



## Upper Santa Clara River Proposition 84 IRWM Plan Implementation Grant Attachment 6 – Monitoring, Assessment, and Performance Measures

### Monitoring, Assessment, and Performance Measures

#### Project Name

Santa Clarita Valley (SCV) WUE Strategic Plan Programs (CLWA-3)

#### Project Overview

The SCV WUE Strategic Plan Programs (CLWA-3) Project identifies programs that will most effectively reduce per capita water use in the Santa Clarita Valley. The goal of the Project is to achieve a long-term reduction in water demand of at least 10 percent over the next 20 years. Newly passed State legislation, Senate Bill 7 of Special Extended Session 7 (SBX7-7), signed into law in November 2009, calls for progress towards a 20 percent reduction in per capita water use by 2020. This CLWA-3 Project will implement five programs identified in the SCV WUE Strategic Plan to help meet these goals.

The five programs being implemented by CLWA-3 are:

1. Santa Clarita Valley Large Landscape Audit and Incentive Program
2. Santa Clarita Valley Commercial, Industrial and Institutional (CII) Audit and Customized Incentive Program
3. Santa Clarita Valley Landscape Contractor Certification and Weather-based Irrigation Controller Program
4. High-Efficiency Clothes Washer (HECW) Machine Program
5. Cash for Grass Rebate Program

The programs have already had three successful years of implementation and now seek the expansion recommended in the Strategic Plan. Full project benefits will accrue beginning in 2015. At this time, water conservation resulting from the five programs will yield avoided SWP imports of 380 acre-feet per year (AFY).

#### Performance Measures

The primary goal of the SCV WUE Strategic Plan Programs (CLWA-3) is to reduce water demand by at least 10 percent over the next 20 years. Newly passed State water conservation requirements calls for progress towards a 20 percent reduction in per capita water use by 2020. The goal will in turn reduce runoff and improve water quality.

CLWA-3 will also help meet the Upper Santa Clara River (USCR) IRWM Plan's objectives of **reducing water demand** and **improving water quality**. This is accomplished by decreasing demand and the need to convey and treat imported water and by reducing runoff from irrigation to local channels.

By improving indoor and outdoor water use efficiency and conserving water, this Project will reduce water demand, avoid costs for purchase of imported water, increase water supply reliability for the CLWA customers, and improve operational flexibility for CLWA. The programs have already had three successful years of implementation and now seek the expansion recommended in the Strategic Plan.

The Project's water savings of 308 AFY will meet the IRWM Plan objective **Reduce Water Demand**, and measurable target of 10 percent reduction in projected urban water demand through the Region through implementation of water conservation measures.

The SCV WUE Strategic Plan Programs Project performance measures are summarized in Table 6-1 and include: reduced water demand; improved water supply reliability; improved water quality; public education on water conservation; reduced greenhouse gas emissions; and reduced wastewater treatment. The project will be implemented within the CLWA service area and a monitoring plan will be identified when the PMP is developed. Hence, specific monitoring locations are not shown on the detailed project map (Figure CLWA-3).



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The SCV WUE Strategic Plan Programs Project will reduce dependence on imported water by reducing overall water demand that will otherwise be met with imported SWP water. The amount of imported water avoided as a result of the project is quantified as the reduction in water demand (in AFY) in comparison to previous years and is monitored through customer meters.

By decreasing the amount of water used for irrigation and indoor use, the SCV WUE Programs Strategic Plan Project results in an overall decrease in runoff caused by over-irrigation and thus the loading-rate of pollutants into groundwater. To **Improve Water Quality**, an IRWM Plan objective is measured as the decrease in runoff which is proportional to the reduction in irrigation demand resulting from the project. The reduction in indoor use decreases the total volume of effluent requiring treatment at local water reclamation plants.

This project will allow for an improvement of water quality by contributing to the reduction in the import of salts to the Basin. The improvement in water quality is the mass of salt that is not brought into the Basin and is measured as the avoided chloride treatment required by local wastewater treatment plant and the reduction in outdoor water demand multiplied by the concentration of salts.

By offsetting imported water demands with reduced water usage, the Project avoids emissions of CO<sub>2</sub> (a greenhouse gas) generated by transporting imported SWP water to the Valley and from hot water use associated with clothes washers. The long-distance transport of water in conveyance systems is a major element of California's total demand for electricity. In addition, CLWA-3 will also avoid energy use to heat water and associated CO<sub>2</sub> emissions through the HECW machine program. The reduction in CO<sub>2</sub> emissions is measured as the avoided import of SWP to the Region and the avoided energy use to heat water through the HECW machine program versus "without-project" condition improvements, assuming no WUE programs are completed. This is part of the performance measure and determines the reduction in energy requirements resulting from this project.

Water savings achieved through the HECW rebate program are the only savings attributable to indoor water use. In addition to preventing 82 AFY of SWP water from being imported, HECWs incentivized through this program will prevent the equivalent amount of water from passing through the Santa Clarita Valley Sanitation District, where it would be treated and then discharged into the Santa Clara River.

### **1. Are the identified monitoring targets appropriate for the benefits?**

Yes, the identified monitoring targets for the SCV WUE Strategic Plan Programs Project are appropriate for the identified benefits. The monitoring targets vary depending on the project and are logical for each of the various WUE Programs. For example, the monitoring target for the project goal of reducing the water demand is to verify/track the installation of the WBICs, record the number of rebates distributed for the HECW machines, and verify the square footage of turf removal. These verifications can then be used to calculate the estimated water savings and compare it to the measured water savings, discussed below.

### **2. Will the measurement tools and methods effectively monitor project performance and target progress?**

Yes, the proposed measurement tools and methods for the SCV WUE Strategic Plan Programs will effectively monitor project performance and target progress. The measurement tools as identified in Table 6-1, are straight-forward and easily obtainable. There are two types of measuring tools used for this project – the first a simple water meter comparison of before the project and after the project to determine the water savings from the project. The second measuring tool is an actual document record of (a) a rebate being used, (b) a nozzle being installed, or (c) turf being removed. Both measurement types are effective in monitoring the progress and performance of the SCV WUE Strategic Plan Programs Project.

