intrusion.

A total of six wells are proposed to be installed at four sites, two sites with Centerville and Fremont Aquifer monitoring wells and two sites with one Centerville Aquifer monitoring well (Figure 5; Att4_LGA12_ACWD_ProjD_2of3). At all of the proposed drilling locations, little to no geologic or hydrogeologic information exists. One exploratory boring will be drilled at each site to a depth of 800 feet below ground surface to obtain a detailed geologic profile of the alluvial material. At the proposed sites for Centerville and Fremont Aquifer monitoring wells (Sites 7 and 8), the exploratory boring will be converted into a

monitoring well at an approximate depth of 350 feet. An additional Centerville Aquifer monitoring well will be completed (based on the exploratory boring lithology) approximately 10 feet away to a depth of 250 feet. At the locations with only a Centerville Aquifer monitoring well proposed (Sites 5 and 6), the exploratory boring will be completed as a monitoring well at a depth of approximately 250 feet. The new monitoring wells will provide long term monitoring points needed for tracking groundwater flow patterns and groundwater quality.

In an effort to further identify areas of possible interconnections between the Centerville and Fremont Aquifers in the vicinity of elevated chloride levels, 30 groundwater samples will be collected from monitoring wells (in both the Centerville and Fremont Aquifers) at locations around the basin in an attempt to “fingerprint” unique characteristics of both the Centerville and Fremont Aquifers. The groundwater samples will be analyzed for cations and anions percentages and plotted on ternary plots (Piper diagram). A Piper diagram will be created for each groundwater sample and compared for similarities, differences, and commonalities.

In summary, these exploratory borings, associated monitoring wells, and the groundwater chemistry information are necessary for the following reasons: 1) groundwater is a significant source of drinking water in the area; 2) saltwater intrusion is a significant impairment to groundwater quality; 3) delineation of the brackish water is necessary to properly manage the groundwater basin; 4) areas of interconnection need to be identified to understand the potential movement of brackish water between aquifers; and 5) long term monitoring points are required to properly monitor the brackish water, manage the Niles Cone Groundwater Basin, and protect the Mowry Wellfield.

Describe the quality and usefulness of the information that will be obtained using technically feasible methods. Include a discussion of data, technical methods, and analyses to be used. The level of detail should be sufficient to determine the technical feasibility of the proposed project.

The locations selected for the monitoring wells are based on data collected during ACWD's Spring and Fall monitoring programs as well as work previously conducted by DWR that was documented in DWR Bulletin No. 118-1, *Evaluation of Ground Water Resources South Bay, Appendix A: Geology*, August 1967. During 1995 to 1996, ACWD installed aquifer specific monitoring wells in the vicinity of the Mowry Wellfield, located just west of the Hayward Fault. Samples collected from these wells document increasing concentrations of chlorides in the Fremont Aquifer. Additional aquifer specific monitoring wells and well clusters were subsequently installed and documented elevated chloride levels in both the Centerville and Fremont Aquifers, but not in the same locations. The purpose of drilling these wells and conduct aquifer chemistry testing is to explore the subsurface geology in the western and southern reaches of the Niles Cone Groundwater Basin (where there is lack of geologic information) to 800 feet, attempt to delineate the brackish water extent in the two aquifer zones, and to gain a better understanding of the relationship between the Centerville and Fremont Aquifers.

For planning purposes, the depth of the proposed monitoring wells for the Centerville and Fremont Aquifers are estimated to be 250 feet and 350 feet, respectively. These depths are based on previous work conducted by ACWD at other locations throughout the basin. At all four of the proposed drilling locations, there is very little to no information thus, the exploratory borings are expected to be drilled to a depth of approximately 800 feet to gain information prior to constructing the monitoring wells. Based on DWR Bulletin No. 118-1, Appendix A (and existing well information) drilling to a depth of 800 feet should provide complete information for not only the Centerville and Fremont Aquifers, but also a geologic and hydrogeologic profile of the western and southern portion of the Niles Cone Basin.

The wells will be drilled and constructed by a drilling contractor licensed in the State of California with a valid C-57 license. The boreholes will be drilled using a mud rotary drilling rig. All boreholes will be drilled with a diameter of at least 6-inches to comply with ACWD's guideline requirement for a 2-inch minimum annular seal around each well. During drilling, samples will be collected and materials will be classified by ACWD's Professional Geologist following the Manual Soil Description Standard (ASTM D2488-00) and the Unified Soils Classification System.

