

## 8 SUSTAINABLE MANAGEMENT CRITERIA

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### 8.8 Depletion of Interconnected Surface Water SMC

#### 8.8.1 Locally Defined Significant and Unreasonable Conditions

The two manifestations of depletion of interconnected surface water are reduced surface flow in streams and a lowering of the water table next to streams. The potential effects of depletion on beneficial uses of surface water and groundwater in the Subbasin are:

- Reduction in Salinas River outflow that decreases groundwater recharge in the Salinas Valley,
- Reduction in the extent, density, and health of riparian vegetation and animal species that use riparian habitat, and
- Reduction in passage opportunity for steelhead trout.

Each of these issues was considered in setting sustainable management criteria for interconnected surface water. In the case of habitat uses, the basis for the SMCs relies on the quantitative evaluation of groundwater effects on habitat presented in GSP Section 5.5.

#### 8.8.2 Minimum Thresholds

The minimum threshold for interconnected surface water is a decline in the alluvial water table elevation as measured at Alluvial Aquifer RMS wells in the spring measurement round along the Salinas River, middle reach of the Estrella River (from Shedd Canyon to Martingale Circle) or San Juan Creek upstream of Spring Creek that is 1) likely caused by groundwater pumping in the Paso Robles Formation Aquifer, 2) is more than 10 feet below the spring 2017 elevation, 3) persists for more than two consecutive years, and 4) occurs along more than 15 percent of the length of any of the three stream reaches. It is noted that the potential connection along the Salinas River is between the surface water system and the adjacent alluvial deposits. There is no evidence that the Salinas River surface water flows are connected to the underlying Paso Robles Formation Aquifer. The potential connection between the surface water system along the middle reach of the Estrella River (from Shedd Canyon to Martingale Circle) and along San Juan Creek upstream of Spring Creek, and the underlying Paso Robles Formation Aquifer is unknown but sufficient evidence exists that there could potentially be a connection, and therefore further investigation in these areas is recommended.

SGMA regulations specify that the minimum threshold for interconnected surface water shall be defined as “the rate or volume of surface water depletions caused by groundwater use that has adverse impacts on beneficial uses of the surface water and may lead to undesirable

results” (Regulations «354.28(c)(6)). However, the regulations also allow the use of groundwater elevations as a reasonable proxy for the rate of flow depletion if such approach is “supported by adequate evidence” (Regulations «354.28(d)). In the Paso Robles Subbasin, depth to water is a reasonable proxy because the resource most likely to be impacted is phreatophytic riparian vegetation, which is sensitive to depth to water but not to the rate of percolation. Also, analysis of potentially impacted beneficial uses that do depend on the rate of stream flow—downstream water users and steelhead trout migration—indicates that the likely magnitude of impact is negligibly small. Finally, from a practical standpoint, induced percolation from streams is difficult to measure, particularly if it is a small percentage of total flow and varies substantially from reach to reach along a stream.

There presently are too few Alluvial Aquifer monitoring wells along the middle reach of the Estrella River and the upper reach of San Juan Creek to evaluate the minimum threshold. For the first five years of GSP implementation, the minimum threshold will be evaluated only for the Salinas River reach. New monitoring wells will be installed along the Estrella River and San Juan Creek during that period (see Section 7.6.1), allowing the minimum threshold to be applied to those reaches in subsequent implementation periods.

### **8.8.3 Measurable Objectives**

Measurable objectives are specific, quantifiable goals for the maintenance or improvement of groundwater conditions. They represent a desirable condition with respect to interconnected surface water. With respect to riparian vegetation, the measurable objective is a five-year moving average of spring groundwater elevations in Alluvial Aquifer wells along the Salinas River, the middle reach of the Estrella River (from Shedd Canyon to Martingale Circle) and San Juan Creek upstream of Spring Creek that are no more than 5 feet below the spring 2017 groundwater elevations. This objective is expected to maintain the extent and density of riparian vegetation at the 2017 level. It would also maintain Salinas River outflow and steelhead passage opportunity at existing levels, at least as far as they are affected by depletion from groundwater pumping.