### **3. Is it feasible to meet the targets within the life of the project(s)?**



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The feasibility and success of each of the Best Management Practices (BMPs) to be implemented by CLWA-3 is documented in the SCV WUE Strategic Plan, provided as Reference CLWA-3.1. The five selected programs have already had three successful years of implementation and now seek expansion consistent with the SCV WUE Strategic Plan. These conservation projects will be (or are already) underway regardless of this specific funding opportunity since they are an important part of helping the Region to achieve a balanced water portfolio, and are necessary in order to meet regulatory requirements affecting demand. Based on existing literature as well as documentation provided for this project, it is feasible for this project to meet the identified targets.



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Table 6-1: Santa Clarita Valley (SCV) WUE Strategic Plan Programs (CLWA-3) Project Performance Measures

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools & Methods
Reduce dependence on imported water and improve water supply reliability.	Decreased outdoor water use and overall water demand in the Region.	Reduction of water demand and water dependence by 380 AFY.	Quantification of the decrease in water demand compared to previous years.	Comparison of actual water usage vs. historical usage.
	Interest in utilization of 1,700 WBICs and 5,000 high-efficiency clothes washer (HECW) machines.	Distribution of 1,700 WBICs, 5,000 HECW machines.	Quantification of 1,700 WBICs and 5,000 HECW machines distributed.	Tracking/Monitoring of 1,700 WBICs installed and 5,000 HECW machine rebates distributed.
	Rebate 300,000 sq. ft. of turf removal.	300,000 sq. ft. of turf removal.	Quantification of rebates of 300,000 sq. ft. of turf removal.	Tracking/Monitoring for 300,000 sq. ft. of turf removal.
Improve Water Quality	Reduced import of chlorides into the Watershed.	Reduction in ~37 metric tons of chloride per year.	Monitoring chlorides concentrations in SWP water.	Part of standard monitoring data collected by CLWA.
Reduce landscape irrigation water use	Improved landscape irrigation efficiency. Reduced water demand.	Reduce landscape irrigation water use by 20 percent for program participants.	Volume of irrigation water saved as a result of the project.	Compare participating customers' water billing data before and after Program implementation.
Educate public on water conservation	Decreased outdoor water use and overall water demand in the Region.	Distribution of 1,700 WBICs, 5,000 HECW machines to manage water usage.	Quantification of increase in WBICs and HECW machines purchased.	Record number of WBICs and HECW machines purchased.
Reduced GHG emissions	Reduced emissions of CO <sub>2</sub> .	Reduction in the emission of 210 metric tons of CO <sub>2</sub> per year.	Quantification of existing imported water use avoided as a result of the project.	Volume delivered to water customers per customer flow meters; comparison of actual water usage vs. historical usage.
Avoided Sanitation Treatment	Decreased volume of wastewater to be treated at water reclamation plants (WRPs).	Reduction of water demand and water dependence by 84 AFY.	Quantification of reduced wastewater treatment volume from indoor water use of HECW.	Volume delivered to SCVSD WRPs; comparison of actual wastewater volume vs. historical usage.



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Table 6-1: Santa Clarita Valley (SCV) WUE Strategic Plan Programs (CLWA-3) Project Performance Measures (continued)

Monitoring System: CLWA will obtain water meter data for each targeted customer, as appropriate, from each of the participating agencies. In addition, the vendor selected to provide both customer audits and irrigation system adjustments/improvements will provide a report summarizing their installations for each customer as well as the aggregate for the program on a periodic basis. As part of the reporting task for this grant, collected data will be compiled and analyzed, and results will be used to assess progress toward project objectives, as described in Attachment 3 – Work Plan. The data will also be presented as part of the IRWM Grant quarterly and/or final report.

Data Management and Analyses: As discussed above, CLWA will use water meter and water purchase data from each participating agency and will also collect customer audit and irrigation system adjustments/improvements data by customer. Data will be maintained and conveyed in spreadsheets, hard-copy, and/or PDFs. Customer water meter data will be analyzed before and after the audit and adjustments/improvements have been conducted to assess water use reductions. Water meter data and lists of the irrigation adjustments/improvements that were implemented will also be reviewed to evaluate which measures may have been most effective at reducing water use.

Monitoring for IRWM Plan Goals and Objectives: The Data Management and Analyses findings will be compared against the goals and objectives of the USCR IRWM Plan, as denoted below:

- Reduce water demand**
- Improve Operational Efficiency**
- Increase Water Supply**
- Improve Water Quality**
- Promote Resource Stewardship**



## Upper Santa Clara River Proposition 84 IRWM Plan Implementation Grant Attachment 6 – Monitoring, Assessment, And Performance Measures

### Project Name

Santa Clarita Water Division (SCWD) WUE Programs (SCWD-2)

### Project Overview

The elements identified in this program originate in SCWD's 2012 WUE Strategic Plan (SCWD Strategic Plan). The SCWD Strategic Plan was developed in July 2012 to identify, analyze and provide a roadmap for implementing programs that will allow SCWD to achieve its SBX7-7 requirements and reduce dependence on imported water sources. The SCWD Strategic Plan specifies ten water use efficiency incentive programs. Combining the implementation efforts with supporting outreach and education programs will allow SCWD to achieve its goals. SCWD-2 is requesting funding to implement three of the ten programs identified in the SCWD Strategic Plan: (1) High-Efficiency Irrigation Nozzle Distribution, (2) High-Efficiency Clothes Washer (HECW) Machine Rebate Program as part of the Residential and Commercial Rebate Program, and (3) Large Landscape Water Budgets. The first two programs are already being implemented and SCWD would like to expand these efforts based on their success to date and the recommendations made in their Strategic Plan. The large landscape program represents a new effort and the focus on irrigation, which is significant in inland communities. Full project benefits will accrue beginning in 2015. At this time, water conservation resulting from the three programs will yield avoided SWP imports of 156 AFY.

### Performance Measures

The SCWD WUE Programs (SCWD-2) identifies programs that will reduce dependence on imported water sources and most effectively reduce per capita water use in the SCWD service area. This SCWD-2 Project implements three programs identified in the SCWD WUE Strategic Plan to help meet these goals.

SCWD-2 also helps meet the USCR IRWM Plan objectives of **reducing water demand** and **improving water quality**. This is accomplished by decreasing demand and the need to convey and treat imported water and by reducing runoff from irrigation to local channels.

