



DRAFT WORK PRODUCT



**Borrego Valley Groundwater Basin
Borrego Springs Subbasin**

**Groundwater Quality Optimization
Program**

Advisory Committee Meeting

May 31, 2018



DUDEK

The GSA is considering development of a Groundwater Quality Optimization Program for the Subbasin. The purpose of the program would be to mitigate existing and potential future sources of groundwater quality impairment in the Subbasin.

Groundwater Quality Optimization Program

2

Existing Impairment for potable supply:

Arsenic exceeds the drinking water maximum contaminant level (MCL) of 10 milligrams per liter (mg/L) in select wells the South Management Area.

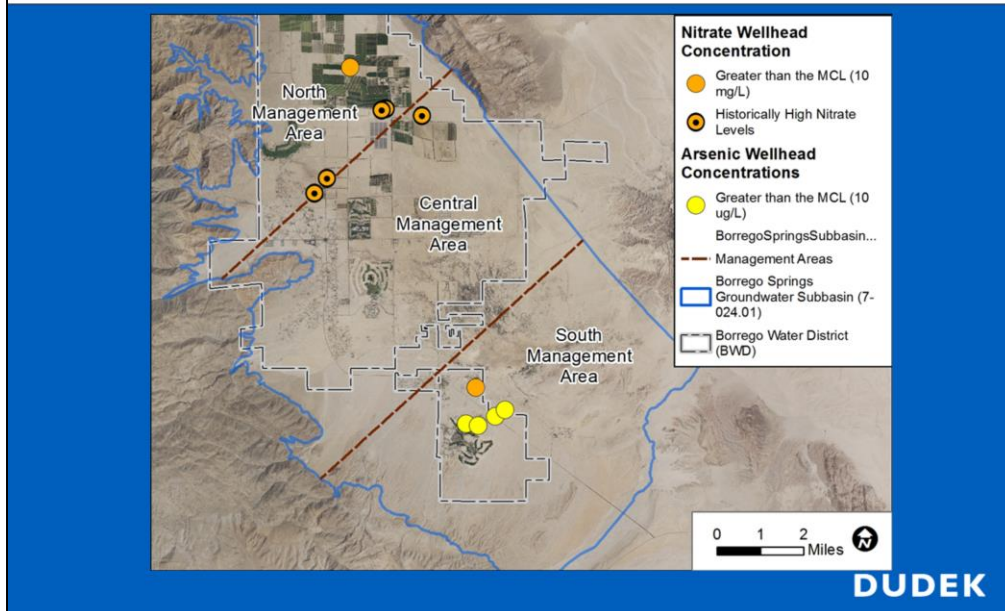
Nitrate is suspected to exceed the drinking water MCL of 10 mg/L (nitrate as nitrogen [N]) in portions of the North Management Area. Additional data is required to determine the spatial distribution of nitrate concentration in the North Management Area.

DUDEK

Due to the critical overdraft status of the Subbasin, the primary emphasis of sustainability efforts has been focused on addressing chronic lowering of groundwater levels. However, addressing degradation of water quality is imperative to making the best use of available water resources. Based on available data:

Arsenic exceeds the drinking water maximum contaminant level (MCL) of 10 milligrams per liter (mg/L) in select wells the South Management Area; and nitrate is suspected to exceed the drinking water MCL of 10 mg/L (nitrate as nitrogen [N]) in portions of the North Management Area.

Existing Groundwater Quality Impacts



The orange circles represent recent groundwater samples that exceed the drinking water maximum contaminant level (MCL) for nitrate of 10 milligrams per liter (mg/L) as nitrogen [as N] based on recent sampling. The orange circles with dots represent historically high nitrate concentrations typically detected in the uppermost portion of the upper aquifer near the water table at the time of sampling. Some of the nitrate exceedances date back to the late 1950's. Additional data is required to further characterize the horizontal and vertical distribution of nitrate in the North Management Area and potentially other areas in the Borrego Springs Groundwater Subbasin (Subbasin). As previously presented, elevated nitrate in the South Management Area is confined to one well located adjacent to the Waste Water Treatment Plant evaporation/infiltration basins.

The yellow circles represent recent groundwater samples that exceed the drinking water MCL for arsenic of 10 mg/L. Elevated arsenic appears to be confined to wells screened in predominantly the lower aquifer in the South Management Area. To date, elevated arsenic has not been detected in other areas of the Subbasin.

Groundwater Quality Optimization Program – Development Approach

4

1. Investigation to identify the sources, nature, and extent of groundwater quality impacts.
2. Development of opportunities and constraints analysis to optimize use of impaired water quality for suitable beneficial use (e.g. use groundwater impacted with arsenic and nitrate for irrigation).
3. Develop preliminary engineering evaluation of projects to mitigate water quality impairment and determine recommended projects (Cost/ Benefit)
4. Detailed project-specific preparation of plans and specifications
5. Implementation of groundwater quality mitigation projects

DUDEK

The Groundwater Quality Optimization Program should include five general phases: 1) investigation to identify the sources, nature, and extent of existing and potential future groundwater quality impacts; 2) development of an opportunities and constraints analysis to optimize use of impaired water quality for suitable beneficial use (e.g. use groundwater impacted with arsenic and nitrate for use as irrigation supply) ; 3) develop preliminary engineering evaluation of projects to mitigate water quality impairment and determine recommended projects including contingency plan should potable water wells exceed drinking water standards 4) detailed project-specific preparation of plans and specifications, and 5) implementation of groundwater quality mitigation.

This evaluation will include identification of multiple beneficial users and uses of water supply and the associated water quality considerations and demand for each beneficial use. For example, while groundwater quality elevated in arsenic and nitrate above drinking water maximum contaminant levels (MCLs) is not suitable for domestic and municipal supply without treatment, it is suitable for other beneficial uses such as for agricultural or recreation supply. As such, specific water quality types could be matched with specific suitable beneficial uses. An opportunities and constraints analysis will evaluate expected water demand by sector over a 20-year timeframe to develop a list of potential projects that require preliminary engineering evaluation. The preliminary engineering evaluation will include development to probable cost to allow for competitive cost/ benefit analysis of the selected projects. Detailed project-specific plans and specifications will be prepared for the competitively selected projects that maximize benefit to achieving Subbasin sustainability.