There presently are too few Alluvial Aquifer monitoring wells along the middle reach of the Estrella River and the upper reach of San Juan Creek to evaluate the measurable objective. For the first five years of GSP implementation, the measurable objective will be evaluated only for the Salinas River reach. New monitoring wells will be installed along the Estrella River and San Juan Creek during that period (see Section 7.6.1), allowing the measurable objective to be applied to those reaches in subsequent implementation periods.

## **8.8.4 Relationship of Minimum Threshold to Other Sustainability Indicators**

### **8.8.4.1 Groundwater Elevations**

The measurable objective and minimum threshold for interconnected surface water involve groundwater elevations in the Alluvial Aquifer. They do not conflict with the SMCs for Alluvial Aquifer groundwater elevations because those are not yet quantified (see Sections 8.4.3.3 and 8.4.4.2). The interconnected surface water SMCs could potentially be more restrictive than the SMCs for Paso Robles Formation Aquifer groundwater elevations if the latter would allow large declines in water table elevations along protected reaches of riparian vegetation. Specifically, the Paso Robles Formation Aquifer minimum threshold allows for 30 feet of additional water-level decline below the 2017 groundwater elevation.

### **8.8.4.2 Groundwater Storage**

Groundwater storage is inherently connected to groundwater levels. Based on the logic presented above for groundwater elevation SMCs, the interconnected surface water SMCs could potentially constrain temporary or sustained reductions in groundwater storage in some locations that would otherwise be allowed by the groundwater storage minimum threshold, which is defined as groundwater elevations averaged over the entire Subbasin that are above the groundwater elevation minimum threshold (see Section 8.5.2).

### **8.8.4.3 Subsidence**

Subsidence is not related to Alluvial Aquifer water levels because the Alluvial Aquifer is too thin and coarse-grained to experience significant compaction of clay layers due to 10 feet of water-level decline. Subsidence is a function of Paso Robles Formation Aquifer water levels, which are not directly involved in the interconnected surface water SMCs. To the extent that the interconnected surface water SMCs constrain the permissible amount of decline in Paso Robles Formation Aquifer water-levels, they decrease the risk of subsidence.

### **8.8.4.4 Water Quality**

The interconnected surface water SMCs would not affect groundwater gradients and recharge rates, and they would not introduce contaminants or cause changes in aquifer geochemistry. Thus, they would not affect the water quality SMCs.

## **8.8.5 Effect of SMCs on Neighboring Basins**

The mechanism by which the interconnected surface water SMCs could affect the Upper Valley Subbasin in the Salinas Valley (adjacent to and downstream of the Paso Robles Subbasin) would be by decreased groundwater recharge resulting from decreased flow in the

Salinas River. However, that effect would be negligibly small (see Section 8.9.7.1 under “Undesirable Results” below).

The interconnected surface water SMCs would not affect groundwater in the Atascadero Subbasin because any changes in Salinas River flow would not propagate upstream to that Subbasin. By maintaining GDEs in the Paso Robles Subbasin in good condition, the SMCs would support the regional maintenance of GDEs, especially animals that move up and down the river and riparian corridors.

### **8.8.6 Relationship of SMCs to Federal, State and Local Regulations**

The only federal, state or local regulation that directly applies to stream flow gains and losses is the “live stream” requirement imposed by the State Water Resources Control Board in the water rights permit for operating Salinas Dam upstream of the Subbasin. However, that requirement reflects a concern that changes in surface flow might impact groundwater availability, not the opposite, which is the concern here.

The state and federal endangered species acts protect animal species listed as threatened or endangered against “take”, which is to capture, harm, wound or kill the animal. Harm includes significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. The listed animals that appear to actually be present in the Subbasin and potentially vulnerable to depletion of interconnected surface water are steelhead trout and California red-legged frog. The SMCs for interconnected surface water are designed to sustain populations of GDE animals, including these listed species, at 2017 levels. This would avoid take.

### **8.8.7 Undesirable Results**

Undesirable results are adverse effects on beneficial users and uses of water that reach a magnitude considered significant and unreasonable. This section defines undesirable results for surface water users, riparian vegetation and fish passage. Generally, undesirable results are defined in terms of the percent of all interconnected surface water reaches that exceed the minimum threshold.