By improving indoor and outdoor water use efficiency and conserving water, this Project reduces water demand, avoids costs for purchase of imported water, increases water supply reliability for the SCWD customers, and improves operational flexibility for SCWD. Two of the three programs have already had one successful year of implementation and now seek expansion consistent with the Strategic Plan. The third proposed program (Large Landscape Water Budgets) will begin in 2014 assuming grant funding.

The SCWD WUE Programs Project performance measures are summarized in Table 6-2 and include: improved water supply reliability; improved water quality; public education on water conservation; reduced greenhouse gas emissions; and reduced wastewater treatment. The project will be implemented within the SCWD service area and a monitoring plan will be identified when the PMP is developed. Hence, specific monitoring locations are not shown on the detailed project map (Figure SCWD-2).

The SCWD WUE Programs Project reduces dependence on imported water by reducing overall water demand that will otherwise be met with imported SWP water. The amount of imported water avoided as a result of the project is quantified as the reduction in water demand (in AFY) in comparison to previous years and will be monitored through customer meters.

By decreasing the amount of water used for irrigation and indoor use, the SCWD WUE Programs Project results in an overall decrease in runoff caused by over-irrigation and thus the loading-rate of pollutants into groundwater. To **Improve Water Quality**, an IRWM Plan objective is measured as the decrease in runoff which is proportional to the reduction in irrigation demand resulting from the project. The reduction in indoor use decreases the total volume of effluent requiring treatment at local water reclamation plants.

This project allows for an improvement of water quality by contributing to the reduction in the import of salts to the Basin. The improvement in water quality is the mass of salt that is not brought into the Basin and is measured as the avoided chloride treatment that is required by local wastewater treatment plant and the reduction in outdoor water demand multiplied by the concentration of salts.



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By offsetting imported water demands with reduced water usage, the Project avoids emissions of CO<sub>2</sub> (a greenhouse gas) generated by transporting imported SWP water to the Valley and from hot water use associated with clothes washers. The long-distance transport of water in conveyance systems is a major element of California's total demand for electricity. In addition, SCWD-2 will also avoid energy use to heat water and associated CO<sub>2</sub> emissions through the HECW machine program. The reduction in CO<sub>2</sub> emissions is measured as the avoided import of SWP to the Region and the avoided energy use to heat water through the HECW machine program versus "without-project" condition improvements, assuming no WUE programs are completed. This is part of the performance measure and determines the reduction in energy requirements resulting from this project.

Water savings achieved through the HECW rebate program are the only savings attributable to indoor water use. In addition to preventing 22 AFY of SWP water from being imported, HECWs incentivized through this program will prevent the equivalent amount of water from passing through the Santa Clarita Valley Sanitation District, where it would be treated and then discharged into the Santa Clara River.

### **1. Are the identified monitoring targets appropriate for the benefits?**

Yes, the identified monitoring targets for the SCWD WUE Programs Project are appropriate for the identified benefits. The monitoring targets vary depending on the project and are logical for each of the various WUE Programs. For example, the monitoring target for the project goal of reducing the water demand is to verify the distribution of the rebate program for the high-efficiency washing machines, and large landscapes. These rebates can then be used to calculate the estimated water savings and compare it to the measured water savings, discussed below.

### **2. Will the measurement tools and methods effectively monitor project performance and target progress?**

Yes, the proposed measurement tools and methods for the SCWD WUE Programs Project will effectively monitor project performance and target progress. The measurement tools as identified in Table 6-2, are straight-forward and easily obtainable. There are two types of measuring tools used for this project – the first a simple water meter comparison of before the project and after the project to determine the water savings from the project. The second measuring tool is an actual document record of (a) a rebate being used or (b) a nozzle being distributed. Both measurement types are effective in monitoring the progress and performance of the SCWD WUE Programs Project.

### **3. Is it feasible to meet the targets within the life of the project(s)?**

The feasibility and success of each of the Best Management Practices (BMPs) to be implemented by SCWD-2 is documented in the 2012 SCWD WUE Strategic Plan, provided as Reference SCWD-2.1. Two of the three programs have already had one successful year of implementation and now seek expansion consistent with the Strategic Plan. These conservation projects will be (or are already) underway regardless of this specific funding opportunity since they are an important part of helping the Region to achieve a balanced water portfolio, and are necessary in order to meet regulatory requirements affecting demand. Based on existing literature as well as documentation provided for this project, it is feasible for this project to meet the identified targets.



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Table 6-2: Santa Clarita Water Division (SCWD) WUE Programs (SCWD-2) Project Performance Measures

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools & Methods
Reduce dependence on imported water and improve water supply reliability.	Decreased water use and overall water demand in the Region.	Reduction of water demand and water dependence by 156 AFY.	Quantification of the decrease in water demand compared to previous years.	Comparison of actual water usage vs. historical usage.
	Interest in utilization of 15,000 High-Efficiency Irrigation Nozzles.	Distribution of 15,000 High-Efficiency Irrigation Nozzles.	Quantification of 15,000 High-Efficiency Irrigation Nozzles distributed.	Tracing/Monitoring of 15,000 High-Efficiency Irrigation Nozzles.
	Rebate 1,000 high-efficiency clothes washer (HECW) machines purchases and 20 large landscape sites for landscape modifications.	Distribution of 1,000 rebates for HECW machines and 20 rebates to large landscape sites.	Quantification of rebates to 1,000 rebates for HECW machines and 20 rebates to large landscape sites for modifications.	Record of rebates to 1,000 HECW machines and verification of 20 large landscape sites for modifications.
Improve Water Quality	Reduced import of chlorides into the Watershed.	Reduction in ~15 metric tons of chlorides per year.	Monitoring chlorides concentrations in SWP water.	Part of standard monitoring data collected by CLWA.
Reduce landscape irrigation water use	Improved landscape irrigation efficiency. Reduced water demand.	Reduce landscape irrigation water use by 20 percent for program participants.	Volume of irrigation water saved as a result of the project.	Compare participating customers' water billing data before and after Program implementation.
Educate public on water conservation	Decreased outdoor water use and overall water demand in the Region.	Distribution of 15,000 High-Efficiency Irrigation Nozzles to manage water usage.	Quantification of increase in High-Efficiency Irrigation Nozzles purchased.	Record number of High-Efficiency Irrigation Nozzles purchased.
Reduced GHG emissions	Reduced emissions of CO <sub>2</sub> .	Reduction in the emission of 88 metric tons of CO <sub>2</sub> per year.	Quantification of existing imported water use avoided as a result of the project.	Volume delivered to water customers per customer flow meters; comparison of actual water usage vs. historical usage.
Avoided Sanitation Treatment	Decreased volume of wastewater to be treated at water reclamation plants (WRPs).	Reduction of water demand and water dependence by 22 AFY.	Quantification of reduced wastewater treatment volume from indoor water use of HECW	Volume delivered to SCVSD WRPs; comparison of actual wastewater volume vs. historical usage.



