APPENDICES A - M

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Appendix A: Council Resolution Adopting 2015 UWMP

City of Calexico 2015 Urban Water Management Plan

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PENDING; TO BE INCLUDED IN FINAL 2015 UWMP

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Appendix B: UWMP Act

City of Calexico 2015 Urban Water Management Plan

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CALIFORNIA WATER CODE DIVISION 6
PART 2.6. URBAN WATER MANAGEMENT PLANNING

All California Codes have been updated to include the 2010 Statutes.

CHAPTER 1.	GENERAL DECLARATION AND POLICY	10610-10610.4
CHAPTER 2.	DEFINITIONS	10611-10617
CHAPTER 3.	URBAN WATER MANAGEMENT PLANS	
Article 1.	General Provisions	10620-10621
Article 2.	Contents of Plans	10630-10634
Article 2.5.	Water Service Reliability	10635
Article 3.	Adoption and Implementation of Plans	10640-10645
CHAPTER 4.	MISCELLANEOUS PROVISIONS	10650-10656

WATER CODE
SECTION 10610-10610.4

10610. This part shall be known and may be cited as the "Urban Water Management Planning Act."

10610.2. (a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact

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on water management strategies and supply reliability.
(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

10610.4. The Legislature finds and declares that it is the policy of the state as follows:
(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.
(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.
(c) Urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies.

WATER CODE
SECTION 10611-10617

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.5. "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

10612. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city

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and county, city, regional agency, district, or other public entity.

10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

WATER CODE
SECTION 10620-10621

10620. (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d) (1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

(2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10621. (a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water

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supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

WATER CODE
SECTION 10630-10634

10630. It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

10631. A plan shall be adopted in accordance with this chapter that shall do all of the following:

(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

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(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) (1) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(A) An average water year.

(B) A single dry water year.

(C) Multiple dry water years.

(2) For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses:

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

(A) Water survey programs for single-family residential and multifamily residential customers.

(B) Residential plumbing retrofit.

(C) System water audits, leak detection, and repair.

(D) Metering with commodity rates for all new connections and retrofit of existing connections.

(E) Large landscape conservation programs and incentives.

(F) High-efficiency washing machine rebate programs.

(G) Public information programs.

(H) School education programs.

(I) Conservation programs for commercial, industrial, and institutional accounts.

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(J) Wholesale agency programs.
(K) Conservation pricing.
(L) Water conservation coordinator.
(M) Water waste prohibition.
(N) Residential ultra-low-flush toilet replacement programs.
(2) A schedule of implementation for all water demand management measures proposed or described in the plan.
(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.
(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.
(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:
(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.
(2) Include a cost-benefit analysis, identifying total benefits and total costs.
(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.
(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.
(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.
(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.
(j) For purposes of this part, urban water suppliers that are members of the California Urban Water Conservation Council shall be deemed in compliance with the requirements of subdivisions (f) and (g) by complying with all the provisions of the "Memorandum of Understanding Regarding Urban Water Conservation in California,"

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dated December 10, 2008, as it may be amended, and by submitting the annual reports required by Section 6.2 of that memorandum.

(k) Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

10631.1. (a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

(b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirement under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

10631.5. (a) (1) Beginning January 1, 2009, the terms of, and eligibility for, a water management grant or loan made to an urban water supplier and awarded or administered by the department, state board, or California Bay-Delta Authority or its successor agency shall be conditioned on the implementation of the water demand management measures described in Section 10631, as determined by the department pursuant to subdivision (b).

(2) For the purposes of this section, water management grants and loans include funding for programs and projects for surface water or groundwater storage, recycling, desalination, water conservation, water supply reliability, and water supply augmentation. This section does not apply to water management projects funded by the federal American Recovery and Reinvestment Act of 2009 (Public Law 111-5).

(3) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if the urban water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the water demand management measures. The supplier may request grant or loan funds to implement the water demand management measures to the extent the request is consistent with the eligibility requirements applicable to the water management funds.

(4) (A) Notwithstanding paragraph (1), the department shall

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determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if an urban water supplier submits to the department for approval documentation demonstrating that a water demand management measure is not locally cost effective. If the department determines that the documentation submitted by the urban water supplier fails to demonstrate that a water demand management measure is not locally cost effective, the department shall notify the urban water supplier and the agency administering the grant or loan program within 120 days that the documentation does not satisfy the requirements for an exemption, and include in that notification a detailed statement to support the determination.

(B) For purposes of this paragraph, "not locally cost effective" means that the present value of the local benefits of implementing a water demand management measure is less than the present value of the local costs of implementing that measure.

(b) (1) The department, in consultation with the state board and the California Bay-Delta Authority or its successor agency, and after soliciting public comment regarding eligibility requirements, shall develop eligibility requirements to implement the requirement of paragraph (1) of subdivision (a). In establishing these eligibility requirements, the department shall do both of the following:

(A) Consider the conservation measures described in the Memorandum of Understanding Regarding Urban Water Conservation in California, and alternative conservation approaches that provide equal or greater water savings.

(B) Recognize the different legal, technical, fiscal, and practical roles and responsibilities of wholesale water suppliers and retail water suppliers.

(2) (A) For the purposes of this section, the department shall determine whether an urban water supplier is implementing all of the water demand management measures described in Section 10631 based on either, or a combination, of the following:

(i) Compliance on an individual basis.

