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Section 4: Goals and Objectives

The goals and objectives presented in this section represent the foundational intent of this Integrated Regional Water Management Plan (IRWM Plan). Formulating meaningful and relevant goals and objectives for the Mojave Region required significant collaboration and collective interaction among participating stakeholders. Developing the goals and objectives took place over an 11 month period with about 15 conversations among various combinations of the Project Team, Stakeholder Group, and the Consultant Team. The draft Goals and Objectives were circulated for review and comment to the stakeholders four times to allow for thorough consideration and refining of what ultimately sets the direction of the Plan.

4.1 Planning Terms

People familiar with the broad discipline of planning recognize that different agencies and organizations may use similar terms in slightly different ways in their processes. During the Mojave IRWM Plan update process, the Consultant Team established and used the following set of terms:

- Planning Process Goals
- Plan Goals
- Plan Objectives

Within this Plan, the term goal is used to mean a desired outcome or result for which effort will be made to accomplish. The Planning Process Goals set near the beginning of the Plan development process describe what the Project Team intended to accomplish by the time the Plan is adopted (see Section 1.3.1).

The Plan Goals describe a high-level perspective of what the Plan is intended to address (and by inference what it is not intended to address). The Plan Goals are written to be relevant over the entire planning horizon and beyond, and may never be fully realized. In other words, effort towards achieving the Plan Goals is expected to continue indefinitely.

In contrast, the term objective is used to mean a specific and tangible outcome that is intended to be achieved by or during a designated time. The *Plan Objectives* were developed using the “SMART” criteria, meaning that each objective should be Specific, Measurable, Attainable, Relevant, and Time-based. When crafted properly, SMART objectives help to promote actions that lead to measurable results consistent with Plan Goals. Objectives written using the SMART format are designed to allow people to measure and track progress toward improving integrated water management within the Region over time.

During the process to determine the goals and objectives with the stakeholders, it was recommended that the Mojave Region IRWM Plan only have measureable objectives and not include any goals because the goals can be hard to measure. The stakeholders agreed with the recommendation and only discussed Plan Objectives going forward, so there are no Plan Goals for the Mojave Region IRWM Plan.

The Plan Objectives were developed between January and November 2013 using an iterative and collaborative approach that included two phases:

- Identify challenges and opportunities within the Region
- Propose draft Plan Objectives, discuss, review and refine

The first step in developing Plan Objectives was to identify the water related challenges and opportunities that people believed to be important in the Region now. Identification and discussion of challenges and opportunities began early in the Plan development process, ultimately generating the Plan Objectives. Once the stakeholder group had identified a representative list of challenges and opportunities (see Section 4.2), Plan Objectives were proposed by individual Stakeholders, the Consultant Team and members of the Project Team. The draft Plan Objectives were discussed, reviewed and refined over several months until broad agreement was reached on the Plan Objectives listed in Section 4.3.

4.2 Challenges and Opportunities

4.2.1 Introduction

This section describes the major challenges and opportunities related to integrated water management in the Mojave Region. These challenges and opportunities were identified through multiple meetings with stakeholders and were formed by the information presented in Sections 2 and 3 of this IRWM Plan. The term “challenges and opportunities” is used to mean the water-related items of interest or concern within the Region. The list does not distinguish whether a particular item is a challenge or an opportunity, because that designation often depends on the perspective of the reader. Given the diversity of interests and values within the Region, one person’s challenge may very well be seen as an opportunity by someone else. By including both challenges and opportunities, stakeholders were able to reach broad agreement that these are the topics that warrant consideration and focus within the Mojave IRWM Plan.

Identification and discussion of challenges and opportunities began early in the Plan development process, ultimately generating the Plan goals and objectives presented in later in this Section. Over the course of several conversations, the Project Team began grouping the challenges and opportunities into nine (9) major themes, which are listed below in no particular order:

- Coordination
- Engagement
- Disadvantaged Community Needs
- Water Supplies
- Water Quality
- Finance and Affordability
- Risk and Uncertainty
- Mojave Basin Area Judgment and Water Rights
- Project Ideas

Once these themes were identified, they were presented by the Project Team at a series of public workshops to solicit stakeholder feedback as well as additional ideas, issues and, potentially, categories. The results of the public workshops are presented in the following subsection. After that, the section describes in more detail each of the nine major themes and the specific concerns with each, as well as pertinent information from the public workshops for each theme.

4.2.1.1 Public Workshops

Community engagement has been critical to the update process, with the key issue being identifying community-specific concerns and needs relating to water resources. To guide the update of the IRWM Plan, ensure that the Plan and its objectives reflect and guide the needs of the community, increase public participation and obtain meaningful input from a diverse range of community members, the IRWM Plan Project Team held seven public workshops throughout the Region.

All of the workshops and meetings had similar formats consisting of a brief presentation on the update of the IRWM Plan process and small group discussion sessions. Five common areas of concern emerged during the small group discussion sessions from all the meetings and workshops. These common areas correspond well with the nine challenges and opportunities originally identified by the stakeholders and Project Team. The common areas, and corresponding challenge and opportunity theme in parenthesis, are:

- Water supply and conservation (Water Supplies)
- Water quality
- Cost of water resources (Finance and Affordability)
- Water rights (Mojave Basin Area Judgment and Water Rights)
- Stormwater and flood management (Project Ideas)
- Growth and land use (Water Supplies)
- Natural resource management (Water Supplies)
- Limited water resources (Water Supplies)
- Limited funding resources to address water-related needs (Finance and Affordability)
- Need for regional collaboration to carry out projects (Coordination)
- Climate change (Water Supplies and Water Quality)

The top three priority areas that workshop participants ranked as most relevant to their community were: (1) water supply and conservation, (2) water quality and (3) cost of water resources. The full list by workshop location is shown in Table 4-1, which shows the regional ranking and overall number of votes for each challenge area presented to the group as well as additional issues proposed by participants.