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Table 6-2: Santa Clarita Water Division (SCWD) WUE Programs (SCWD-2) Project Performance Measures (continued)

**Monitoring System:** SCWD will obtain water meter data for each targeted customer, as appropriate. In addition, the vendor selected to provide the large landscape irrigation system adjustments/improvements will provide a report summarizing their installations for each customer as well as the aggregate for the program on a periodic basis. As part of the reporting task for this grant, collected data will be compiled and analyzed, and results will be used to assess progress toward project objectives, as described in Attachment 3 – Work Plan. The data will also be presented as part of the IRWM Grant quarterly and/or final report.

**Data Management and Analyses:** As discussed above, SCWD will use water meter and water purchase data from their records and will also collect customer landscape irrigation system adjustments/improvements data by customer. Data will be maintained and conveyed in spreadsheets, hard-copy, and/or PDFs. Customer water meter data will be analyzed before and after the adjustments/improvements have been conducted to assess water use reductions. Water meter data and lists of the irrigation adjustments/improvements that were implemented will also be reviewed to evaluate which measures may have been most effective at reducing water use.

**Monitoring for IRWM Plan Goals and Objectives:** The Data Management and Analyses findings will be compared against the goals and objectives of the USCR IRWM Plan, as denoted below:

- Reduce water demand**
- Improve Operational Efficiency**
- Increase Water Supply**
- Improve Water Quality**
- Promote Resource Stewardship**



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### Project Name

Foothill Feeder Connection (CLWA-8)

### Project Overview

CLWA's Foothill Feeder Connection (CLWA-8) Project will provide initially 6 million gallons per day (MGD) of additional capacity to CLWA's potable water system (up to a maximum of 30 MGD additional capacity when the Rio Vista Water Treatment Plant (RVWTP) is expanded in the future), consequently improving operational efficiency and reliability. The project will replace the current connection, which is undersized for the recently expanded RVWTP, and thus allow CLWA to utilize the full treatment plant capacity. Also, the current connection was designed as a temporary structure so a permanent connection will also increase infrastructure reliability.

The Project conveys untreated surface water from the terminus of the State Water Project (SWP) - Castaic Lake - to the Metropolitan Water District's (MWD's) Jensen Water Filtration Treatment Plant (Jensen Plant) and the Foothill Feeder Connection to CLWA's 240-foot long, 42-inch diameter connection linked to CLWA's 102-inch raw water pipeline, which conveys water to CLWA's RVWTP. Approximately 200 feet of 48-inch piping from the Raw Water Pipeline to the existing Foothill Feeder will be required for the construction.

### Performance Measures

The Foothill Feeder Connection (CLWA-8) Project performance measures are summarized in Table 6-3 and include: improved operational efficiency and reliability during seismic events and for emergency shutdowns and maintenance repairs.

The RVWTP's recent expansion was designed for a 60 MGD capacity, but the actual constructed capacity of the RVWTP is 66 MGD. Future expansion from its current 66 MGD treatment capacity is planned to 90 MGD as demand for treated water increase. CLWA has an agreement with MWD, provided as Reference CLWA-8.6, stating that CLWA requested construction of a service connection with a maximum capacity of 140 cfs (90 MGD) on MWD's Foothill Feeder pipeline. For this reason, the proposed capacity of the Foothill Feeder Connection (current capacity is 60 MGD) is 90 MGD to match the planned maximum capacity of the RVWTP.

The Foothill Feeder Connection (CLWA-8) Project will provide additional capacity to CLWA's potable water system allowing CLWA to improve operational efficiency and reliably meet consumers' demands. The Project allows for an increase of up to 30 MGD (33,600 AFY) of water delivery immediately for CLWA. The CLWA-8 Project is also necessary for any future expansions of the RVWTP, which are planned in the future.

#### 1. Are the identified monitoring targets appropriate for the benefits?

Yes, the identified monitoring targets for the Foothill Feeder Connection (CLWA-8) Project are appropriate for the identified benefits. There are only two monitoring targets for this project and both are simple. The first being the ability to delivery water to the RVWTP in volumes equal to the Plant's capacity and the second being no interruption of service due to MWD (the owner of the connection) needing to shutdown the existing feeder connection (as there currently is no backup or redundancy in the system for the connection) or if there was an earthquake and the existing connection did not withstand the seismic activity and shutdown. The existing feeder connection was built to be temporary and does not meet seismic standards.

#### 2. Will the measurement tools and methods effectively monitor project performance and target progress?

Yes, the proposed measurement tools and methods for the Foothill Feeder Connection (CLWA-8) Project will effectively monitor project performance and target progress. The measurement tools as identified in Table 6-3, are straight-forward and logical. The connection will have a flow meter



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installed as part of its requirements that will allow constant monitoring of the amount of flow passing through the Foothill Feeder Connection (CLWA-8) Project. As a redundant measuring tool, there is an additional existing intake flow meter at the RVWTP that will record the flow passing into the WTP. Comparing these two flow meters will confirm that the Foothill Feeder Connection is adequately working. Therefore, all measurement tools are effective in monitoring the progress and performance of the Foothill Feeder Connection (CLWA-8) Project.

### **3. Is it feasible to meet the targets within the life of the project(s)?**

There is no question that it is possible to meet the targets of this Project within the life of the Project. This is a straight forward engineering construction project. Once the connection is constructed, the targets will be met. There will be no waiting period to determine if the project will work; only construction is required and then the water can flow through the connection to the treatment plant. The Project will follow all the necessary protocols for constructing a project in this area including CEQA, permitting, etc. Thus, it is feasible to meet the targets within the life of the Proposal.



