Draft Problem Statement
Squaw Creek Sediment TMDL

OVERVIEW

Section 305(b) of the Clean Water Act (CWA) mandates assessment of the nation's water resources, and these water quality assessments are used to identify and list those waters that are not achieving water quality standards established to protect beneficial uses. The resulting list is referred to as the 303(d) list. The CWA also requires states to establish a priority ranking for these impaired waters and to develop and implement TMDLs. A TMDL specifies the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards, and it allocates pollutant loads from point and non-point sources such that those standards will be met. Squaw Creek is included on California's CWA Section 303(d) list as water quality limited due to sedimentation/siltation with a high priority ranking.

PROJECT AREA DESCRIPTION

Physical Setting

The Squaw Creek watershed is located six miles northwest of Lake Tahoe in Placer County, between the towns of Tahoe City and Truckee. It encompasses about 7.9 square miles of glaciated topography ranging in elevation from 9,006 ft. at the top of Granite Chief to 6,120 ft. at the confluence of Squaw Creek and the Truckee River. Squaw Creek includes a north and south fork that join at the valley floor at an elevation of about 6,220 ft. Both forks have steep gradients and bedrock-controlled channels. The creek is channelized from the confluence of the two forks for a distance of a half mile downstream and often flows subsurface through this section in periods of summer low-flow. From this point to the terminal moraine that defines the downstream end of the valley, Squaw Creek meanders across the alluvial valley. From the terminal moraine to the creek's confluence with the Truckee, it follows a steeper, stable boulder-controlled gradient.

Geology and Climate

The geology is common to the Central Sierra Nevada, with four major lithologic units: metamorphosed sediments of the lower Jurassic, various granitic types of Cretaceous age, Piocene basalts, and pyroclastics. Soils reflect the parent material, climate and quaternary glaciation. The granitics weather to sand, gravel and cobbles, while the basalts and pyroclastics weather to silts, clays, blocks and chips. Geomorphic processes also reflect recent glaciation, a variable climate, land use and faulting. Mud and debris flows are common to the steep slopes.

The climate is highly variable, characterized by frequent floods and droughts. Precipitation comes primarily in the winter months as snow. Peak flows are associated with spring snow melt, although rain-on snow events in the winter and early spring can produce dramatic peaks. Vegetation consists of mixed coniferous forest, red fir forest, subalpine forest, montane meadow, alpine meadow, alpine rock communities, and montane chaparral.

Land and Water Use
During the late 1800s, cattle ranching, sheep herding, farming and logging supported a small community. Through the next half century, use declined to sporadic summer grazing of sheep and cattle. It is likely that logging continued throughout this time period. Little activity occurred until the construction of the first ski lifts in the valley in 1949.

In preparation for the 1960 Winter Olympics at Squaw Valley, the Army Corps of Engineers channelized Squaw Creek through the western end of the valley and placed culverts in the south fork of Squaw Creek through the Olympic facilities area. These treatments are still in place today. The western end of the meadow was cleared of vegetation and graded for parking and access roads. Numerous ditches were constructed to drain the meadow and prepare the area for parking use.

Beginning in the late 1950s, the north slopes of Squaw Valley were subdivided for single family homes. Present uses in the valley include residential, hotel lodging, and commercial development. The Squaw Valley USA ski resort occupies much of the south fork drainage and the western end of the valley. Recreational, commercial and residential development has accelerated in recent years, and small private timber sales continue on the forested slopes of the valley. Land ownership in the valley is largely private with public ownership limited to Forest Service land in the north fork, Shirley Canyon area. Logging roads, residential development, trails, ski resort access roads and ski runs have altered natural surface drainage patterns and increased the potential for sediment transport into Squaw Creek.

Municipal water supplies are drawn primarily from wells within the valley-fill aquifer, and the south fork of Squaw Creek is impounded in Gold Coast pond to supply water for snowmaking. All sewage is exported from the valley.

303(d) LISTING BASIS

Beneficial Uses
Squaw Creek and Squaw Valley Meadow Wetlands collectively support the following beneficial uses defined in the Basin Plan:

- Municipal and Domestic Water Supply (MUN);
- Agricultural Water Supply (AGR);
- Groundwater Recharge (GWR);
- Water Contact Recreation (REC-1);
- Non-contact Water Recreation (REC-2);
- Commercial and Sports Fishing (COMM);
- Cold Freshwater Habitat (COLD);
- Wildlife Habitat (WILD);
- Rare, Threatened, or Endangered Species (RARE);
- Migration of Aquatic Organisms (MIGR);

- Spawning, Reproduction and Development (SPWN);
- Water Quality Enhancement (WQE); and
- Flood Peak Attenuation/Flood Water Storage (FLD)

Water Quality Standards

The Water Quality Control Plan for the Lahontan Basin (Basin Plan) includes certain narrative and numeric Water Quality Objectives (WQOs) for surface waters throughout the Lahontan Region. For Squaw Creek, WQOs related to excessive sedimentation/siltation include the following narrative and numeric standards:

- non-degradation objective (Basin Plan page 3-2);
- sediment (Basin Plan page 3-6);
- settleable materials (Basin Plan page 3-6);
- suspended materials (Basin Plan page 3-6); and
- turbidity (Basin Plan page 3-7).

Beneficial Use Impairment

There has been an increase in sediment, settleable and suspended materials, and turbidity in the creek with increased watershed disturbance, causing degradation of water quality and causing Squaw Creek to fail to meet its WQOs. Scientific reports, unpublished data collected by Regional Board staff, complaint driven sampling, and violations detected through permitted self-monitoring programs are the basis for Squaw Creek's listing as impaired by sediment. An example of information that supports the 303(d) listing of Squaw Creek includes studies detailing evidence that much more sediment is produced and transported through the Squaw Creek watershed than would normally be expected for a watershed of its characteristics. There also have been numerous complaints regarding the aesthetic and aquatic life concerns of turbid water in the creek.

SCHEDULE

Deliverable/Milestone	**Date**
Initiate project and begin evaluating existing data.	June 1999
Develop source assessment and bioassessment target contracts.	January 2000
Receive final reports from contractors	Summer 2002
Complete technical TMDL	March 2004
Submit final TMDL to EPA for approval	June 2005

CONTACT INFORMATION

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