Table 4-1: Stakeholder Workshop Prioritization of Water-Related Topics

Water-Related Topics	Lucerne Valley	Barstow	Victorville	Newberry Springs	Piñon Hills/Phelan	Helendale	Yucca Valley	Total Votes	% of All Votes
Water Supply and Conservation	22	13	5	20	6	10	20	96	26%
Water Quality	16	13	3	5	6	6	16	65	18%
Cost of Water Resources	15	14	4	9		3	14	59	16%
Water Rights	19	2		15	1	2	2	41	11%
Stormwater and Flood Management	18		1	4	6	1	9	39	11%
Growth and Land Use	7		4	3	6		7	27	7%
Natural Resource Management (habitat protection)	1			4	3	1	3	12	3%
Education ^(a)			1				7	8	2%
Climate Change	1	1		1		1	3	7	2%
Recycled Water ^(a)						5		5	1%
Hauled Water Issues ^(a)	3							3	1%
Gray Water Issues ^(a)	1							1	0.2%
Grant Writing and Tracking – Connect the needs with the funding sources ^(a)									

Note: (a) These items were proposed by workshop participants.

Each of the nine themes and their associated challenges and/or opportunities is described in the following sections and reflects feedback from the public workshops. For further background and context, see Section 2: Region Description and Section 3: Water Supply and Water Demand.

4.2.2 Coordination

The key issues, needs, challenges, and priorities for the Mojave Region with respect to coordination include the following, which are discussed in greater detail below:

- Recognize that multiple types of plans and authorities exist within the Region and the IRWM Plan needs to consider these and plan to coordinate implementation where relevant and practical;
- Establish a common management vision, goals, and objectives related to integrated water management for the Region;
- Implementing projects requires coordination and cooperation through the life of the project from concept, design, financing, permitting, construction, maintenance, etc. Engage the necessary organizations and interests early in the process;
- Recognize and encourage close interconnection between land use planning and water management;
- How to prioritize projects for consideration of limited grant funds?

- Land use allegations.

4.2.2.1 Plans and Authorities in Region

The relationships among the Region's land use planning entities such as cities and the County, and the Regional Water Management Group (RWMG) are sturdy enough to serve as bases for increased collaboration. As detailed in Section 1, the RWMG's goal is to:

- Foster coordination, collaboration and communication between agencies responsible for water-related items and interested stakeholders to achieve greater efficiencies, to provide for integration of projects, enhance public services and build public support for vital projects.

The RWMG and land use managers need to consider ways to improve collaboration on a variety of topics and areas of focus through creation of subcommittees and other forums to track related issues such as floodplain management, flood control planning, groundwater management, treatment and conveyance facilities, stormwater management, water conservation efforts, watershed management, recreational area management, land use changes, general plan updates, water supply for emergency planning during a catastrophic outage, and habitat management.

In the past much of the collaboration and coordination on these issues occurred through the development and implementation of formal documents, such as urban water management plans (UWMPs), adjudications, general plans, groundwater management plans, flood insurance studies, watershed assessments, and watershed sanitary surveys. The IRWM Plan provides an opportunity to improve collaboration by increasing public participation and by increasing awareness of these plans in the land use and water planning decision making processes. Going forward, the RWMG is committed to collaborate with land use managers in the planning and development of projects that address water resources-related objectives.

Effective management of the Region's water resources also requires effective ongoing communication and collaboration between land and water resource managers and stewards. These relationships are further discussed in Chapters 12 and 13.

4.2.2.2 Establish Common Management Vision

Cities and counties (for unincorporated areas) are the regulatory agencies responsible for land use planning within the State of California. Land use regulations and policies such as general plans, zoning ordinances, California Environmental Quality Act (CEQA) compliance, and permit conditions can be valuable policy and implementation tools for effective water management. The California Government Code establishes requirements for the development of General Plans to guide land use decisions, in which water resources play an important role. Water resources is typically not an 'element' of a General Plan, but is discussed within the context of the General Plans required 'elements'; land use, circulation, housing, conservation, open space, noise, and safety.

Land uses within the Mojave Region are provided for in local and regional policies and regulations, including the San Bernardino County General Plan (Adopted March 13, 2007 and amended May 22, 2012), and the various city and town general plans as detailed in

Section 2.3.1 Land Use Policies. These policies would guide consideration of the Regional challenge of potential land use allegations.

Recent legislation has also addressed the gap between land use planning and water resource management. In 2001, two water supply planning bills, Senate Bill 610 (SB 610) and Senate Bill 221 (SB 221), were enacted that require greater coordination and more extensive data to be shared between water suppliers and local land use agencies for large development projects and plans.

SB 610, codified as Water Code sections 10910 and 10911, requires the public water system that may supply water to a proposed residential development project of more than 500 dwelling units (or a commercial/industrial development project with similar water use), to prepare a water supply assessment for use by the lead planning agency in its compliance with CEQA. Such a water supply assessment (WSA) is performed in conjunction with the land use approval process associated with the project and must include an evaluation of the sufficiency of the water supplies available to the water supplier serving the project to meet existing and anticipated future demands.

SB 221 requires projects which include tentative tract maps for over 500 dwelling units to obtain verification from the water system operator that will supply the project with water, that it has a sufficient water supply to serve the proposed project and all other existing and planned future uses, including agricultural and industrial uses, in its area over a 20-year period, even in multiple dry years. SB 221 is intended as a “fail safe” mechanism to ensure that collaboration on finding the needed water supplies to serve a new large subdivision occurs before construction begins.

Additionally, water suppliers must coordinate with land use planning agencies in the development of their UWMPs, which include projections of future water demand and water supply availability during normal and dry periods. Water agencies and land use planning agencies within the Region are working together to ensure adequate management and planning for water supplies to meet the needs of growing communities.

