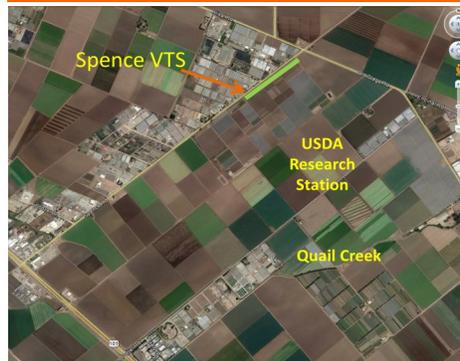


# Spence Vegetated Treatment System

## Description

The Spence Vegetated Treatment System (VTS) is an 1800-ft long ditch vegetated with native grass (*festuca rubra*) that intercepts runoff from 86 acres of farm fields, removing nutrients and other pollutants. Sediment ponds at the field edges capture large sand particles and then culverts transport water under the farm roads, emptying into a bed of rocks. Dense grass in the VTS slows the flow of run-off, settling out fine sediment. Plants uptake nutrients and also reduce the volume of run-off by increasing infiltration and evapotranspiration losses. During heavy storm events the vegetation prevents soil erosion. When sufficient run-off drains to the lowest end of the VTS, this water is collected in a sump and reapplied to the sides of the ditch using drip tape, thus maintaining the grass through the dry season and increasing the treatment surface area. During summer irrigation in 2016, all runoff was infiltrated prior to reaching the outlet.

## PROJECT LOCATION



The Spence Vegetated Treatment System (VTS) is located at USDA Agricultural Research Station in the Quail Creek watershed south of Salinas. Quail Creek is 303(d) listed for ammonia and nitrate. The impaired beneficial use is drinking water and the goal is a 65% nitrate load reduction.

## Load Reduction

Midpoint sampling over a distance of 615 feet (35% of the VTS) showed a concentration reduction in nitrate of 73% and sediment of 69% during summer irrigation on 7/26/16. Othophosphate removal over the course of the project was variable. Because all water was infiltrated, we surmised total removal of pollutants of 100%.

## Demonstration Site

The VTS is used as a demonstration site for researchers, agricultural professionals and growers interested in nutrient and pesticide removal by vegetated ditches. UC Davis Granite Canyon Lab tested and demonstrated methods for organophosphate and neonicotinoid pesticide removal. UCCE demonstrated nutrient removal and small-seeded grass that does not provide rodent or bird habitat. The use of CropManage for irrigation water and nutrient application has resulted in low to no runoff during the irrigation season with complete infiltration of any field runoff within the VTS (except during storms).

## Partnerships

UCCE provided the conceptual design and outreach to user groups. RCD Monterey County provided the technical design, and the USDA Agricultural Research Station provided the location and earth movement for the sediment basins. The project was funded by SWRCB Prop 84 grant #12-414-553.

## Prop 84 Grant Funding

State Water Resources Control Board's Proposition 84 Agricultural Water Quality grant paid for culverts, monitoring equipment, sediment basins, plant establishment and irrigation. The ditch had been previously constructed. Matching funds were provided from UCCE as professional services.

**Construction Costs \$40,600**  
**Land \$45,000**

## FOR MORE INFORMATION

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Date	Flow Rate m3/sec	Load Reduction Percent	Nitrate as N g/hr	Othophospha te as P g/hr	Total Susp. Solids g/hr
7/26/2016	0.00136	100%	16.13	0.98	1486.27
8/2/2016	0.00180	100%	nt	2.72	485.99

## Culvert Outlet to VTS Ditch



## Culvert Inlet from Sediment Basin