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Table 6-3: Foothill Feeder Connection (CLWA-8) Project Performance Measures

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools & Methods
Improve operational efficiency and reliability by providing additional capacity to CLWA’s potable water system.	Add 6 million gallons per day (MGD) initially, of additional capacity to CLWA’s potable water system (and up to a maximum of 30 MGD additional capacity when the Rio Vista Water Treatment Plant (RVWTP) is expanded in the future.	Ability to delivery water to the RVWTP in volumes equal to the Plant’s capacity.	Capacity to deliver raw water to RVWTP.	Foothill Feeder Connection flow meter records and RVWTP intake flow meter and supervisory control and data acquisition (SCADA) system.
	Improve water supply reliability during seismic events.	No interruption of service.	Having a connection that meets current seismic standards.	Following major seismic event, no pipe leaks or ruptures, support structures intact, valves functional and electrical controls maintained.
	Redundancy and operational flexibility by retaining the original connection for backup should the new connection be shut down for maintenance or repair.	No interruption of service.	Continued operations during emergency shutdowns or maintenance repairs.	MWD does not request CLWA to shutdown the connection for repairs.

**Monitoring System:** CLWA will obtain data from the RVWTP intake flow meter, necessary SCADA data for daily operations, SWP import records, and MWD flow meter records. In addition, the contractor selected to construct the connection will provide a report summarizing their progress as well as the aggregate for the program on a periodic basis. As part of the reporting task for this grant, collected data will be compiled and analyzed, and results will be used to assess progress toward project objectives, as described in Attachment 3 – Work Plan. The data will also be presented as part of the IRWM Grant quarterly and/or final report.

**Data Management and Analyses:** As discussed above, CLWA will use the RVWTP intake flow meter data and any necessary SCADA data to determine how much flow has passed through the flow meter installed at the connection. Data will be maintained and conveyed in spreadsheets, hard-copy, and/or PDFs. Flow meter data will be analyzed before and after the connector is expanded to assess flow use increases.

**Monitoring for IRWM Plan Goals and Objectives:** The Data Management and Analyses findings will be compared against the goals and objectives of the USCR IRWM Plan, as denoted below:

- Reduce Water Demand
- Improve Operational Efficiency**
- Increase Water Supply
- Improve Water Quality
- Promote Resource Stewardship



## Upper Santa Clara River Proposition 84 IRWM Plan Implementation Grant Attachment 6 – Monitoring, Assessment, And Performance Measures

### Project Name

Pellet Water Softening Treatment Plant - Phase 1 (NCWD-2)

### Project Overview

This Project is designed to improve drinking water quality by reducing calcium carbonate hardness. The focus of the project is to alleviate the number one water quality customer complaint. Over the years, NCWD has received more customer complaints about hard water than any other type of water quality concern. It remains by the far the greatest number of customer complaints received by NCWD. Many customers attempt to alleviate the problems associated with hard water by installing costly point-of-use water softeners. Some of these softeners (automatic water softener (AWS) types) contribute chloride directly into the sewer, which in turn, ends up being discharged into the Santa Clara River. Source water treatment is a more cost-effective solution compared to point-of-use systems. In addition, the pellet softening technology has benefits over more traditional softening techniques such as ion exchange and reverse osmosis. For example, pellet softening requires less energy and creates a reusable by-product unlike the high-energy demands and “brine” waste that ion exchange and reverse osmosis treatments produce.

This project includes the first phase of the construction and implementation of the three phase treatment system. This Phase 1 effort consists of completing a water quality analysis for two of NCWD groundwater wells, establishing the treatment criteria and feasibility of pellet softening technology, determining the size of the treatment plant, treatment chemicals needed, and capital and operational cost estimates as well as conceptual design and an initial environmental study. The Phase 2 project (not part of this proposed grant project) completes the CEQA requirements for the project, engineering design of the pellet treatment plant, and public outreach to community for acceptance of the necessary rate increase for pre-softened water (Prop 218) and pellet usage. The Phase 3 project (not part of this proposed grant project) will complete the construction of the pellet treatment plant and initial start-up activities. Funding is being requested for Phase 1 only, which includes the engineering and planning associated with complete water quality analysis of NCWD Wells 12 and 13 to establish the treatment criteria and feasibility of pellet softening technology.

### Performance Measures

The main goals of the Pellet Water Softening Treatment Plant Project are to:

1. Improve source water quality by reducing naturally occurring calcium water hardness.
2. Reduce water demand, because hard water contributes to the inefficiency of household appliances, increases the need for additional soaps and detergents, and contributes to the increased use of point-of-use treatment devices, all of which increase water use.
3. Reduce and/or eliminate the need for costly point-of-use water softening systems. Thereby reducing water demand if the water softening systems removed are AWS.
4. By reducing and/or eliminating the need for point-of-use softening devices, the amount of chloride being discharged into the sewer system would be reduced.

The Project will eventually result in the installation of a Pellet Water Softening Treatment Plant during a future phase (Phases 2 and 3) of the project.

The Project performance measures are summarized in Table 6-4 and include: completion of the planning and design of the project; and the technical studies supporting the feasibility of the project.

For Phase 1, performance measures for the Project will focus on completing the planning, design, and engineering tasks necessary to determine the feasibility of constructing the Pellet Water Softening Treatment Plant in order to proceed to Phases 2 and 3 and complete the project. Funding is requested for water quality analysis for two of NCWD groundwater wells, establishing the treatment criteria and feasibility of pellet softening technology, determining the size of the treatment plant, treatment chemicals needed, and capital and operational cost estimates as well as conceptual design and an initial environmental study.



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Specific monitoring locations are not shown on the detailed project map (Figure NCWD-2).

### **1. Are the identified monitoring targets appropriate for the benefits?**

Yes, the identified monitoring targets for the Pellet Water Softening Treatment Plant Project are appropriate for the identified benefits. The monitoring targets are what is required by NCWD to consider the Project feasible (as determined through Phase 1 activities) to move to the next Phases for implementation (Phases 2 and 3). There are three of these targets: 1). A rate payer increase not above target of \$5/month, 2). Treatment Plant will fit on selected site, and 3). Groundwater quality of wells suitable for pellet type treatment.