Coordination was discussed at several of the stakeholder workshops/meetings held during the update of the IRWM Plan development. Participants’ encouraged improved collaboration between agencies to help resolve water-related issues, coordinate mutually beneficial projects, offset project costs and better manage water demand. By engaging the necessary organizations and interests early in the planning process, the success of the implementation of the IRWM Plan and projects is more likely.

The discussion of how to prioritize projects for consideration of limited grant funds is discussed in Section 4.7 Finance and Affordability.

4.2.3 Engagement

The key issues, needs, challenges, and priorities for the Mojave Region with respect to engagement include the following, which are discussed in greater detail below:

- Ensure that both the Colorado River Regional Water Quality Control Board (RWQCB) and the Lahontan RWQCB are participating in the IRWM planning process;

- A proactive approach is required to encourage engagement by all those who can benefit from the IRWM Plan but who may not yet recognize or understand that;
- Encourage participation by all agencies with some responsibility for water management or activities that affect water management in the Region;
- Ensure disadvantaged communities (DACs) are represented in the process;
- How to engage disinterested citizens and organizations?
- Minimal producers (individuals producing 10 acre-feet (af) or less of water within the boundaries of the Mojave Basin Area Judgment) need a voice in the process;
 - There are 13 minimum water producers in the Baja subarea who do not know they are minimum water producers; why they should participate in the IRWM planning process, or how they can participate?

As discussed in Section 1.2: Stakeholder Involvement, the update to the IRWM Plan process has expanded upon the significant efforts made to identify and solicit input from stakeholders with interest in long-term reliable water supplies for the Region from the 2004 Regional Water Management Plan (RWMP), which included 44 water agencies, 11 municipal and county agencies, six state and federal agencies, and over 25 community interest groups.

Stakeholders were notified regarding the Plan update process by various means of outreach processes including an IRWM Plan website, emails, newsletters, letters via the US Postal Service, and personal phone calls.

4.2.4 Disadvantaged Community Needs

Most of the Mojave Region is comprised of Disadvantaged Communities (DAC) (see Figure 2-6), defined by the State as any community where the median household income (MHI) is below 80% of the statewide median household income (SMHI). Three of the seven public workshops were developed specifically to reach residents of DACs in the Region, while the other four were geared to all residents of the Region regardless of income level. The Public Workshops and DAC Meetings provided the same information in the same format.

For the DAC Meetings, effort was made to publish notices of the meetings in places where potential participants would see the notices. For example, popular ethnic grocery stores, community halls, and senior centers were all sought as ideal locations for flyers to be posted. Where appropriate, the meeting flyers were translated into Spanish and posted and the meeting handout materials were also available in Spanish. The Project Team had Spanish speaking presenters attend the DAC meetings where a high Spanish speaking population turnout was expected.

For more detailed information on the stakeholder engagement process, DAC participations and specifics of workshops and meetings see Section 1.2: Stakeholder Involvement.

The key issues, needs, challenges, and priorities for the Mojave Region with respect to disadvantaged communities include the following:

- Understand the needs of different DAC communities in the Region;
- Help educate communities about requirements and opportunities;
- Support DACs to apply for assistance;
- Help improve water management systems, including water quality, that serve DACs.

4.2.5 Water Supplies

The key issues, needs, challenges, and priorities for the Mojave Region with respect to water supply needs include the following, which are discussed in greater detail below:

- Expect increasing competition between different water uses in the Region;
- Provide sufficient supplies to support additional growth (residential, commercial, and industrial) in the Region;
- Encourage and support additional water conservation;
- Expand use of reclaimed water;
- Create additional opportunities for recharge;
- Look for new supplies;
- Use ordinance(s) to encourage desired behaviors;
- Will there be any protection against selling of water between subareas and/or outside the Region?
- Alternative water conservation methods are needed in the Baja subarea.

As competition for water supplies throughout California grows more intense, water users are being asked to make use of limited resources in an efficient manner. Some recent regulatory requirements require additional steps towards efficient water use; the Water Conservation Act of 2009 (SBX7-7) requires a 20% statewide reduction in per capita water use by 2020 for urban water suppliers. The Region's ten urban water suppliers (detailed in Section 3.3.1), are implementing plans to achieve their specific water use targets to comply with direction provided by the state Department of Water Resources (DWR). Some of the methods being used by urban water suppliers include water conservation best management practices (BMPs) as defined by the California Urban Water Conservation Council.

Sustainable, reliable water supplies are necessary to maintain the Region's economic viability and ecological health, but climate change could affect the availability of water supplies in the future. Large variations in the weather patterns would affect the municipalities, farmers, and streams receiving water from all of their sources. In many cases, improvements to infrastructure to better distribute surface water supplies around the Region so that they may be used conjunctively with groundwater would improve resilience responses to the potential effects of climate change. However, the impacts of climate change on the Region are difficult to predict;

current information from climate change models is not sufficiently precise to demonstrate specific impacts to water supply reliability within the Region. Yet it is likely that climate change will impact imported SWP supplies through time; DWR has analyzed these potential future impacts in its regular publication of the *State Water Project Delivery Reliability Report*.

Public meeting workshop participants discussed diminishing water supplies, citing concerns about groundwater overdraft related to pumping by large well owners and new developments, contamination of groundwater basins and other water quality issues limiting supply availability as well as reductions in imported water.

The Mojave Region watershed has numerous and significant water resource management and environmental stewardship challenges. These often occur when resources are managed for conflicting uses, such as between land use development and habitat conservation.

Mojave Region water suppliers are tasked with balancing the water needs of sensitive environmental areas with the water needs of their customers, and ensuring that natural resources and habitats are shielded from potential adverse impacts associated with water resource management. Environmental water demands (including the quantity, timing, duration, and frequency of flows required by plants, wildlife, and fisheries) frequently conflict with water supply demands for agricultural irrigation and/or urban development. For example, diversions of water from streams and reservoir fluctuations can limit survival rates for aquatic and riparian species. Opportunities exist for water managers to evaluate their delivery schedules, reservoir ramping rates, and other flow requirements and find "windows" for providing flow for environmental and habitat support.