Geophysical tests will be performed in all the new exploratory borings. The testing will include: resistivity, spontaneous potential, conductivity, and gamma logs. ACWD will evaluate the geophysical log and lithologic log to determine the screening interval and proper design for each well.

The monitoring wells will be initially developed using a surge block and compressed air on the drill rig. The drilling team will be followed by a well development team responsible for final well development. The wells will be developed using a surge block/airlift method.

Debris in the bottom of the well will be bailed out. A well development log will be kept to document well development activities and will include volume purged, general aquifer parameters (temperature, conductivity, and pH), and note water clarity.

The results from this project will improve the level of characterization of the Niles Cone Groundwater Basin as identified in DWR Bulletin No. 118-03. In the bulletin’s summary of the Niles Cone Subbasin (Basin Number 2-9.01), there are individual descriptions of the Centerville and Fremont Aquifers. However, the bulletin also notes that “the aquitard separating the Fremont and Centerville Aquifers is generally absent or thin near the inner portions of the alluvial fan and the aquifers are commonly referred to as the Centerville-Fremont Aquifer.” As a result of this project, we will gain a better understanding of the relationship between the Centerville and Fremont Aquifers and whether it is appropriate to continue to consider the aquifers as one combined aquifer.

Describe how the applicant collaborates with other local public agencies with regard to the management of the affected groundwater basin. Discuss and provide evidence that a process is or will be in place that informs groundwater users, stakeholders, and the general public about the project to be funded with the proposed grant and disseminates relevant reports and data. A stakeholder is an individual, group, coalition, agency or others who are involved in, affected by, or have an interest in the implementation of a specific program or project. Explain and document how federal and other State agencies will be contacted. Examples include workshops, regularly scheduled groundwater association meetings, public notices, informational mailings, and websites.

Board of Directors Meetings: The Alameda County Water District (ACWD) is governed by a five-member Board of Directors that typically conducts Board meetings on the second Thursday of each month, usually at 6:00 p.m. These meetings are open to the public and notices of the meetings are sent seven days in advance to the local newspaper, The Argus, and posted on the bulletin board in front of ACWD’s headquarter building. Subsequently, copies of the meeting agenda are sent 72 hours in advance to The Argus; a weekly free community newspaper called the Tri-City Voice; the cities of Fremont and Newark; and interested local residents, and the agenda is posted on the bulletin board in front of ACWD’s headquarter building and on ACWD’s web site at http://www.acwd.org/bod_meetings.php5. The meetings are also advertised in bimonthly informational newsletters, The ACWD Aqueduct, that are sent directly to ACWD’s customers.

A staff report and resolution was prepared for the June 14, 2012 Board of Directors Meeting recommending the adoption of a resolution authorizing the General Manager to file an application and enter into an agreement for a grant from DWR for the Niles Cone Saltwater Intrusion and Aquifer Characterization Project. A copy of the June 14, 2012 Board of Directors meeting agenda and the staff report are included in **Attachment 1 (Att1_LGA12_ACWD_AuthDoc_2of4 and Att1_LGA12_ACWD_AuthDoc_3of4)**. The staff report was sent to the key stakeholders and other interested agencies for their comments and input.

Stakeholders: As a result of the Board meeting process described above and outreach to stakeholders, all potential stakeholders have been notified of the proposed project. Since all of the proposed well locations are located on United States Fish and Wildlife Service properties, ACWD has been in contact with the United States Fish and Wildlife Service regarding this project. Each of the proposed well locations were visited and discussed with United States Fish and Wildlife Service staff and the United States Fish and Wildlife Service has indicated that they are supportive of the project and would be willing to issue encroachment permits to ACWD. In the United States Fish and Wildlife Service letter of support (see **Att4_LGA12_ACWD_ProjD_3of3**), they state that “We have, and still do work closely with ACWD on projects concerning saltwater intrusion in the Niles Cone Groundwater Basin. The U.S. Fish and Wildlife Service supports this application request and will provide access and guidance with wildlife issues that may arise.” In addition, the proposed well locations are within the cities of Fremont and Newark, and the cities have not expressed any concerns regarding the project.

Regional Board Groundwater Committee Meetings: ACWD is a member of the California Regional Water Quality Control Board – San Francisco Bay Region’s Groundwater Committee that met quarterly and shares information as needed through e-mail. The committee consists of a cross-section of Regional Board staff as well as local agency representatives. Although the committee has not been meeting for about a year due to budget/staffing issues, the committee will be kept informed about ACWD’s grant project. During previous DWR grant projects, members of the Groundwater Committee meeting visited some of the drilling sites to be briefed on the status of the projects, observed drilling activities, inspected soil samples from various depths, and discussed the value of the information gained from the projects. These field trips by committee members have been well received and ACWD will invite the Groundwater Committee to visit the drilling locations during this proposed project.