### **2. Will the measurement tools and methods effectively monitor project performance and target progress?**

Yes, the proposed measurement tools and methods for the Pellet Water Softening Treatment Plant Project will effectively monitor project performance and target progress. The measurement tools as identified in Table 6-4, are straight-forward and easily obtainable. There are two types of measuring tools used for this project – the first is the approval from the regulatory agencies after reviewing all of the necessary engineering studies and reports from Phase 1 required to move forward onto Phase 2 and Phase 3. The second is the support and approval from not just the regulatory agencies, but from the rate payers who will benefit from the project, and also be helping to fund the future phases of the project with rate increases. Both measurement types are effective in monitoring the progress and performance of the Pellet Water Softening Treatment Plant Project.

### **3. Is it feasible to meet the targets within the life of the project(s)?**

Yes, NCWD is committed to completing the planning and design of the Project within the timeframe of the Project and within the budget proposed. The Project is structured in a phased approach so that each phase can be implemented in an efficient and practical manner, well suited to the NCWD's financial capabilities and needs of the Project.



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Table 6-4: Pellet Water Softening Treatment Plant - Phase 1 (NCWD-2) Project Performance Measures

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools & Methods
Completion of planning and engineering required for project	Issuance of permits required to move forward onto Phase 2 and Phase 3 of the project	Assurances from planning studies that feasibility of project is valid from 1). A rate payer point of view (cost not over \$5/month target), 2). Plant will fit on selected site, and 3). Groundwater quality suitable for pellet type treatment.	Preparation of all necessary Engineering studies, reports, and plans to begin Phase 2.	Submittal and feedback from regulatory agencies and permits issued and support from rate payers indicating approval to move forward with project.

Monitoring System: NCWD will gather each of the planning studies and reports for this Phase as they are completed and evaluate whether the completion of the Project (future phases) is feasible. As part of the reporting task for this grant, collected data will be compiled and analyzed, and results will be used to assess progress toward project objectives, as described in Attachment 3 – Work Plan. The data will also be presented as part of the IRWM Grant quarterly and/or final report.

Data Management and Analyses: As discussed above, the monitoring of Phase 1 goals will be completed to determine feasibility of treatment using pellet softening using: 1) adequacy of selected site to fit the necessary treatment plant size, 2) increased costs to rate payer not over \$5/month target, and 3) groundwater quality of wells suitable for pellet type treatment..

Monitoring for IRWM Plan Goals and Objectives: The Data Management and Analyses findings will be compared against the goals and objectives of the USCR IRWM Plan, as denoted below:

- Reduce water demand
- Improve Operational Efficiency
- Increase Water Supply
- Improve Water Quality**
- Promote Resource Stewardship



## Upper Santa Clara River Proposition 84 IRWM Plan Implementation Grant Attachment 6 – Monitoring, Assessment, And Performance Measures

### Project Name

Automatic Water Softener Rebate and Public Outreach Program (SCVSD-1)

### Project Overview

This Automatic Water Softener Rebate and Public Outreach Program (SCVSD-1) builds on a ground breaking, nationally recognized multi-pronged pollution prevention approach by the Santa Clarita Valley Sanitation District (Sanitation District) to reduce chloride sources that has targeted all customer sectors, promoted innovation, spurred three local ordinances and more. These efforts were initiated in response to the development of the USCR Chloride Total Maximum Daily Load (TMDL), which requires the Sanitation District to reduce chloride levels in the discharges from its two water reclamation plants (WRPs). The Program will focus on removing the remaining automatic water softeners in the Santa Clarita Valley through a combination of activities including: home inspections, issuing Notices of Violations to residents that still have their automatic water softeners, issuing rebates to residents that remove their automatic water softeners, chloride monitoring, and public outreach. The goal of the Program is to remove all remaining automatic water softeners in the Sanitation District's service area. The multi-faceted effort is expected to achieve an additional reduction in the chloride discharged from the WRPs of up to 5 milligrams/liter (mg/L), keep awareness of the chloride problem high in the community and prevent backsliding (residents installing and/or using illegal automatic water softeners), minimize the size of future chloride compliance facilities and help the Sanitation District comply with the USCR chloride TMDL.

The Sanitation District operates two WRPs in the Santa Clarita Valley, the Saugus and Valencia WRPs, which discharge tertiary treated wastewater into the Upper Santa Clara River (USCR). The effluent from the WRPs contains chloride in excess of the water quality objective set by the Los Angeles Regional Water Quality Control Board (RWQCB) for the USCR of 100 mg/L. In 2002, the Los Angeles RWQCB first began development of the USCR Chloride TMDL, which was subsequently revised most recently under RWQCB Resolution No. R4-2008-012, to require the Sanitation District to reduce chloride levels in the discharges from the WRPs.

### Performance Measures

The Sanitation District's goal is to remove all remaining automatic water softeners in the Sanitation District's service area in order to achieve a reduction in the chloride discharged from the Saugus and Valencia WRPs of up to 5 mg/L. In addition, the publicity associated with this program is expected to prevent backsliding (residents installing and/or using illegal automatic water softeners) by keeping awareness of the chloride problem high in the community. Reducing the chloride load in the Sanitation District's WRP discharges to the river from the remaining automatic water softeners will also minimize the size of future chloride compliance facilities and help the Sanitation District comply with the USCR chloride TMDL.

#### 1. Are the identified monitoring targets appropriate for the benefits?

Yes, the identified monitoring targets for the Automatic Water Softener Rebate and Public Outreach Program (SCVSD-1) are appropriate for the identified benefits. The Sanitation District has been implementing various phases of this program for multiple years and the program appears to be working well. Therefore, the monitoring targets that the Sanitation District has identified based on their experience are appropriate for the benefits.

#### 2. Will the measurement tools and methods effectively monitor project performance and target progress?

Yes, the proposed measurement tools and methods for the Automatic Water Softener Rebate and Public Outreach Program (SCVSD-1) will effectively monitor program performance and target progress. The Sanitation District has already complied with the Regional Board's monitoring requirements with the annual progress report required under the USCR Chloride TMDL Implementation Plan, Task 3. Their measurement tools and methods (as detailed in Reference SCVSD-1.1) have proven effective to date for monitoring progress. The Sanitation District will



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continue collection of data on industrial user chloride concentrations and flowrates, industrial user self-monitoring of chloride concentrations, quantification of commercial user flowrates, tracking of treatment plant sodium hypochlorite use, tracking of volumes of wastes accepted at the Saugus Liquid Waste Disposal Station, collection of groundwater and SWP water chloride data from local water purveyors, and monitoring of chloride concentrations and flowrates at the Saugus and Valencia WRPs. The Sanitation District will also continue to conduct influent chloride studies at Saugus and Valencia WRPs and evaluate ways to improve chloride source estimates.