4.2.6 Water Quality

Quality of local groundwater supplies in general are good throughout the Region, is useable for agricultural purposes, and meets drinking water standards. Exceptions are areas that have exceeded the drinking water standards called maximum contaminant levels (MCLs) for a variety of compounds. Some of these are due to human factors, for example, there are areas in the Region that have elevated nitrate levels in groundwater due to septic tank discharges. Some contaminants, such as sulfates and fluoride, are naturally occurring in certain areas of the Region.

The key issues, needs, challenges, and priorities for the Mojave Region with respect to water quality include the following, which are discussed in greater detail below:

- Closed basin with no outfall for discharge so increase in salts is a continuous challenge;
- Concern for meeting water quality regulations in certain groundwater subareas;
- Existing septic systems are contaminating groundwater with nitrates;
- Changes in imported water quality;
- Handling emerging contaminants;
- Implement watershed protections;

- Increasing concentrations of natural constituents in water supplies;
- Threats from improper well abandonment;
- Deal with historic contamination of groundwater.

Comment [MLC1]: Does this mean legacy contamination?

4.2.6.1 Mojave Region is Closed Basin

As described in Section 2, the Mojave Region is a closed topographic basin with no outlet to the ocean. Therefore, any reuse, recharge, or treated effluent (recycled water) generated in the Mojave Region must be percolated, reused, evaporated, or transpired by plants. This places great responsibility on the wastewater treatment providers in the Mojave Region to provide alternative effluent management methods while still being compliant with their Waste Discharge Requirements (WDRs).

4.2.6.2 Water Quality Regulations

Section 3.4: Water Quality explained that the Mojave Region is governed by two RWQCBs – the Lahontan and the Colorado River. Therefore both of these Regional Boards have a *Water Quality Control Plan for the Basin (Basin Plan)* that details the surface water and groundwater quality that is acceptable. Recharge source water would need to meet these requirements before recharge could occur. Additionally, requirements are stricter for water that is injected versus water that is infiltrated.

The California Department of Public Health (CDPH) is responsible for enforcing the SDWA and California-specific drinking water regulations. Many Mojave Region water sources contain high levels of total dissolved solids (TDS), particularly groundwater, recycled water, and State Water Project (SWP) supplies (SWP supply has TDS concentrations and salinity that are variable depending on the time and type of year as well as pumping patterns). TDS is a common water quality parameter used to measure salinity of water supplies. The secondary drinking water standard for TDS is 500 mg/L, above which problems with taste, odor and color may occur.

Public Meeting Workshop participants identified water quality issues related to the high numbers of septic systems located in proximity to the groundwater basins that serve as their community's water source.

The following land uses and human activities can contribute to the degradation of soils, water bodies, and habitat and can make watershed management more difficult. While some of the listed activities have been described under several earlier topics, they are emphasized here because of their importance to the stakeholders:

- Alteration of the natural landscape for any purpose, creating disturbed soils susceptible to erosion, and requiring installation of minimum control measures prescribed for National Pollutant Discharge Elimination System (NPDES) stormwater management permit compliance;
- Application or accidental release of potentially contaminating substances or prohibited waste discharges to water supplies, including wastewater system overflows, septic system failures, water treatment byproducts, pest abatement, improper disposal of litter or refuse, and lack of stormwater management;

- Removal of natural vegetation and wildlife habitat, including destruction of wetlands and waterways;
- Improper livestock husbandry and other poorly implemented agriculture, industry, and commercial stormwater quality BMPs; and
- Potential for conflict between land and water use for: (a) recreation and tourism, (b) agriculture, and (c) opportunities to restore and preserve the environment.

4.2.6.2.1 Handling Emerging Contaminants

Emerging contaminants of concern such as arsenic and nitrate will require water suppliers, water reclamation plants (WRPs), and water treatment plants (WTPs) to conduct routine monitoring and sampling of their systems and could impact their treatment methods. The ability to remove these emerging contaminants also has a positive economic impact on the agricultural community since it reduces the damage to crops. It also benefits the WRPs and WTPs striving for compliance with more stringent WDRs.

Challenges to achieving and maintaining compliance with applicable regulatory requirements may include:

- **Compliance with Environmental Mandates:** Depending upon the extent and jurisdiction of a water management project, water agencies must comply with some or all of the following regulations and agencies:
 - California Environmental Quality Act
 - National Environmental Policy Act (if a Federal interest exists)
 - California Department of Fish and Wildlife
 - U.S. Army Corps of Engineers (Corps)
 - Lahontan and/or Colorado River RWQCBs
 - U.S. Fish and Wildlife Service
 - California Department of Public Health
- **Compliance with Flood Protection Permitting:** Environmental permits from the Corps and the RWQCB are typically required to construct flood protection or stream restoration projects and maintain existing facilities, even for routine maintenance of channels, including dredging, bank repair, and vegetation management. Flood protection agencies must also cooperate with efforts by Federal and state wildlife agencies and non-governmental organizations (NGOs) to maintain and restore critical habitat and assist species recovery. In each case, the local flood protection agency must evaluate and mitigate, if necessary, the effects of these projects on conveyance of flood flows. The time and cost associated with obtaining these permits are a considerable burden on the local agencies.

Public Meeting Workshop participants attributed water quality issues to a number of factors:

- Increased exposure to contaminants due to sources migrating from adjacent basins;
- Irrigation and maintenance of recreation and agricultural uses such as golf courses and alfalfa farms;
- Industrial dumping;
- Mining activities;
- Improper use of abandoned wells.

4.2.7 Finance and Affordability

The key issues, needs, challenges, and priorities for the Mojave Region with respect to finance and affordability include the following, which are discussed in greater detail below:

- How to maintain and improve systems while keeping supplies affordable?
- Facing increasing costs to meet regulations.
- Want to keep high desert a viable option for new development.
- How to address challenges and opportunities without obvious revenue sources?

