

Groundwater Management Plan Development and Data Gaps Evaluation

The McKinleyville Community Services District (MCSD) and its governing board are seeking funding to conduct a groundwater study to develop a local Groundwater Management Plan (GWMP) for adoption. Current understanding of the local groundwater basin (Dows Prairie) is limited and an evaluation of hydrogeologic conditions and water quality is warranted in order to ensure protection and long-term availability of groundwater resources. The MCSD has been working with Humboldt County's regional water supplier, Humboldt Bay Municipal Water District (HBMWD) to establish a regional intertie within the two entities water systems.

The MCSD will ensure that the GWMP for its coverage area includes significant public input through the McKinleyville Municipal advisory committee, while working closely with the HBMWD to coordinate local water issues of mutual interest. Implementation of a local GWMP and an evaluation of data gaps will increase knowledge of the basin and improve groundwater management.

Study Area

Dows Prairie is a groundwater sub-basin of the Mad River Valley Groundwater Basin, located in the North Coast Hydrologic Region of California, in Humboldt County (Figure 1). The Mad River Valley basin and Dows Prairie sub-basin are defined by the California Department of Water Resources as basin areas 1-8 and 1-8.02, respectively. The Mad River Lowland sub-basin (1-8.01) is also part of the Mad River Valley Groundwater Basin. The location of the Mad River Valley groundwater basin and the two sub-basins are shown in Figure 2.

Issues and objectives

The MCSD and HBMWD are in the business of providing water services and have overlapping jurisdiction with respect to groundwater management issues. In April 2006, the HBMWD completed a GWMP for the Mad River Valley groundwater basin to improve understanding of the basin hydrology and interaction between Ranney collectors during pumping. The HBMWD GWMP study area did not include the Dows Prairie groundwater basin, for which very little information currently exists. The MCSD intends to develop and adopt a local GWMP for the Dows Prairie groundwater basin once funding resources are provided through the State of California's Proposition 84 grant program.

The primary objectives for the project include:

- Improved understanding of the groundwater basin hydrogeology,
- Assessment of current groundwater conditions,
- Identification of data gaps and areas of concern,
- Development of a GWMP for adoption,
- Identify programs for monitoring and protection of groundwater resources, and
- Ensuring long-term groundwater availability and evaluating potential future uses

For the MCSD to achieve these objectives, a series of steps will need to be completed in order to address each objective for development and implementation of the GWMP. A general description of tasks is provided in this section with a more detailed description provided in later sections of this work plan.

For improved understanding of the Dows Prairie hydrogeology, the installation of soil borings and geophysical logging will be conducted. Monitoring wells will then be installed to enable groundwater elevation measurements and to facilitate groundwater sample collection to assess water quality. From this information, a Basin Conceptual Model (BCM) can start to be developed in order to identify data gaps and potential areas of concern. Information will also be used to help develop the GWMP and determine the BMOs by establishing criteria for future monitoring programs to evaluate and protect resources of the groundwater basin.

Development of the GWMP and evaluation of data gaps will enable MCSD to design a monitoring program for the Dows Prairie groundwater basin. Identification of constituents of concern and protocols to be used during evaluation of water quality issues as it relates to contaminant migration, groundwater extraction, saline water intrusion and recharge.

As new information is obtained through monitoring and additional studies, the GWMP will continue to be updated to allow for implementation of plans, initiatives, and public education to ensure long-term protection and availability of groundwater resources. The GWMP will contain milestones and be refined over time to reflect progress and new information towards BMOs once determined. The GWMP will additionally include mechanisms to assess progress towards achieving objectives and evaluating program effectiveness.

Public and Agency Review Process Participation

All local agencies, interested parties, and the general public will be invited to participate in the public review process, including providing input at the newly formed McKinleyville Municipal Advisory Committee's meetings and MCSD Board meetings. Copies of the review Draft will also be transmitted to both local and State governmental agencies for their review and consideration. The MCSD will actively seek public and agency input on the proposed GWMP.

In order to assure orderly progress is achieved on the implementation of the project, there will be ongoing advisory committee review by the McKinleyville Municipal Advisory Committee of work products, and submittal of both quarterly and final progress reports to the State. Peer review of the draft GWMP will also be incorporated with the solicitation of input from local and regional water agencies as well as interested local parties. The MCSD's timeline for preparation, review and adoption of its local GWMP is within 20 months elapsed time from project initiation.

Project information consisting of periodic updates, testing results, areas of progress and major milestones will be available to the public through postings on the MCSD website. In addition, the schedule of implementation and notification of GWMP upcoming meetings will be available through the website posting process.

Background

The MCSD has conducted a review of available literature in order to assess hydrogeologic conditions in the Dows Prairie groundwater basin area. The review included sources and agencies such as the California Department of Water Resources (DWR), Department of Interior, U.S. Geological Survey Maps, topographic quadrangle maps from the U.S. Department of Interior Geological Survey, completed reports, and individuals' familiar with subsurface conditions in this area. Primary data gaps currently identified include:

- Aquifers characteristics (storage capacity and potential yield)
- Impacts of land use on groundwater quality,
- Recharge and surface water interaction, and
- Availability of groundwater as a water source

In order to better understand hydrogeologic conditions in the Dows Prairie area, the MCSD is proposing to complete drilling operations, geophysical logging, and installation of test wells for monitoring purposes. Numerous sites have been evaluated for use as potential test well location within the District's boundaries. However, geology of the Dows Prairie area and the presence of a suitable water-bearing zone have focused the study area to the northern portions of Dows Prairie. As shown in the geologic cross section of the McKinleyville area (Figure 3), the underlying Franciscan Formation (non water bearing unit) is dipping to the north, subsequently the Hookton Formation (water-bearing unit) increases in thickness to the north.