### **3. Is it feasible to meet the targets within the life of the project(s)?**

The identified targets in Table 6-5 can be achieved within the life of the Program. The Sanitation District has already removed 7,763 automatic water softeners and the chloride level in the effluent at the WRPs has dropped dramatically. According to Reference SCVSD-1.1, the estimated chloride loading from self-regenerating water softeners (SRWS) peaked in 2003/2004 at about 9,000 pounds per day, representing 59 mg/L in the system effluent for the Saugus and Valencia WRPs. This coincided with enactment of the prohibition on installation of SRWS in the Sanitation District in 2003. The SRWS contribution maintained a downward trend in 2011, as the Automatic Water Softener Rebate Program Phase II, Ordinance, Ordinance Enforcement Program, and community-wide public outreach efforts convinced residents to remove existing SRWS. In 2011, the estimated chloride loading from SRWS was approximately 993 pounds per day, representing about 6 mg/L in the system effluent. Therefore, removing the SRWS has dropped the chloride levels associated with residential automatic water softeners from 59 mg/L to approximately 6 mg/L over the course of seven to eight years. The targets for this program are expected to be met within the life of the program.



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Table 6-5: Automatic Water Softener Rebate and Public Outreach Program (SCVSD-1) Performance Measures

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools & Methods
Improve water quality	Reduction in chloride discharged to the Santa Clara River by Saugus and Valencia Water Reclamation Plants (WRPs).	Achieve a reduction in the chloride discharged from the Saugus and Valencia WRPs by up to 5 mg/L.	Reduction in chloride discharged to the Santa Clara River by Saugus and Valencia Water Reclamation Plants (WRPs).	Sampling and monitoring currently being completed on the final effluent from the Saugus and Valencia WRPs by SCVSD (as detailed in Reference SCVSD-1.1)
		Remove 500 residential automatic water softeners (AWS).	Reduction in the number of residential AWS.	Number of AWS removed that have been verified by the Sanitation District.
		Rebates provided for removing residential AWS from households.	Reduction in the number of residential AWS.	Calculate the number of rebates issued.
		Approximately 7,000 home inspections conducted.	Reduction in the number of automatic water softeners.	Conduct approximately 7,000 home inspections.
Reduction in water waste/flushing by AWS.	Reduce waste of water.	Remove 500 automatic water softeners.	Literature on water waste by AWS.	Verified number of AWS removed.
Maintain improved water quality	Prevent backsliding (reinstallation of removed AWS).	No meaningful increase in estimated chloride concentration from residential AWS.	Maintenance or reduction in the number of AWS.	Residential AWS chloride concentration estimated in the annual Chloride Source Identification/Reduction, Pollution Prevention, and Public Outreach Plan.
Reduce GHG	Reduced emissions of CO <sub>2</sub> .	Reduction in the emission of 994 metric tons of CO <sub>2</sub> per year through reduction in size of future chloride treatment plant..	Quantification of size reduction in future chloride compliance facilities that otherwise are required to remove chloride from the WRP discharges.	Documented methods of measuring reduction in GHG.

**Monitoring System:** SCVSD will continue to monitor the effluent at the Saugus and Valencia WRPs for chloride. In addition, the Regional Board requires the Sanitation District to provide an annual report on the update of chloride sources, which will be used to assess the progress toward the objectives. As part of the reporting task for this grant, collected data will be compiled and analyzed, and results will be used to assess progress toward project objectives, as described in Attachment 3 – Work Plan. The data will also be presented as part of the IRWM Grant quarterly and/or final report.

**Data Management and Analyses:** As discussed above, SCVSD will continue to monitor the effluent at the Saugus and Valencia WRPs for chloride. Data will be maintained and conveyed in spreadsheets, hard-copy, and/or PDFs. Monitoring data will be analyzed at regular time intervals to assess chloride reductions.

**Monitoring for IRWM Plan Goals and Objectives:** The Data Management and Analyses findings will be compared against the goals and objectives of the USCR IRWM Plan, as denoted below:

- Reduce water demand**
- Improve Operational Efficiency
- Increase Water Supply
- Improve Water Quality**
- Promote Resource Stewardship**



## Upper Santa Clara River Proposition 84 IRWM Plan Implementation Grant Attachment 6 – Monitoring, Assessment, And Performance Measures

### Project Name

Upper Santa Clara River (USCR) Arundo/Tamarisk Removal Program (SCARP) Implementation (SC 1/BCN-1)

### Project Overview

The USCR Arundo/Tamarisk Removal Program (SCARP) Implementation (SC 1/BCN-1) Project is the implementation of site specific arundo and tamarisk removal projects within the City of Santa Clarita and portions in the USCR watershed of Los Angeles County along the San Francisquito Creek and the Bouquet Canyon Creek (both tributaries to the Santa Clara River). One of the areas is a three acre site that is highly visible along Central Park that can demonstrate a natural resource management project to the public, improve habitat, and increase surface water. Due to the nature of arundo and tamarisk, it is necessary to undertake removal and restoration of these invasive plant species, some of which have colonized in large extents in the USCR watershed, to prevent “re-seeding” of the noxious weed in the lower river reaches.

### Performance Measures

The goals of this project are at minimum to successfully eradicate arundo and tamarisk from within the specific sites described in the work plan. The USCR Arundo/Tamarisk Removal Program (SCARP) Implementation Project will result in increased river flows via elimination of water loss from evapotranspiration as arundo consumes almost three times the amount of water used by native species, and studies of arundo in the Santa Clara River have shown transpiration of about 10 acre-feet per acre. One adult tamarisk tree can consume approximately four acre-feet of groundwater annually. With an assumed restoration of approximately 42 acres of arundo to be removed from the two tributaries of the Santa Clara River, Bouquet Canyon Creek and San Francisquito Creek, the project will save at least 840 AFY. The project meets the IRWM Plan objective to **Promote Resource Stewardship** and will contribute to the target of reducing invasive species to 40 percent or less cover of the understory and canopy in years 1 to 5. The Project’s water savings will help to meet the IRWM Plan objective **Reduce Water Demand** and will be applied to the measurable target to reduce overall water demand by 20 percent throughout the region by 2020.