Finance and affordability were recurring themes at the Public Meeting Workshops. The theme was primarily tied to ongoing issues of decreased supply linked to overdraft of local groundwater basins previously caused by lack of regulation. Also, some users think the larger water users and operators are over-pumping or using too much water, especially if these larger users are not included in the adjudication. Other users feel new development and unstructured growth are the causes of decreased supply and still others voiced concern that inadequate fee structures were the reason for the financial difficulties that many water agencies are facing.

One of the toughest challenges identified during the workshops was inadequate financial resources to fund efforts to resolve local and regional water issues and special projects. Participants also identified potential opportunities for resolving some of the fiscal challenges that included replacing septic systems with sewer, providing incentive programs to promote and increase conservation practices, and expanding and improving existing infrastructure to increase water efficiency.

Grant funding consideration.

4.2.8 Risk and Uncertainty

The key issues, needs, challenges, and priorities for the Mojave Region with respect to risk and uncertainty include the following, which are discussed in greater detail below:

- Plan for changes in the Sacramento-San Joaquin Delta;

- Prepare for earthquake or other cause for disruption to imported water deliveries;
- Reduce damages from stormwater and flood events;
- Consider potential impacts from climate change.

4.2.8.1 Delta Changes

The Mojave Region relies heavily on imported SWP water that flows through the Sacramento-San Joaquin Delta and is conveyed to the Region for groundwater recharge. However, the long-term reliability of this water supply is unknown because of a variety of issues including infrastructure reliability, endangered species regulations, water quality, sea level rise, ecosystem restoration, political interests and more.

Approximately 1,600 miles of levees that are part of the California Central Valley Flood Control System, and another 1,000 miles of local levees, constructed in an attempt to protect the Central Valley and Delta regions from flooding (DWR Flood Warnings, 2005) and protect Delta water supplies. In the event of a massive failure of these levees, the quality of Delta water could be severely compromised as salt water rushed in from the Bay to equalize water pressure. This would immediately affect the water supplies, since the SWP pumping plant would need to be shut down to prevent further saltwater intrusion.

Many groups within the state are working to improve the Delta's habitat, ecosystem function and water conveyance systems but have conflicting visions of how to resolve the many issues associated with the Delta. Because of the Mojave Region's dependence on the Delta for critical SWP water supply, the uncertainty of the Delta's future is a significant concern that must be addressed by water supplies and considered in the integrated planning process.

4.2.8.2 Stormwater and Flood Events

Floods occur when runoff exceeds the capacity of a river or stream channel, overflowing into adjacent low-lying lands called floodplains. Human activities in floodplain areas are often exposed to flood damage.

Physical damage from floods includes the following:

- Inundation of structures, causing water damage to structural elements and contents;
- Erosion or scouring of stream banks, roadway embankments, foundations, footings for bridge piers, and other features;
- Impact damage to structures, roads, bridges, culverts, and other features from high-velocity flow and from debris carried by floodwaters. Such debris may also accumulate on bridge piers and in culverts, increasing loads on these features or causing overtopping or backwater effects;
- Destruction of crops, erosion of topsoil, and deposition of debris and sediment on croplands.

Floods also cause economic losses through closure of businesses and government facilities, disruption of communications and the provision of utilities such as water and sewer, result in excessive expenditures for emergency response, and generally disturb the normal functions of a community. Flood management strategies recommended in this document will serve as guidelines to address concerns and prevent some of the damage listed above.

Several local land use entities, including the County of San Bernardino, participate in the National Flood Insurance Program (NFIP) as administered by the Federal Emergency Management Agency (FEMA). By adopting flood damage prevention ordinances to regulate development in special flood hazard areas, private property owners in participating communities are allowed to purchase affordable flood insurance through NFIP, while the community retains its eligibility to receive certain federally backed monies and disaster relief funds.

The FEMA Flood Insurance Rate Map for the Mojave Region designates multiple areas as "High Risk," areas with a 1 percent or greater risk of flooding in any year and a 26 percent chance of flooding over the life of a 30-year mortgage. The area at greatest flood risk is the area along the Mojave River.

Flood management is generally guided by local, State, and Federal entities but relies upon the local communities for implementation. Local communities like cities and counties, through the adoption of ordinances and the formation of special districts, manage development in floodplains and implement flood mitigation projects that prevent flood damages.

4.2.8.3 Climate Change Impacts

Climate change is driven by increasing concentrations of carbon dioxide and other greenhouse gases that cause an increase in temperature and stress natural systems, such as oceans and the hydrologic cycle. Climate changes that may affect Mojave Region water resources include:

- **Higher Temperatures and Heat Waves:** that increase demand for water, especially for agricultural and residential irrigation uses.
- **Water Uncertainty:** A projected overall decrease in precipitation levels coupled with more intense individual storm events may lead to increased flooding. This could be exacerbated in the Mojave River channel, because subsidence behind some of the river banks could reduce their effectiveness. In addition, increasing development along the Mojave River leads to increased flood risk for developing areas that are located within a floodplain. Higher temperatures that may cause more precipitation to fall as rain rather than snow, hasten snowmelt and increase runoff, which will affect water storage planning. Increased evaporation will create a generally drier climate, with wildfires likely to increase and groundwater basins likely to receive less replenishment (USBR??, 2013).

Chapter 13 describes potential effects of climate change on Mojave Region agencies and IRWM planning in more detail.

Comment [SC2]: K/J will revise these highlights once we get final report from the Bureau.

4.2.9 Mojave Stipulated Judgment and Water Rights

The key issues, needs, challenges, and priorities for the Mojave Region with respect to the Mojave Basin Area Judgment and water rights include the following, which are discussed in greater detail below:

- Questions about purchases of water rights;
- Look at effects caused by upstream activities on downstream users;
- Consider economic impacts on rural communities;
- Pumping water outside the Mojave Basin Area Judgment. This is associated with new producers that were not in existence at the time the adjudication was completed.

