

Soil Properties and Characteristics Altered Due to Construction of Functional Vernal Pools

COOK Terry D.¹, ARMSTRONG Ed², BURNS David², CARLETON Christian², O'BLENESS Sandy², WHITNEY Kenneth D.²

¹*soil consultant*

²Foothill Associates

Abstract:

In the Sacramento Valley, naturally occurring vernal pools are typically found on very old terraces with restricting claypans and/or duripans (hardpans) that have been dated from 30,000 to more than 500,000 years old. These depressional seasonal wetlands are regulated by the Clean Water Act. One method to compensate for the loss of these wetlands is to construct new vernal pools that replicate natural functions. Identifying appropriate soil types and their respective landscapes, especially in soils leveled for agriculture, are critical to successfully constructing or restoring vernal pools. These soil factors are instrumental in the design process, development of vernal pool construction plans, and the implementation of such plans. This poster details landscape characteristics and soil properties of pre-construction soil pits used to guide the conceptual design of constructed vernal pools, as well as implementation. Additional soil pits dug during construction were utilized in the final design and implementation of 327 vernal pools on about 80 hectares of irrigated pasture in southeastern Sacramento County, CA. Models depicting natural and altered soils and landscapes at the mitigation site are provided to illustrate the relationships of the depth of restricting layers -- i.e., claypans and/or duripans (hardpans) -- to constructed vernal pools. Establishment of the proper relationship between the vernal pool bottom and the restricting layer is a critical step in successfully restoring this at-risk wetland habitat. Development and mitigation are drastically altering natural agricultural landscapes in the Sacramento Valley, CA

Keywords: vernal pools, wetlands, mitigation, altered soils

Topic: B. Impacts of urbanization on soil resources

Sub-topic: B3. Physical aspects of urban soil changes

Presentation type: Poster

Information of corresponding author

Full Name: Terry D. Cook

Organization: [*soil consultant*]

Mailing address: 3214 Lillard Drive, Davis, CA 95618 USA

Tel: 00 1 530-753-1062

E-mail: IntlSoils@aol.com