The USCR Arundo/Tamarisk Removal Program (SCARP) Implementation (SC 1/BCN-1) Project Performance Measures are summarized in Table 6-6 and include: eliminating arundo and tamarisk from the two tributaries of the Santa Clara River, Bouquet Canyon Creek and San Francisquito Creek upper; improved water quality within the River; and prevention of future reinfestations of the invasive species.

The project sites will be frequently monitored to ensure that any changes, such as additional arundo resprouts, will be treated in a timely manner. Previous restoration efforts have shown that this after treatment monitoring and maintenance program is essential to the success of the restoration effort. The monitoring and maintenance program is backed by the Santa Clara River Invasive Weeds Task Force (Task Force) and funded through an endowment that the US Fish and Wildlife Service developed specifically to fund-long term management of previously cut arundo infestation areas. The City of Santa Clarita has been in discussions with US Fish and Wildlife Service to continue the life of this program. Potential monitoring locations are shown on the detailed project map, Figure SC-1/ BCN-1.

#### 1. Are the identified monitoring targets appropriate for the benefits?

Yes, the identified monitoring targets for the USCR Arundo/Tamarisk Removal Program (SCARP) Implementation (SC 1/BCN-1) Project are appropriate for the identified benefits. The monitoring targets are very clear cut for this project; either there is 100% removal of arundo/tamerisk or not. This also applies to the reinfestation target of *Zero reinfestation for five consecutive years during monitoring*. These targets are being used on a similar project that is being funded in a different location on the Santa Clara River and they are working adequately.

#### 2. Will the measurement tools and methods effectively monitor project performance and target progress?



## Upper Santa Clara River Proposition 84 IRWM Plan Implementation Grant Attachment 6 – Monitoring, Assessment, And Performance Measures

Yes, the proposed measurement tools and methods for the USCR Arundo/Tamarisk Removal Program (SCARP) Implementation (SC 1/BCN-1) Project will effectively monitor project performance and target progress. The measurement tools as identified in Table 6-6 are direct observation and routine sampling of the Santa Clara River to be completed by the City of Santa Clarita. As long as proper documentation and protocols are followed, the measuring tools for this project should be effective in monitoring performance and progress for the Project.

### 3. **Is it Feasible to Meet the Targets within the Life of the Proposal?**

The identified targets in Table 6-6 can be achieved within the life of the Project. Restoration efforts at the City of Santa Clarita's 297-acre site were first implemented in 2006 and 75 acres of arundo and tamarisk were successfully removed. A lapse in funding resulted in a hold on the project, however it did allow for gauging how much restoration could be done with what funds and with what resources. Given the commitment to post eradication monitoring, it is with high certainty that the targets are feasible.



## Upper Santa Clara River Proposition 84 IRWM Plan Implementation Grant Attachment 6 – Monitoring, Assessment, And Performance Measures

Table 6-6: USCR Arundo/Tamarisk Removal Program (SCARP) Implementation (SC-1/BCN-1) Project Performance Measures

Project Goals	Desired Outcomes	Targets	Performance Indicators	Measurement Tools & Methods
Remove high water consuming invasive plants.	Reduce water use by invasive plants.	Save 840 AFY of water.	Scientific studies on water use by arundo.	Measurement of arundo acreage removed.
Eliminate Arundo from two tributaries of the upper Santa Clara River; Bouquet Canyon Creek and San Francisquito Creek.	Complete eradication from project area sites.	Removal of 42 acres arundo and 100 percent eradication of Arundo from project area sites.	Percent decrease in Arundo cover.	Direct observation and monitoring records of the Task Force and US Fish and Wildlife Service.
Eliminate Tamarisk from two tributaries of the upper Santa Clara River; Bouquet Canyon Creek and San Francisquito Creek.	Complete eradication from project area sites.	100 percent eradication of Tamarisk from the project area sites.	Percent decrease in Tamarisk cover.	Direct observation and monitoring records of the Task Force and US Fish and Wildlife Service.
Reduced GHG emissions	Reduced emissions of CO <sub>2</sub> .	Reduction in the emission of 214 metric tons of CO <sub>2</sub> per year.	Quantification of existing imported water use avoided as a result of the project.	Volume delivered to water customers per customer flow meters; comparison of actual water usage vs. historical usage.
Improve Santa Clara River Water Quality	Reduced import of chlorides into the Watershed.	Reduction in ~41 metric tons of chloride per year.	Monitoring chlorides concentrations in SWP water.	Part of standard monitoring data collected by CLWA.
Prevent reinfestation of Arundo and Tamarisk.	Five years of continuous monitoring with zero infestations.	Zero reinfestation for five consecutive years during monitoring.	Percent recurrence with observed transition to pre-infestation conditions.	Direct observation and monitoring records of the Task Force and US Fish and Wildlife Service.

**Monitoring System:** City of Santa Clarita will complete direct observation and monitoring records on the progress of the project. In addition, the contractor selected to implement the project will provide a report to summarize their removal process at each site as well as the aggregate for the program on a periodic basis. As part of the reporting task for this grant, collected data will be compiled and analyzed, and results will be used to assess progress toward project objectives, as described in Attachment 3 – Work Plan. The data will also be presented as part of the IRWM Grant quarterly and/or final report.

**Data Management and Analyses:** As discussed above, City of Santa Clarita will complete direct observation and monitoring records on the progress of the project. In addition, the contractor selected to implement the project will provide a report to summarize their removal process at each site as well as the aggregate for the program on a periodic basis. Data will be maintained and conveyed in spreadsheets, hard-copy, and/or PDFs.

**Monitoring for IRWM Plan Goals and Objectives:** The Data Management and Analyses findings will be compared against the goals and objectives of the USCR IRWM Plan, as denoted below:

- Reduce water demand**
- Improve Operational Efficiency
- Increase Water Supply**
- Improve Water Quality**
- Promote Resource Stewardship**