The Adjudication of the Mojave Basin Area was the legal process that allocated the right to produce water from the available natural water supply. The Riverside Superior Court bound the stipulating parties (users who signed the agreement and agreed with the adjudication) to the Stipulated Judgment in September 1993 and further bound the non-stipulating parties to the terms of the Stipulated Judgment in January 1996 following trial. The Court appointed MWA as Watermaster of the Mojave Basin Area.

Some of the non-stipulating parties appealed the Judgment of the Superior Court and the Appellate Court issued a final decision in June 1998. The final decision of the Appellate Court held the stipulating parties to the terms of the Stipulated Judgment, but excluded the appealing parties, with the exception of one appellant who sought a revised water production right under the Judgment. MWA requested the California Supreme Court to review the Appellate Court's decision in July 1998. The Supreme Court affirmed the Appellate Court's decision in August 2000, regarding the Stipulated Judgment and the exclusion of the appealing parties from the Judgment, but over-turned the decision of the Appeals Court as to the one party seeking additional production rights. Since 1996, most of the appealing parties have stipulated to the Judgment.

The Stipulated Judgment has left some the Baja Subarea stipulating parties unhappy for several reasons, with many feeling like they were short-changed or misled by supporting the adjudication. This area is primarily an agricultural dry-farming rural community with great pride and loyalty for their land. Because there is no municipal water entity in this Subarea, there is no entity that can afford to buy supplies to backstop the depleting groundwater as the farmers are using it for their current crop needs. The other Subareas have cities and/or water agencies that are providing the necessary funding to purchase the required SWP replenishment water for the Stipulated Judgment as needed, and some for example, charge user fees to fund such purchases. Because of the depletion of storage in the Baja Subarea and the need to stop the overdraft of the Mojave Basin Area, the Subarea's allocation of allowable use is growing smaller or being "ramped down" even further.

The crops grown in Baja are mostly orchards for pistachios and hay crops such as alfalfa, with blight and/or disease occurring in many portions of this Subarea. Some of the stipulating parties in this Subarea believe it is unfair that farmers in the area that did not sign the Stipulated Judgment are not restricted to any water usage allotments and are profiting during this time. Others that purchased farms since the non-stipulating parties were bound to the terms of the

Stipulated Judgment in January 1996 (and therefore, are not restricted) and are using large amounts of water are also thought to be unfairly profiting.

There was a County of San Bernardino Ordinance 810.0605-810.0610 that was removed in 2007, referred to in a stakeholder meeting as “our protection against unauthorized production.” The stakeholders believe if the County enforced this Ordinance, it would stop water users who are not included in the Stipulated Judgment from using the adjudicated groundwater and are currently trying to get the County to reinstate the Ordinance. Also, the Judgment states that the MWA “Watermaster shall administer and enforce the provisions of the Judgment and any subsequent instructions or orders of this Court.”

4.2.10 Coordination with Neighboring IRWM Plan Region Opportunities

Coordinate with Coachella and Antelope Valley IRWM Plans.

Comment [SC3]: Can someone at MWA do this for us?

4.2.11 Land Subsidence

Another challenge is subsidence (consolidation of the aquifer causing decreased ground levels) due to groundwater pumping. According to U.S. Geological Survey (USGS), pumping of groundwater from the Mojave River and Morongo groundwater basins in the Mojave Region resulted in water-level declines of more than 30 meters (100 feet) between the 1950s and the 1990s (USGS and MWA, 2003).

Interferometric synthetic aperture radar (InSAR) methods were used to determine the location, extent, and magnitude of vertical land-surface changes in the Mojave River and Morongo Groundwater Basins for various time intervals between 1992 and 1999. The interferograms show subsidence ranging from 45 to 90 mm (0.15 to 0.3 ft) in four areas of these two groundwater basins—the El Mirage, Lucerne Valley, Newberry Springs, and Lockhart–Harper Lake (dry) areas.

In all four areas, water-level data indicate that water levels in the 1990s were near or below historically low levels. This decline in groundwater levels can cause land subsidence. In the Lucerne Valley area, about 90 mm (0.3 ft) of subsidence was measured between 1992 and 1999 in an area where ground-water levels declined 30 m (100 ft) between the 1950s and 1993 but stabilized in the mid and late 1990s. Stable groundwater levels and temporally coincident subsidence indicates that fine-grained parts of the aquifer system may be compacting residually, still equilibrating with reduced pressures in the coarser grained parts of the aquifer system caused by groundwater-level declines that occurred prior to 1993 (USGS and MWA, 2003).

Land subsidence results in the following impacts:

- Development of cracks, fissures, sink-like depressions and soft spots;
- Change in natural drainage patterns often resulting in increased areas of flooding or increased erosion;
- Degradation of groundwater quality;

- Permanent reduction in groundwater storage capacity;
- Change in gradient in gravity pipelines (sanitary and storm sewers) often resulting in lost capacity;
- Damage to well casings, pipelines, buildings, roads, railroads, bridges, levees, etc.;
- Costs associated with repairs and rebuilding;
- Costs associated with construction of new facilities such as pumping stations for gradient changes;
- Reduction in land value;
- Lawsuits;
- Increased pumping costs.

4.3 Plan Objectives

At the first stakeholders meeting, the existing IRWM Plan objectives from the 2004 MWA Regional Water Management Plan (2004 RWMP) were presented and new objectives were proposed that met the SMART criteria. The first-draft Plan Objectives were presented at the March 5, 2013 Stakeholder meeting and discussed, reviewed, and refined over the following nine months, leading to the 14 broadly supported Plan Objectives listed below. The Plan Objectives are organized according to the nine (9) major themes identified for the challenges and opportunities.

