

SUSTAINABILITY INDICATOR: GROUNDWATER QUALITY

WHAT IT MEANS FOR SIERRA VALLEY

Groundwater quality in the Sierra Valley Basin is one indicator of groundwater conditions. Water quality includes the physical, biological, chemical, and radiological quality of water. Groundwater quality can be impacted by natural conditions (like thermal waters or hot springs), or man-made conditions (like landfills and land uses). Chemicals commonly found in groundwater include calcium, magnesium, sodium, potassium, chloride, bicarbonate and sulfate. Any constituent that becomes a concern for ecosystem health, human consumption, industrial, commercial, or agricultural uses is considered a “pollutant” or “contaminant.” Groundwater quality is important because contamination can affect the quantity and availability of groundwater for domestic, municipal, agricultural and other uses.

As part of the GSP process, groundwater quality throughout Sierra Valley is being compared to regulatory standards (see table below). Concentrations that regularly exceed regulatory standards are being examined more closely. If a concentration is deemed problematic or potentially problematic, monitoring of the chemical will be conducted to track the constituent’s levels in groundwater.

CURRENT GROUNDWATER QUALITY CONDITIONS IN SIERRA VALLEY

Groundwater in the Basin is generally of good quality and meets local needs for municipal, domestic, and agricultural uses. Data show that some constituents, including TDS, boron, arsenic, and manganese exceed regulatory standards in parts of the Basin. Exceedances, particularly in the central west side of the Basin where fault-associated thermal waters and hot springs exist, may be caused by localized conditions and may not be reflective of regional water quality.

Constituents mentioned in previous reports and/or during stakeholder meetings are being evaluated as part of the GSP process: nitrate, total dissolved solids (TDS), arsenic, boron, pH, iron, manganese, and MTBE.

For each constituent, the analysis involved two steps: 1) mapping the location of wells where concentrations above regulatory standards have been measured; and, 2) graphing measured concentrations over time and comparing to regulatory standards. This provides an understanding of groundwater quality around the Basin and how groundwater quality changes over time. Examples for TDS and nitrate are provided to the right.