Project Outreach Activities: As indicated in the project work plan, budget, and schedule, public outreach activities are planned prior to, during, and subsequent to the installation of the monitoring wells. All of the public outreach activities prior to the project have been described above.

When ACWD’s drilling contractor is given the notice to proceed for the project and ACWD is notified of the drilling schedule, ACWD will identify all residents and businesses within 0.25 miles of the first drilling site and directly deliver notification letters that will be left as door hangers. The notification letters will provide the estimated date that drilling activities are expected to begin, the hours of work, the purpose of the project, the potential impacts that the project may have on their neighborhood, and a site map. In addition, the letter will identify ACWD’s project manager and provide contact information so that any questions or concerns can be addressed during and after normal business hours. As the work progresses at a drilling site and an estimated schedule can be developed for the next drilling site, the notification process will be repeated for each subsequent site.

As each monitoring well is completed, an inspection of each drilling site will be jointly conducted by ACWD and the United States Fish and Wildlife Service to ensure that they are satisfied with the final completion and the condition of the site. Any concerns identified by the United States Fish and Wildlife Service will be addressed by ACWD or ACWD’s contractor.

After all field activities and the final report have been completed and accepted by DWR, copies of the report will be submitted to all interested parties. It is anticipated that the following agencies may request copies of the report: City of Fremont, City of Newark, East Bay Municipal Utilities District, Regional Water Quality Control Board, the United States Fish and Wildlife Service, and the United States Geological Survey. In addition, an electronic copy of the final report will be available on ACWD’s website at: http://www.acwd.org/engineering/groundwater.php5#dwr_gwtr_proj which is where the final reports from three previous DWR grant projects are located.

Explain how ongoing use of the products derived from the proposed project will be funded after grant funds are expended. Additional State grant funds to continue with the funded project should not be a consideration. Provide examples of how often and under what funding mechanism monitoring wells will continue to be monitored, models maintained and used in the future, automated monitoring equipment maintained, or data management systems be updated and maintained. Include a discussion of measures that will be used to evaluate data and mechanisms to adapt the data collection process as new information is obtained. For proposals to develop a GWMP, explain how the GWMP will be implemented and how it will be funded.

Immediately following the installation of the monitoring wells, the monitoring wells will be incorporated into ACWD's spring and fall monitoring programs so that water level information and water quality information will be collected twice a year. This monitoring program has been conducted for over 50 years and is included in the biannual budgeting process so that sufficient staff labor and laboratory analytical costs are allocated to accomplish the objectives of the basin monitoring program. ACWD has a database system to store water level and water quality information and the information is updated at least twice a year after the spring and fall monitoring events. At the end of each year, this information is used to construct water level and water quality contour figures that are included in the annual Groundwater Monitoring Reports. The Groundwater Monitoring Report is a major part of ACWD's Groundwater Management Plan and the report allows ACWD to assess the effectiveness of groundwater basin management activities related to saltwater intrusion such as groundwater recharge and the Aquifer Reclamation Program. The data collected from the proposed wells will also be included in the set of wells reported to CASGEM and submitted no later than January 1 and July 1 of each year.

ACWD anticipates that these wells may also be incorporated as part of an overall monitoring network that would be utilized by ACWD and EBMUD in the cooperative management of groundwater supplies in the Niles Cone and South East Bay Plain groundwater basins, respectively. If frequent information needs to be collected, especially during the operation of EBMUD's Bayside Groundwater Project, pressure transducers will be installed in the monitoring wells. The water level information collected by the transducers can be downloaded directly into a lap top computer and stored electronically.

The data collected from the new monitoring wells will also be used in the regional groundwater flow model of the Niles Cone and South East Bay Plain Groundwater Basins. The model was developed using the Integrated Groundwater and Surface Water Model code and is used to evaluate the potential effects of EBMUD's Bayside Groundwater Project on the two groundwater basins. As this model also replaces ACWD's previous flow model, it will be used to support other groundwater related programs and projects in the Niles Cone. Since there was very little geologic and water level information in the central portion of the Niles Cone during the development of the model, the new data collected from this project could be used to re-calibrate the model, if necessary, to ensure that the water levels predicted by the model closely simulate actual data collected from new and existing monitoring wells.