Given the number of objectives and range of activities needed to meet them, the Project Team and stakeholders decided to prioritize the objectives to help focus efforts during Plan implementation. The Project Team set initial priorities for the objectives by evaluating their *importance* and *urgency*. The *importance* assigned to each objective reflects the significance or consequence to the Region as a whole of satisfying that objective compared with other objectives. The *urgency* assigned to each objective reflects the degree to which that objective warrants speedy attention or action compared with other objectives. The preliminary prioritization was then presented during stakeholder meetings and reviewed, discussed, and refined.

Table 4-2 summarizes the objectives, which are grouped by focus area. Table 4-3 and Figure 4-1 present the objectives according to importance and urgency, showing which have the highest priority.

Table 4-2: Summary of Objectives

Summary of Objective	Importance^(a)	Urgency^(b)
1. Balance average annual future water demands with available future supplies to ensure sustainability throughout the Region between now and the 2035 planning horizon and beyond.	High	High
2. Continue improving regional water use efficiency by implementing a portfolio of conservation actions that are regionally cost-effective.	High	Medium
3. Maintain stability in previously overdrafted groundwater basins and reduce overdraft in groundwater basins experiencing ongoing water table declines.	High	High
4. Address the State policy goal of reducing reliance on the Delta by meeting water demands with alternative sources of supply during times when State Water Project (SWP) supplies are reduced or unavailable due to droughts, outages, environmental and regulatory restrictions, or other reasons.	High	Medium
5. Optimize the use of the Region's water related assets to maximize available supplies to meet projected demands while mitigating against risks. Water related assets to be optimized include financial resources, groundwater storage programs, available imported water supplies, transfer and exchange opportunities, available physical infrastructure, and management policies.	High	Medium
6. Prevent land subsidence throughout the Region.	Low	Low
7. Provide support and assistance to disadvantaged communities and help facilitate projects and programs that benefit those communities.	High	High
8. Improve environmental stewardship related to waterways and water management in the Region.	High	Medium
9. Improve floodplain management throughout the Plan area.	High	Medium
10. Preserve water quality as it relates to local beneficial uses of water supplied by each source, including groundwater, stormwater, surface water, imported water, and recycled water.	High	Medium
11. Obtain financial assistance from outside sources to help implement this Plan across a range of project sizes during the planning horizon.	High	Medium
12. Improve public awareness of water supply, conservation, water quality, and environmental stewardship challenges and opportunities throughout the planning horizon.	High	Medium

Summary of Objective	Importance^(a)	Urgency^(b)
13. Identify and establish reliable funding sources to maintain, modernize and improve water infrastructure to ensure a high quality, resilient and reliable water supply.	Medium	Medium
14. Increase the use of recycled water in the Region while maintaining compliance with the Mojave Basin Area Judgment as applicable.	Medium	Medium

Notes:

- (a) The "importance" assigned to each objective reflects the significance or consequence to the Region of satisfying this objective compared with other objectives.
- (b) The "urgency" assigned to each objective reflects the degree to which this objective warrants speedy attention or action compared with other objectives.

Table 4-3: Objectives Arranged by Importance/Urgency

Summary of Objective		Importance^(a)	Urgency^(b)
Tier 1 Priority Objectives			
1.	Balance average annual future water demands with available future supplies to ensure sustainability throughout the Region between now and the 2035 planning horizon and beyond.	High	High
3.	Maintain stability in previously overdrafted groundwater basins and reduce overdraft in groundwater basins experiencing ongoing water table declines.	High	High
7.	Provide support and assistance to disadvantaged communities and help facilitate projects and programs that benefit those communities.	High	High
Tier 2 Priority Objectives			
2.	Continue improving regional water use efficiency by implementing a portfolio of conservation actions that are regionally cost-effective.	High	Medium
4.	Address the State policy goal of reducing reliance on the Delta by meeting water demands with alternative sources of supply during times when State Water Project (SWP) supplies are reduced or unavailable due to droughts, outages, environmental and regulatory restrictions, or other reasons.	High	Medium
5.	Optimize the use of the Region's water related assets to maximize available supplies to meet projected demands while mitigating against risks. Water related assets to be optimized include financial resources, groundwater storage programs, available imported water supplies, transfer and exchange opportunities, available physical infrastructure, and management policies.	High	Medium
8.	Improve environmental stewardship related to waterways and water management in the Region.	High	Medium
9.	Improve floodplain management throughout the Plan area.	High	Medium
10.	Preserve water quality as it relates to local beneficial uses of water supplied by each source, including groundwater, stormwater, surface water, imported water, and recycled water.	High	Medium
11.	Obtain financial assistance from outside sources to help implement this Plan across a range of project sizes during the planning horizon.	High	Medium
12.	Improve public awareness of water supply, conservation, water quality, and environmental stewardship challenges and opportunities throughout the planning horizon.	High	Medium
Tier 3 Priority Objectives			

Summary of Objective	Importance^(a)	Urgency^(b)
13. Identify and establish reliable funding sources to maintain, modernize and improve water infrastructure to ensure a high quality, resilient and reliable water supply.	Medium	Medium
14. Increase the use of recycled water in the Region while maintaining compliance with the Mojave Basin Area Judgment as applicable.	Medium	Medium
Tier 4 Priority Objectives		
6. Prevent land subsidence throughout the Region.	Low	Low

Notes:

- (a) The "importance" assigned to each objective reflects the significance or consequence to the Region of satisfying this objective compared with other objectives.
- (b) The "urgency" assigned to each objective reflects the degree to which this objective warrants speedy attention or action compared with other objectives.