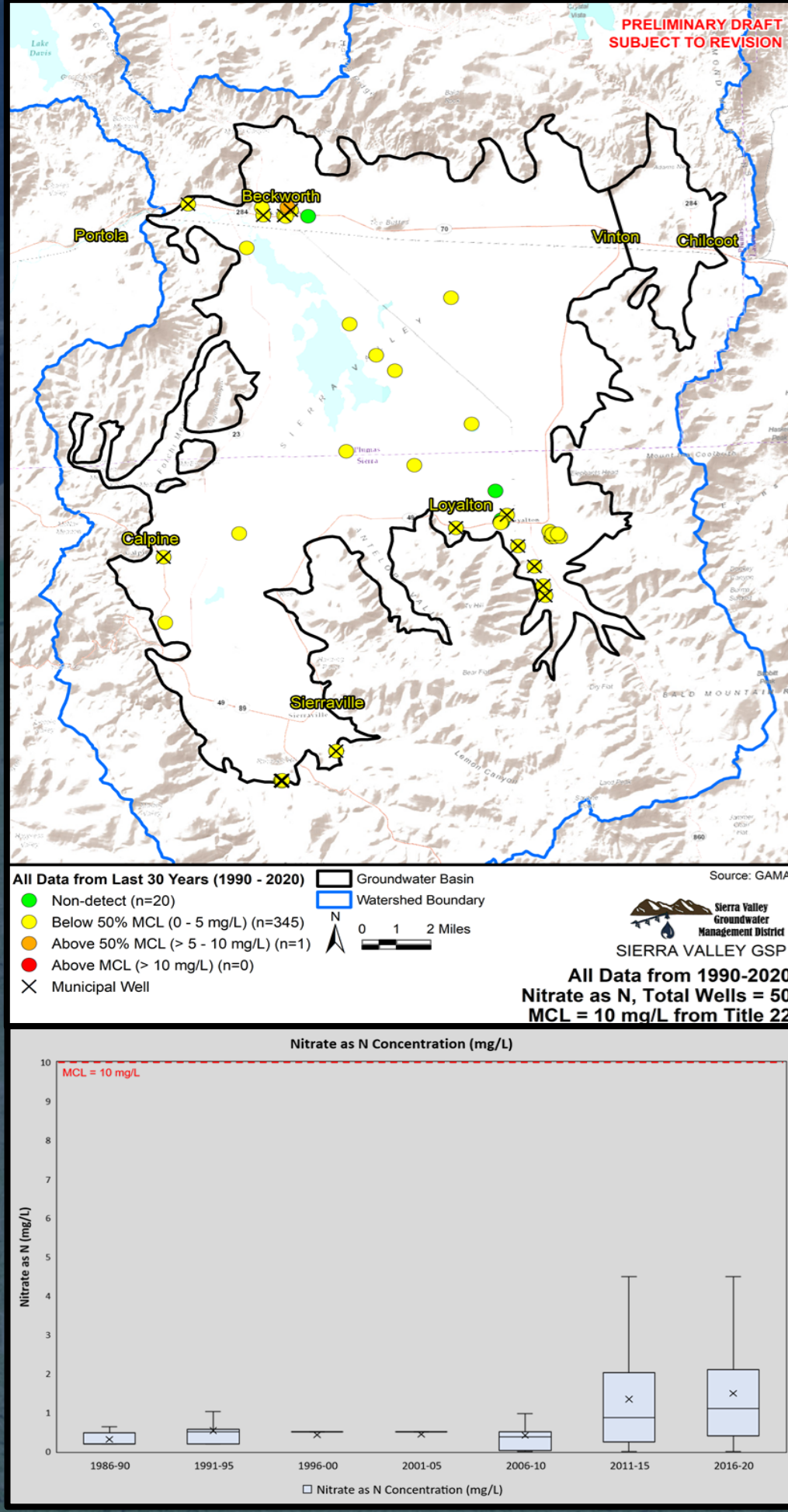
REGULATORY STANDARDS

Constituent (units)	Regulatory Standard
Arsenic (µg/L)	10
Boron (mg/L)	1.0
Iron (µg/L)	300
Manganese (µg/L)	50
MTBE (µg/L)	13
Nitrate (mg/L as N)	10
pH	7.0 – 8.5
Total Dissolved Solids (mg/L)	500