#### **8.8.7.1 Surface Water Users**

Decreased groundwater discharge to the Salinas River would be significant and unreasonable if it prevented groundwater users in the Salinas Valley—where groundwater is primarily recharged by Salinas River percolation—from continuing their existing, economically viable agricultural or urban uses of land. This is not expected to occur because of the combined effects of the groundwater storage and interconnected surface water SMCs. A decrease in

groundwater storage would be associated with lower groundwater elevations and decreased groundwater discharge to the Salinas River. The groundwater storage SMC allows for a reduction in storage to an amount associated with Paso Robles Formation Aquifer groundwater elevations 30 feet below 2017 groundwater elevations but does not allow further declines beyond that. Annual water budgets for 1981-2011 produced by the groundwater model show that groundwater discharge to the Salinas River is dominated by contributing flows from the alluvial deposits and clearly correlated with year type (it increases in wet years) but is not obviously correlated with changes in pumping and storage from the Paso Robles Formation Aquifer (see Figure 6-3), which are strongly correlated with each other (Figure 5-12). Average annual groundwater discharge to streams (7,400 AFY) equals about 1.5 percent of annual groundwater pumping downstream in the Salinas Valley. If pumping in the Paso Robles Subbasin were to change, its effect on groundwater discharge to the Salinas River would likely be small, and hence much less than 1.5 percent of downstream water use. This is because the connection along the Salinas River is between the surface water system and the adjacent alluvial deposits. There is no evidence that the Salinas River surface water flows are connected to the underlying Paso Robles Formation Aquifers. Furthermore, to achieve the groundwater level management objective it will be necessary to balance the Subbasin water budget, which means that groundwater pumping will not cause increased depletion of stream flow in the future. As stated in Section 6.5.1 “An overarching assumption is that any future increases in groundwater use within the Subbasin will be offset by equal reductions in groundwater use in other parts of the Subbasin, or in other words, groundwater use will remain neutral through implementation of the GSP.” In any event, the interconnected surface water minimum threshold would tend to restrict rather than increase the amount of future storage depletion and thus be more protective of Salinas River outflow and downstream users.

#### **8.8.7.2 Groundwater Dependent Vegetation**

The qualitative undesirable result for riparian vegetation is mortality. The minimum threshold definition for interconnected surface water specifies a quantitative depth and duration of low water table conditions that are considered likely to cause riparian tree stress and potential mortality, based on observed limited mortality patterns during 2013 to 2017<sup>1</sup>.

An exceedance of the minimum threshold at a single location would not necessarily be undesirable if riparian vegetation in other parts of the Subbasin remained in good condition. Regional ecological function would continue, and the locally impacted area would likely recover when the water table rises back to more normal elevations above the minimum threshold. However, widespread exceedance of the minimum threshold could impair regional ecological function and retard the recovery process. Accordingly, an undesirable result is

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<sup>1</sup> Results of a riparian vegetation EVI trend analysis indicate that riparian vegetation health has generally remained stable over the long term from January 2009 through present (see Section 5.5.3).

when water levels along more than 15 percent of the length of any of the three stream reaches with abundant riparian vegetation exceed the minimum threshold (defined in Section 8.9.3) as a result of groundwater pumping in the Paso Robles Formation Aquifer. The three reaches are the Salinas River from Paso Robles to the Subbasin boundary below San Miguel, the middle reach of the Estrella River (Shedd Canyon to Martingale Circle), and San Juan Creek upstream of Spring Creek.

### **8.8.7.3 Groundwater Dependent Animals**

Animals that depend on riparian vegetation are assumed to suffer population declines if the extent of riparian vegetation decreases and thus are implicitly covered by the SMCs and undesirable results for vegetation. The undesirable result for steelhead trout—which uses surface flow in the Salinas River for migration—is a long-term decrease in population as a result of flow depletion caused by groundwater pumping. As explained in section 5.5.10, groundwater pumping has little effect on passage opportunity. Because the SMCs for groundwater levels and storage preclude ongoing future increases in pumping or decreases in groundwater levels, undesirable results with respect to steelhead passage are not expected to occur.