**FIGURE 4-1
PLAN OBJECTIVES ARRANGED BY PRIORITY**

Urgency	High	Tier 2	Tier 1	Tier 1 Obj. 1 - Balance Supply & Demand Obj. 3 – Maintain Stable GW Basins Obj. 7 – Support & Assist DACs
	Medium	Tier 3	Tier 3 Obj. 13 – Establish Reliable Maintenance Funding Obj. 14 – Increase Use of Recycled Water	Tier 2 Obj. 2 – Improve Water Use Efficiency Obj. 4 – Reduce Reliance on Delta Obj. 5 – Optimize Use of Assets Obj. 8 – Improve Environmental Stewardship Obj. 9 – Improve Floodplain Mgmt. Obj. 10 – Preserve Water Quality Obj. 11 – Obtain Financial Assistance Obj. 12 – Improve Public Awareness
	Low	Tier 4 Obj. 6 – Prevent Land Subsidence	Tier 3	Tier 2
		Low	Medium	High
		Importance		

4.3.1 Plan Objectives Qualitative and Quantitative Measurements

The narrative that follows presents the full statement of each objective, along with how to qualitatively and quantitatively measure whether it has been accomplished.

1. Balance average annual future water demands with available future supplies to ensure sustainability throughout the Region between now and the 2035 planning horizon and beyond.
 - a. Measured by forecasted average annual demand (adjusted by expected levels of conservation) at different times through the planning period compared with forecasted average annual available water supplies at different times through planning period.
2. Continue improving regional water use efficiency by implementing a portfolio of conservation actions that are regionally cost-effective.
 - a. Continue reducing urban per-capita water use through all available actions that are regionally cost-effective. Measured by time series of annual per-capita water use.
 - b. Increase agricultural water use efficiency by moving towards efficient water management practices for sustainable agriculture. Measured by the number of farms utilizing viable best management practices, including irrigation practices, equipment, and crop types.
 - c. Increase industrial water use efficiency by moving towards applicable best management practices. Measured by the number of industries utilizing viable best water conserving management practices, equipment and technologies.
3. Maintain stability in previously overdrafted groundwater basins and reduce overdraft in groundwater basins experiencing ongoing water table declines.
 - a. Measured by long-term stability of groundwater levels in the regional monitoring well network and mass water balance calculations by subarea.
4. Address the State policy goal of reducing reliance on the Delta by meeting water demands with alternative sources of supply during times when State Water Project (SWP) supplies are reduced or unavailable due to droughts, outages, environmental and regulatory restrictions, or other reasons.
 - a. Measured by comparing banked or reserve water supplies with water needs to meet a 6-year drought or 3-year outage on the SWP.
5. Optimize the use of the Region's water related assets to maximize available supplies to meet projected demands while mitigating against risks. Water related assets to be optimized include financial resources, groundwater storage programs, available imported water supplies, transfer and exchange opportunities, available physical infrastructure, and management policies.

- a. Measured by available SWP supplies stored, used locally, transferred or exchanged vs. available SWP supplies unused or lost.
 - b. Measured by financial resources that originate outside of the Region and are made available to improve integrated water management within the Region.
 - c. Measured by long-term cost savings created by improvements in operational efficiency, reduced energy consumption, reduced system failures and repairs, etc.
6. Prevent land subsidence throughout the Region.
- a. Measured by monitoring land surface changes, every five years, in areas of known historic subsidence.
7. Provide support and assistance to disadvantaged communities and help facilitate projects and programs that benefit those communities.
- a. Measured by the number of projects and programs implemented and the investments made on an ongoing basis that benefit disadvantaged communities.
8. Improve environmental stewardship¹ related to waterways and water management in the Region.
- a. Measured by acres of sensitive environmental/habitat areas restored or new sensitive environmental/habitat areas set aside for protection.
 - b. Measured by the number of new recreational or educational projects that are connected to environmental stewardship programs.
 - c. Measured by protection and restoration of riparian habitat areas as identified in Exhibit H of the Mojave Basin Area Judgment.
9. Improve floodplain management throughout the Plan area.
- a. Increase coordination between agencies to establish programs and projects related to floodplain management that have multiple benefits/multiple uses. Measured by the number of new multi-benefit/multi-use floodplain projects or programs established.
 - b. Coordination between multiple agencies to reduce risk of flood damage through proactive operations along the flood prone areas. Measured by reduction in monetary impact of flood damage compared to damage caused by historical floods of similar magnitude.
10. Preserve water quality as it relates to local beneficial uses of water supplied by each source, including groundwater, stormwater, surface water, imported water, wastewater, and recycled water.

¹ Environmental stewardship is defined here as a commitment to manage and protect natural resources and ecosystems in a sustainable manner that ensures they are available for future generations.

- a. Measured by policies and programs culminating from regional collaboration of multiple stakeholders resulting in sound public policies that protect water quality.
 - b. Regular summaries of key water quality constituents for various water supplies as they relate to the local beneficial uses.
11. Obtain financial assistance from outside sources to help implement this Plan across a range of project sizes during the planning horizon.
- a. Obtain outside financial assistance for small water systems², measured by the number of small systems that acquired outside funding and the amount of funding acquired.
 - b. Obtain outside financial assistance for other projects and programs (not within small water systems), measured by the amount of outside funds acquired.
12. Improve public awareness of water supply, conservation, water quality, and environmental stewardship challenges and opportunities throughout the planning horizon.
- a. Measured by the results of regular surveys that gauge awareness regarding these topics.
 - b. Measured by documented outreach to all stakeholder types as listed in the IRWM guidelines.
 - c. Measured by the number of new recreational or educational projects that are connected with environmental stewardship efforts.
13. Identify and establish reliable funding sources to maintain, modernize and improve water infrastructure to ensure a high quality, resilient and reliable water supply.
- a. Measured regularly by the estimated cost of deferred maintenance.
 - b. Measured by the number of water systems that improve operations to withstand or reduce the number of system failures and improve system efficiencies.
14. Increase the use of recycled water in the Region while maintaining compliance with the Mojave Basin Area Judgment as applicable.
- a. Measured by changes in the volume of recycled water being used in the Region.

4.3.2 Prioritized Climate Change Vulnerabilities

(Still to do in a Stakeholders meeting in 2014.)

² For the purposes of measuring benefit towards this objective, water systems will be considered "small" if they deliver less than 3,000 AF per year or have fewer than 3,000 service connections.

4.4 References

Comment [SC4]: Still to check.

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