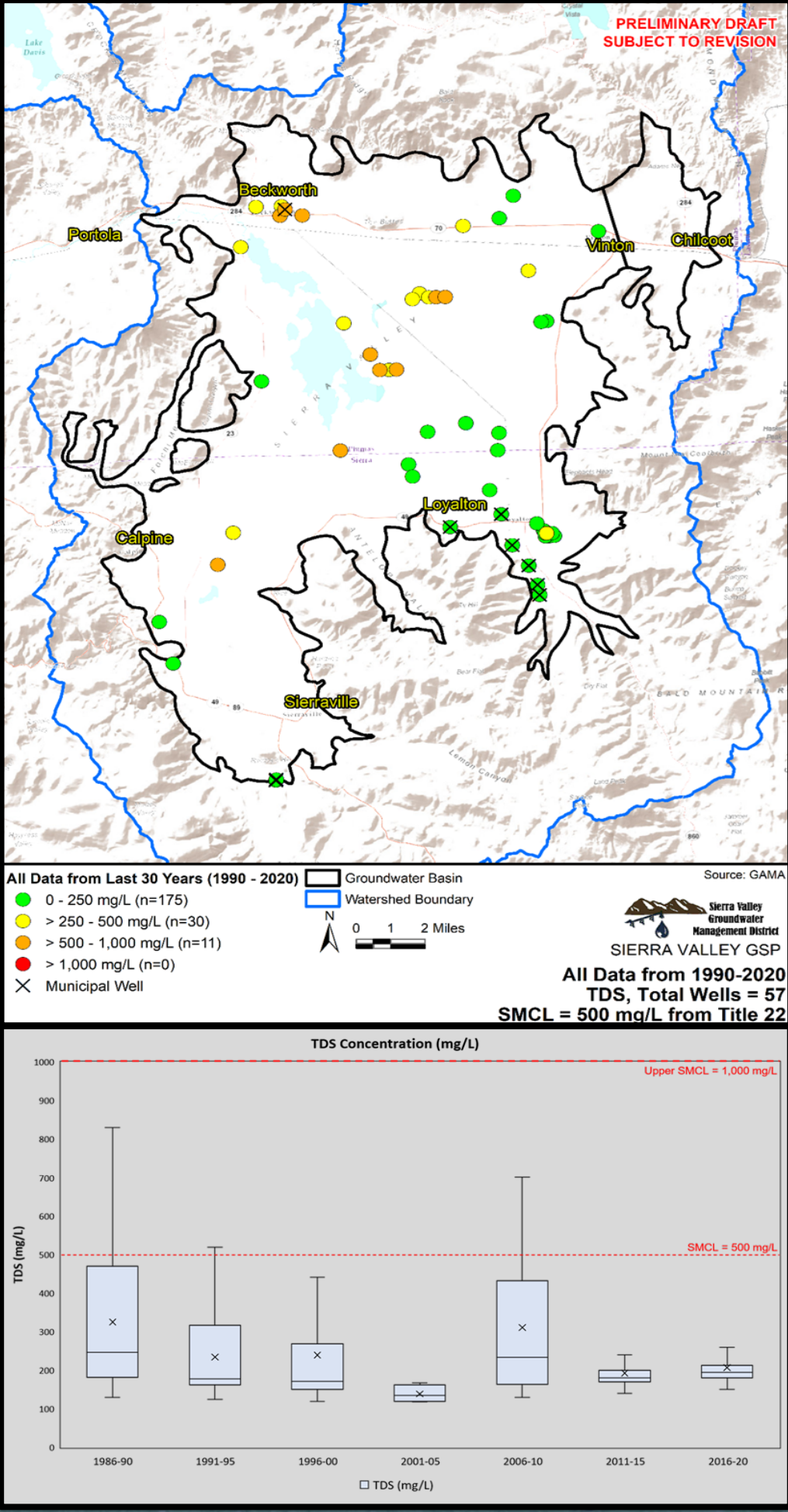
HYPOTHETICAL TRENDS



NITRATE

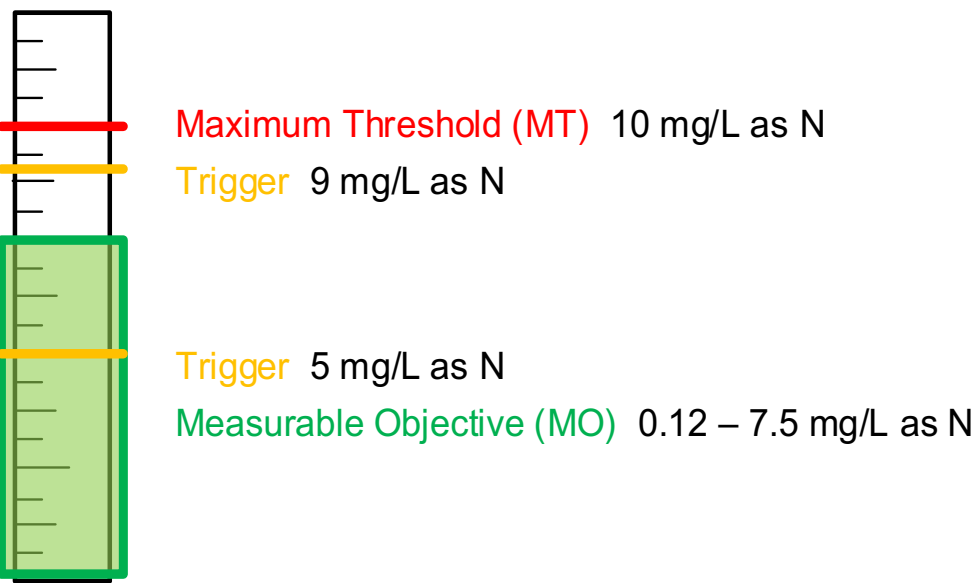


TDS

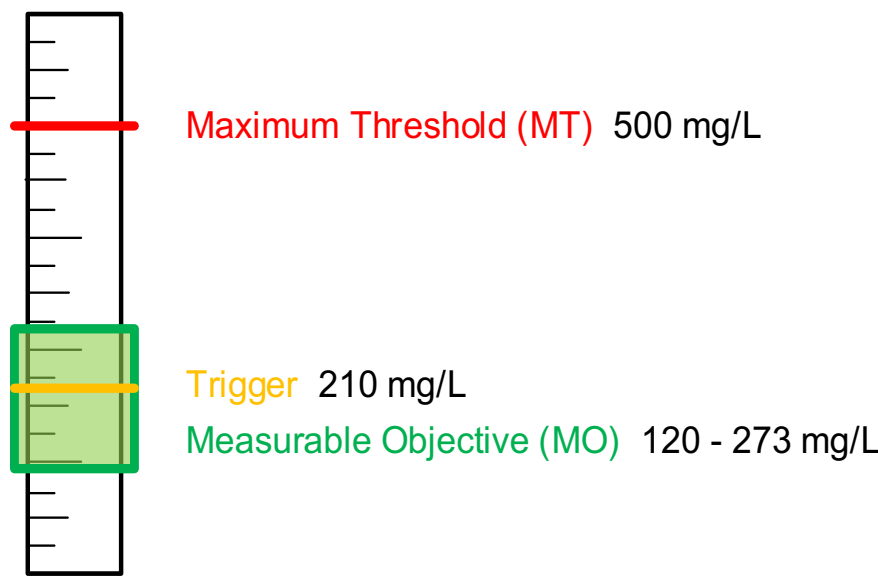


PROPOSED SMC

NITRATE



TDS



PROPOSED SUSTAINABLE MANAGEMENT CRITERIA (SMC)

“Significant and unreasonable” degradation of groundwater quality is the degradation of water quality that would impair beneficial uses of groundwater or result in failure to comply with groundwater regulations. **Maximum Thresholds (MTs)** are the concentrations of constituents which are likely to produce “undesirable results”. Maximum thresholds have been defined for two constituents in the Basin: Nitrate and TDS. The GSP also defines “triggers”, concentrations that don’t exceed the Maximum Thresholds that signal the need for action to proactively avoid undesirable results. **Measurable Objectives (MOs)** define the constituent levels in groundwater quality that protect beneficial uses and users. The “rulers” above show MTs and MOs for nitrate and TDS.

APPROACHES TO ADDRESSING UNDESIRABLE RESULTS

Monitoring networks will be developed to track levels of Nitrate and TDS compared to the MTs and MOs shown above. The GSAs will monitor arsenic, boron, and pH to track any possible mobilization of elevated concentrations. Should triggers be exceeded, the GSAs will investigate the cause and sources and implement management actions such as outreach to stakeholders, relocation of groundwater recharge projects and coordination with the appropriate regulatory agency.

WHAT DO YOU THINK...

What concerns you most about groundwater quality in the Sierra Valley?
Do you have a well you would allow to be monitored for groundwater quality?

GSAs:

