

Introduction

Monitoring, Assessment, and Performance Measures

Introduction

Attachment 6 consists of the following items:

- ✓ **Monitoring, Assessment, and Performance Measures.** The purpose of this attachment is to describe the monitoring, assessment, and performance measures that will be used to evaluate the proposed projects. These measures will ensure that this proposal meets its intended goals, achieves measurable outcomes, and provides value to the Upper Santa Margarita (USMW) IRWM Region and the State of California.

The purpose of this attachment is to provide a discussion of the monitoring system to be used to verify project performance with respect to the project benefits or objectives identified. This attachment will identify data collection and analysis to be used by the proposed projects.

This attachment will also discuss how monitoring data will be used to measure the performance in meeting the overall goals and objectives of the USMW IRWM Plan. A Project Performance Measures Table has been prepared for each project, which includes the following:

- Project goals
- Desired outcomes
- Targets – measurable targets that are feasible to meet during the life of the Projects
- Performance indicators – measures to evaluate change that is a direct result of the Project being built
- Measurement tools and methods – to effectively track performance

The performance measures will continue to be refined as each of the projects continue to be developed. Upon receipt of grant funding, the Project Performance Measures Table for each of the projects will be utilized to develop a project monitoring plan. Project benefits are discussed in more detail in Attachments 7 and 8.

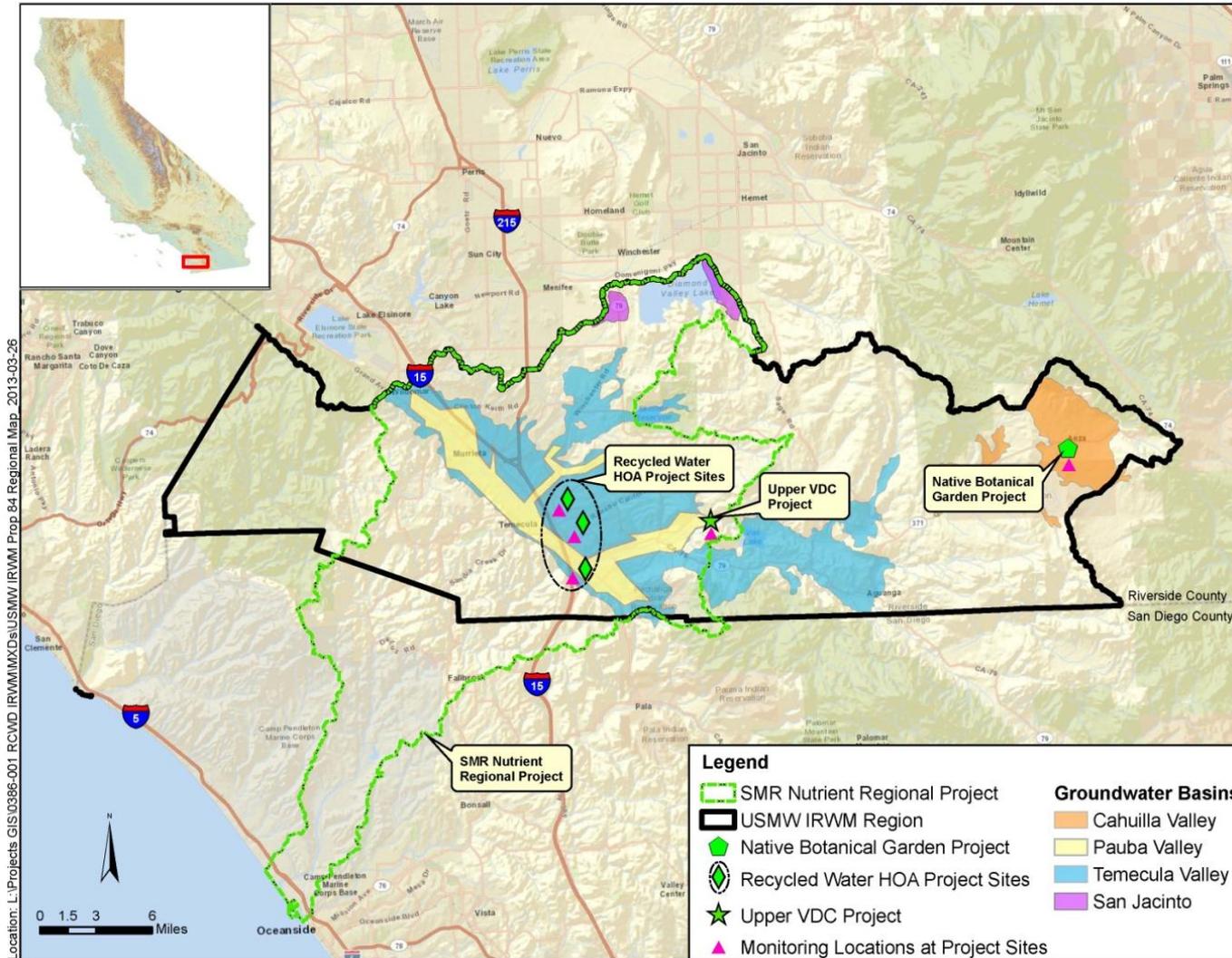
Figure 6-1 shows monitoring locations for the following projects:

- Recycled Water and Plant Material Conversion Project for HOA Common Areas (RWPMC) Project
- Native Botanical Garden Project
- Upper Valle de Los Caballos Recharge Project (Upper VDC) Project

Performance measure detail for the interregional project, *Implementing Nutrient Management in the Santa Margarita River Watershed – Phase II*, is included in the San Diego IRWM application.

Note that all project monitoring locations are located on the project's site.

Figure 6-1: Project Monitoring Locations



**Recycled Water and Plant Material Conversion
Project for HOA Common Areas****Monitoring, Assessment,
and Performance Measures****Recycled Water and Plant Material Conversion Project
for HOA Common Areas****Project Goals and Performance Measures**

The Recycled Water and Plant Material Conversion Project for Home Owner Association (HOA) Common Areas (RWPMC Project) will consist of a suite of activities that will reduce dependence on imported water and improve water supply reliability (through elimination of potable water use and efficient use of recycled water), improve water quality, promote water conservation, reduce energy consumption and reduce greenhouse gas (GHG) emissions. These activities will be executed in order to meet the Project goals (listed below). Progress on meeting quantifiable Project goals can be determined through implementation of performance measures that will be used to quantify and verify project performance. Some Project goals, however, are more difficult to measure since the benefits that they derive are qualitative in nature. The following is a discussion on all of the RWPMC Project goals and how the monitoring systems will be used to verify performance of the quantitative goals and benefits (those also described in Attachment 7). The goals and performance measures (summarized in **Table 6-1**) are consistent with the USMW IRWM Plan and Project objectives as described in Attachment 3.

Project Goal: Decrease total irrigation water demand at project sites

The Project will install efficient recycled water irrigation systems and drought tolerant plant materials to decrease the gross irrigation water usage required at all three HOA sites from 43 AFY imported potable water to 29 AFY of local recycled water – thereby conserving a gross 43 AFY of imported water and a net of 14 AFY in total use. The decrease of gross irrigation water use will be recorded by measuring the annual volume of water delivered to all three HOA sites and comparing it to the baseline. This performance measure is consistent with the 2007 Upper Santa Margarita Watershed IRWM Plan objective of developing more reliable and diverse portfolio of water supplies.

Project Goal: Improve beneficial use of existing water supplies and reduce dependence of imported water supply

The RWPMC Project will reduce dependence on imported water by maximizing local recycled water use in the Upper Santa Margarita IRWM Region that would be used in lieu of imported water. The Project will increase the use of local recycled water supplies by 29 AFY (the estimated water demand necessary after water use efficiency improvements [resulting in 14

**Recycled Water and Plant Material Conversion
Project for HOA Common Areas****Monitoring, Assessment,
and Performance Measures**

AFY of conservation] are made to the current irrigation system) and completely offset imported potable water demand of 43 AFY. The recycled water used at the project sites should therefore decrease the volume of unused recycled supply currently being discharged at the Temecula Valley Regional Water Reclamation Facility (TVRWRF). This performance measure is consistent with the 2007 Upper Santa Margarita Watershed IRWM Plan objective of developing more reliable and diverse portfolio of water supplies.

Project Goal: Help adapt to and mitigate against potential future climate change impacts

The Project's elimination of potable water demand translates into a decrease in the need to purchase treated imported supply. Since the TVRWRF treats all wastewater collected to tertiary standards, there are essentially no additional energy requirements associated with the treatment of recycled water, compared to the energy requirements for the pumping, treatment and conveyance of imported supply. The net conservation of 14 AFY of water supply requires no energy and therefore produces no GHS. Reduction of energy consumption (and associated emissions) as a result of the Project will be quantified by recording the meter readings to the HOA sites and comparing to a pre-project water audit readings. This performance measure is consistent with the 2007 Upper Santa Margarita Watershed IRWM Plan objective to promote economic, social, and environmental sustainability. This performance measure will additionally help meet the RWPMC Project objective of avoiding using 138 MWh/Y and emitting 49MT of CO₂.

Project Goal: Improve overall Regional water use efficiency

The Project includes workshops for HOA residents and the community to learn from the irrigation savings that will be achieved at the HOA Common areas as a result of the irrigation system conversion for recycled water distribution capabilities, the installation of efficient irrigation hardware, and the use of native California low water use plants. The workshops provide Regional education that could influence other further conservation by HOA members and community attendees. This could result in overall conservation savings to RCWD. RCWD has set water use efficiency targets as part of its 2010 Urban Water Management Plan (UWMP), with additional reporting on those targets as part of their 2015 and 2020 UWMPs, RCWD will be able to determine if overall progress on conservation has been achieved – of which this Project would be a part.

Project Goal: Improve water quality at local Murrieta and Temecula Creeks

The Project will install efficient water irrigation systems that will reduce the volume of dry-weather runoff from Project sites. Some of the fertilizer currently applied to the existing turf at the HOA sites will also no longer be needed - reducing a source of nutrient loading. Since there

**Recycled Water and Plant Material Conversion
Project for HOA Common Areas****Monitoring, Assessment,
and Performance Measures**

is no ability to measure dry weather flow as part of this Project nor measure the water quality of that flow, water quality improvements are considered a qualitative benefit (as discussed in Attachment 8). As a result, there is no specific performance measure associated with tracking this Project goal. The project goal is consistent with several of the 2007 USMW IRWM Plan objectives, such as: 1) promote economic, social, and environmental sustainability, 2) Improve water quality, and 3) enhance aquatic habitats.

Recycled Water and Plant Material Conversion Project for HOA Common Areas

Monitoring, Assessment, and Performance Measures

**Table 6-1: Performance Measures Table
Recycled Water and Plant Material Conversion Project for HOA Common Areas**

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
<i>Quantitative Goals: Project implementation will include performance monitoring as described here to determine if goals were met and benefits derived as reported in Attachment 7.</i>				
Decrease total irrigation water demand at project sites	Improve irrigation water use efficiency and decrease water demand by replacing turf with low water use native plants Reduce need for imported potable water supply	Decrease irrigation needs at Projects sites from 43 AFY to 29 AFY	Quantification of water use at the three sites compared to the baseline	Perform pre-project water audits and evaluate usage meter readings of HOA customer connections after Project is implemented.
Improve beneficial use of existing water supplies and reduce dependence of imported water supply	Increase beneficial use of recycled water supply currently wasted Completely eliminate need for treated imported supply to meet irrigation demands at Project sites	Increase the use of local recycled water supply at all three sites by 29 AFY Eliminate potable water use at Project sites thereby decreasing imported water supply use by 43 AFY	Elimination of potable water connection will ensure no potable water is used. Meter readings will then indicate recycled water supply demands	Perform a pre-project water audits and evaluate usage meter readings of HOA customer connections after Project is implemented.
Help adapt to and mitigate against potential future climate change impacts	Reduce energy use and emissions of CO ₂ equivalents from elimination of treated imported water use at Project sites	Avoid 138 MWH/Y of energy consumption and 49 MT/Y of CO ₂ equivalent emissions	Quantification of kWh and CO ₂ equivalents based upon total recycled water used on site compared to estimates for imported water use provided in Attachment 7 baseline.	Perform a pre-project water audits and evaluate usage meter readings of HOA customer connections after Project is implemented.

Recycled Water and Plant Material Conversion Project for HOA Common Areas

Monitoring, Assessment, and Performance Measures

Qualitative Goals: Project implementation will seek to achieve these goals, however, their qualitative benefits are difficult to relate to specific quantifiable targets. Performance indicators have been provided and are understood and expected to result in regional benefits.

Improve overall Regional water use efficiency	Education provided through workshops will encourage similar interest and use of low water use plants and irrigation systems	<i>Not applicable</i>	Overall decrease in demand on RCWD system through RCWD's 2015 and 2020 UWMP and progress toward meeting 20x2020	<i>Not applicable</i>
Improve water quality at local Murrieta and Temecula Creeks	Reduce dry-weather runoff through more efficient irrigation system Eliminate potential need for turf fertilizer by replacing turf with native plants	<i>Not applicable</i>	HOA would not need to purchase fertilizer for common areas	<i>Not applicable</i>

Native Botanical Garden

Project Goals and Performance Measures

The Native Botanical Garden Project will consist of a suite of activities that will promote water use efficiency through the use of native plants, provide recreational opportunities for local residents and enhance habitat. These activities will be executed in order to meet the Project goals. The Project goals each have performance measures that will be used to quantify and verify project performance. The following is a discussion on the Native Botanical Garden Project goals and how the monitoring systems will be used to verify performance. The goals and performance measures (summarized in **Table 6-2**) are consistent with the USMW IRWM Plan and Project objectives as described in Attachment 3.

Project Goal: Improve overall water use efficiency in the Region

The Native Botanical Garden Project will construct educational signage around native plants as well as hold tours and workshops that will educate and encourage property owners to use low water use native landscaping to reduce irrigation water use. The project will document the number of workshop and tour participants (through sign in sheets) to determine how effective the Project will be at disseminating this information.

Project Goal: Increase and enhance recreational space for local residents

The Project will increase recreational space available to the local public by developing a native botanical garden on ½ acre of land. This space will provide walking pathways and other features to allow for enjoyment of the open space. The Project has set up photo points at seven locations that will be used to provide a consistent photographic record of construction and use of recreational facilities and establishment of the garden plantings. Visitation logs from the Hamilton Museum and tour/workshop sign in sheets will help to indicate the number benefited from the enhanced recreational space.

Project Goal: Create native plant ecosystems that improve local habitat

The re-vegetation of the Project site with native plant species will help further enhance the Anza Valley area by creating habitat areas that have been lost to development and agriculture. The Project has set up photo points at seven locations that will be used to provide a consistent photographic record of construction, establishment and growth of the garden plantings.

Native Botanical Garden

Monitoring, Assessment, and Performance Measures

**Table 6-2: Performance Measures Table
Native Botanical Garden Project**

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
Improve Overall Water Use Efficiency in the Region	Increase the potential for conversion of existing non-native landscapes into native landscapes that demand less water for irrigation throughout the Region Hold tours and workshops to educate property owners on water use efficiency measures	Overall attendance at workshops and classes by 100 youths and 100 adults Overall attendance at tours of 200 people	Number of participants that attend the tours and workshops	Record of participants that attended the tours and workshops will be gathered and kept in a visitor log at the native garden botanical site
Increase and enhance recreational space for local residents	Increase recreational space available to local residents Further enhance the benefits of existing open space and museum for visitors	Increase recreational space by ½ acre of land Increase visitation and use of existing open space area	Acres of land converted for recreational use Project site visitation and number of participants that attend the tours and workshops	Record of acres constructed Photo monitoring program Record number of participants and visitors
Create native plant ecosystems that improve local habitat	Increase native habitat coverage in the Anza Valley	Increase native plant area by ½ acre of land	Establishment and growth of native plants on Project sites	Record of acres constructed Photo monitoring program

Upper Valle de Los Caballos Recharge Project

Project Goals and Performance Measures

The Upper Valle de Los Caballos Recharge Project (Upper VDC Project) will consist of a suite of activities that will improve long-term groundwater supply reliability, improve groundwater quality, and improve operational efficiencies at the Valle de Los Caballos Recharge and Recovery Facility. These activities will be executed in order to meet the Project goals (listed below). Progress on meeting quantifiable Project goals can be determined through implementation of performance measures that will be used to quantify and verify project performance. Some Project goals, however, are more difficult to measure since the benefits that they derive are qualitative in nature. The following is a discussion on all of the Upper VDC Project goals and how the monitoring systems will be used to verify performance of the quantitative goals and benefits (those also described in Attachment 7 Technical Justification). The goals and performance measures (summarized in **Table 6-3**) are consistent with the USMW IRWM Plan and Project objectives as described in Attachment 3.

Project Goal: Decrease Imported Supply Costs

This Project would increase RCWD's groundwater recharge capacity by an additional (5,417 AFY) through the installation of a new groundwater production well (Well 161) and other improvements, thus allowing the District to maximize its use of *untreated* (raw) imported water while at the same time reducing its dependence on *treated* imported water capacity. This would result in a significant cost savings to RCWD as it is cheaper to purchase MWD's untreated water supply and treat it locally than to purchase MWD's treated water supply. As documented in the *Upper VDC Conjunctive Use Optimization Study Final Report*, the cost savings is expected to grow over time as the price differential between MWD's *treated* water rates and *untreated* water rate increases. Since RCWD does not have any control over MWD's rates, any rate increases are directly translated into the rates paid by RCWD's customers, which include disadvantaged communities (DACs). By maximizing the amount of *untreated* (cheaper) imported water, the Project will have a beneficial impact on future rate increases for RCWD's customers. This performance measure is consistent with the 2007 USMW IRWM Plan objectives of *promote economic, social and environmental sustainability* and *maximize implementation of water resources projects*.

Upper Valle de Los Caballos Recharge Project**Monitoring, Assessment,
and Performance
Measures****Project Goal: Improve Long-term Groundwater Supply Reliability**

The Project would improve the overall sustainability of RCWD's groundwater supply by increasing the amount of imported supply that can be recharged by 5,417 AFY. A target of 60% recovery for Well 161 has been established, with the remaining recharged supply to be recovered from downstream wells or banked. These targets will be measured by recording the AF of untreated imported water recharge and groundwater recovered via flow meters at the raw water recharge site and production site. This performance measure is consistent with the following 2007 USMW IRWM Plan objectives: *developing more reliable and diverse portfolio of water supplies* and *maximize implementation of water resources projects*.

Project Goal: Improve Groundwater Quality

The Upper VDC may provide improved groundwater quality at the downstream end of the groundwater basin by introducing higher quality, lower TDS water into the basin, thereby diluting the impacts of other degraded water sources such as agricultural drainage. Existing monitoring wells will be used to monitor TDS and other water constituent levels before and after implementation of the project. This information can be used to support the Salt and Nutrient Management Plan that is currently being developed. This performance measure is consistent with the 2007 USMW IRWM Plan objective of *improving water quality*.

Upper Valle de Los Caballos Recharge Project

Monitoring, Assessment, and Performance Measures

Table 6-3: Performance Measures Table
Upper Valle de Los Caballos Recharge Project

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools and Methods
<i>Quantitative Goals: Project implementation will include performance monitoring as described here to determine if goals were met and benefits derived as reported in Attachment 7.</i>				
Decrease imported supply costs	Cost savings associated with maximizing the cheaper untreated imported water supply capacity	Lower Unit Cost for Water Supply	MWD's treated vs. untreated water rates Dollars saved as a direct result of implementing the Project Unit cost of water supply	Budget tracking spreadsheets
Improve long-term groundwater supply reliability	Increase groundwater sustainability by maximizing storage of untreated imported water in the groundwater basin	Increase recharge capacity by 4.5 cfs (3,250 AFY)	Acre feet of untreated imported water recharged into the groundwater basin	Flow meters at raw water recharge site
	Increase groundwater recovery	60% recovery by Well 161	Acre feet of groundwater recovered by production Well 161	Flow meters at production Well 161
<i>Qualitative Goals: Project implementation will seek to achieve these goals, however, their qualitative benefits are difficult to relate to specific quantifiable targets. Performance indicators have been provided and are understood and expected to result in regional benefits.</i>				
Improve groundwater quality	Help to reduce impacts of agricultural drainage and other degraded water sources by introducing a higher quality water supply into the groundwater basin.	No numeric target has been set for this project. This would be a monitoring exercise at the start. The information would be used to support the Salt and Nutrient Management Plan strategy for the groundwater basin.	TDS levels	Existing monitoring wells