Three potential sites spatially distributed have been identified within the Dows Prairie groundwater basing for drilling and well installation activities. Two of the locations are currently owned by the MCSD (Silverado Road and Pierson Park) and the third location is owned by the Simpson Timber Company (Mather Tract). For the Mather Tract site, an access agreement has been negotiated between Simpson Timber Company and the MCSD to conduct drilling and well testing activities (Access Agreement included).

Reliable Water Source

In order for the MCSD to assure an adequate water supply for both fire suppression / storage capacity and future growth in the McKinleyville area, locating a secondary water supply source is an additional focus of the groundwater program with this project. In the event of a natural disaster, the possibility exists that disruption will occur to MCSD's primary source of water supply, leaving it without adequate emergency water resources for its residential and business customers. The MCSD would benefit greatly from better understanding of the groundwater basin and if it can successfully develop a secondary source of water supply for its service area.

CEQA

The project is anticipated to require minimal California Environmental Quality Act (CEQA) documentation for the well installation/testing and study preparation of the local GWMP. CEQA compliance will be listed as a Work Scope item in the budget. A project CEQA checklist

will be prepared with a recommended clearance finding. The only known project permits required will be a County of Humboldt permit for drilling and well installation and for Mather track grading activities. The timeline for acquiring the County permit is anticipated to be 2-3 months, with the CEQA documentation and review for the project requiring 4-6 months time.

The MCSD does not anticipate any significant issues or problems in obtaining CEQA clearance for this project, within a very reasonable time frame. Upon receipt of a grant award, the applicant is prepared to commence work on the CEQA and submit same to the County of Humboldt for their review and approval. All anticipated CEQA analysis and documentation will be covered in a line item within the budget document. CEQA clearance findings for the local Groundwater Management Plan will also be covered as a separate item within the budget. Project permit submittals are included in the work plan, schedule, and budget documents.

Project Implementation

MCSD will oversee all subcontractors, services and equipment necessary for the described work, including subcontractor coordination and corresponding with regulatory agencies. A well installation permit for each location will be required from the Humboldt County Division of Environmental Health (HCDEH) which will include submittal of the permit application and fee.

Site Preparation

The Mather Tract site is the only location that will require any significant efforts for access. The road adjacent to the site is not suitable for vehicle access and will require minor grading to be completed. Clearing of vegetation and grading for a drilling pad will also be completed as part of site preparation activities, in addition to a mud pit for drilling fluids. Upon completion of site preparation activities, equipment and personnel will be mobilized to the site for conducting field program activities.

Drilling Operations

One soil boring is proposed to be completed at each site using mud rotary drilling methodology. The proposed drilling depth of the soil boring is estimated to be between approximately 200 to 300 feet Below Ground Surface (BGS). If the Franciscan formation is encountered prior to the proposed target depth, the boring will be advanced 15 feet into the formation for confirmation and drilling will be stopped.

Geophysical Logging

In order to gain a better understanding of subsurface stratigraphy and for well construction design, geophysical logging will be completed at each location to record and analyze measurements of physical properties. Logging tools proposed to be used will include caliper (boring diameter), gamma (clay content), single point resistance (grain size), and spontaneous potential (lithology and water quality). The geophysical logging will help identify different

hydrogeologic units in the subsurface and their ability to store and transmit groundwater. This information will enable proper placement of the casing and wells screen during construction.

Well Installation

For each test well construction, 5-inch diameter PVC casing and screen is proposed to be used. The length of the well screen interval will be determined from the information obtained during drilling and geophysical logging activities. Upon placement of the well casing and screen, filter pack (sand) will be placed in the annular space of the boring along the entire screened interval. Bentonite chips will be placed on the top of the sand pack and a sanitary seal consisting of low alkali cement will be placed by tremmie pipe within the annular space. The sanitary seal will extend from the ground surface to a minimum depth of 75 feet from ground surface. Well completions will include construction of a concrete pad with stove pipe protective casings at the surface to protect the well head

Well Development

Following well installation activities and allowing sufficient time for the sanitary seal to set up, development of the new well will be completed. This process will remove fluids and particles associated with drilling operations and helps increase the filter pack efficiently. Well development methods will be used according to field conditions encountered and may include pumping, surging, bailing and compressed air.

Groundwater Sample Analysis

Upon completion of well development, the well will be properly purged and a water sample will be collected and submitted to a state certified analytical laboratory for testing according to parameters consistent with California Drinking Water Standards. Based on the results of the initial groundwater testing, the wells will be sampled a second time during the monitoring period for specific parameters identified as potential constituents of concern.

Field Program Report

A report will be completed summarizing all field activities and the results of program testing (geophysical logging and water quality analysis). The report will include a discussion of findings for the initial hydrogeologic assessment and interpretation of findings which will be used as baseline support to develop the basin conceptual model and GWMP. A database will be established by the MCSD to store information generated during the field program and any future data generated from monitoring and additional studies. The MCSD will make available its groundwater assessment report findings and draft GWMP for public review via the internet, at the local area libraries, at its offices, and will conduct several public information workshops through its Municipal advisory committee on the Draft GWMP to obtain broad citizen input.