(ii) Compliance on a regional basis. Regional compliance shall require participation in a regional conservation program consisting of two or more urban water suppliers that achieves the level of conservation or water efficiency savings equivalent to the amount of conservation or savings achieved if each of the participating urban water suppliers implemented the water demand management measures. The urban water supplier administering the regional program shall provide participating urban water suppliers and the department with data to demonstrate that the regional program is consistent with this clause. The department shall review the data to determine whether the urban water suppliers in the regional program are meeting the eligibility requirements.

(B) The department may require additional information for any determination pursuant to this section.

(3) The department shall not deny eligibility to an urban water supplier in compliance with the requirements of this section that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of

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the agencies participating in the project or plan is not implementing all of the water demand management measures described in Section 10631.

(c) In establishing guidelines pursuant to the specific funding authorization for any water management grant or loan program subject to this section, the agency administering the grant or loan program shall include in the guidelines the eligibility requirements developed by the department pursuant to subdivision (b).

(d) Upon receipt of a water management grant or loan application by an agency administering a grant and loan program subject to this section, the agency shall request an eligibility determination from the department with respect to the requirements of this section. The department shall respond to the request within 60 days of the request.

(e) The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities. In addition, for urban water suppliers that are signatories to the Memorandum of Understanding Regarding Urban Water Conservation in California and submit biennial reports to the California Urban Water Conservation Council in accordance with the memorandum, the department may use these reports to assist in tracking the implementation of water demand management measures.

(f) This section shall remain in effect only until July 1, 2016, and as of that date is repealed, unless a later enacted statute, that is enacted before July 1, 2016, deletes or extends that date.

10631.7. The department, in consultation with the California Urban Water Conservation Council, shall convene an independent technical panel to provide information and recommendations to the department and the Legislature on new demand management measures, technologies, and approaches. The panel shall consist of no more than seven members, who shall be selected by the department to reflect a balanced representation of experts. The panel shall have at least one, but no more than two, representatives from each of the following: retail water suppliers, environmental organizations, the business community, wholesale water suppliers, and academia. The panel shall be convened by January 1, 2009, and shall report to the Legislature no later than January 1, 2010, and every five years thereafter. The department shall review the panel report and include in the final report to the Legislature the department's recommendations and comments regarding the panel process and the panel's recommendations.

10632. (a) The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier:

(1) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions that are applicable to each stage.

(2) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic

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sequence for the agency's water supply.

(3) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

(4) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

(5) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

(6) Penalties or charges for excessive use, where applicable.

(7) An analysis of the impacts of each of the actions and conditions described in paragraphs (1) to (6), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

(8) A draft water shortage contingency resolution or ordinance.

(9) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

(b) Commencing with the urban water management plan update due December 31, 2015, for purposes of developing the water shortage contingency analysis pursuant to subdivision (a), the urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

(c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(e) The projected use of recycled water within the supplier's

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service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

WATER CODE SECTION 10635

10635. (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

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WATER CODE
SECTION 10640-10645

10640. Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630).

The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

10641. An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644. (a) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(b) The department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part. The report prepared by the department shall identify the exemplary elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has submitted its plan to the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

(c) (1) For the purpose of identifying the exemplary elements of the individual plans, the department shall identify in the report those water demand management measures adopted and implemented by specific urban water suppliers, and identified pursuant to Section

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10631, that achieve water savings significantly above the levels established by the department to meet the requirements of Section 10631.5.

(2) The department shall distribute to the panel convened pursuant to Section 10631.7 the results achieved by the implementation of those water demand management measures described in paragraph (1).

(3) The department shall make available to the public the standard the department will use to identify exemplary water demand management measures.

10645. Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

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WATER CODE
SECTION 10650-10656

10650. Any actions or proceedings to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 90 days after filing of the plan or amendment thereto pursuant to Section 10644 or the taking of that action.

10651. In any action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

10653. The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the State Water Resources Control Board and the Public Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan prepared to meet federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the

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"Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26 (commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.

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Appendix C: DWR UWMP Checklist

City of Calexico 2015 Urban Water Management Plan

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Checklist Arranged by Subject

CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location *(Optional Column for Agency Use)*
10620(b)	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.1	**Section 1.1** **Appendix A**
10620(d)(2)	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	Plan Preparation	Section 2.5.2	**Section 1.2** **Appendix L**
10642	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	Plan Preparation	Section 2.5.2	**Section 1.2** **Appendix L**
10631(a)	Describe the water supplier service area.	System Description	Section 3.1	**Sections 1.6 to 1.10**
10631(a)	Describe the climate of the service area of the supplier.	System Description	Section 3.3	**Section 1.9**
10631(a)	Provide population projections for 2020, 2025, 2030, and 2035.	System Description	Section 3.4	**Section 1.10**
10631(a)	Describe other demographic factors affecting the supplier's water management planning.	System Description	Section 3.4	**Section 1.8** **Section 5.2**
10631(a)	Indicate the current population of the service area.	System Description and Baselines and Targets	Sections 3.4 and 5.4	**Section 1.10** **Section 5.6** **Section 5.7** **Section 6.7**
10631(e)(1)	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2	**Section 5.4** **Section 5.5** **Section 5.7**
10631(e)(3)(A)	Report the distribution system water loss for the most recent 12-month period available.	System Water Use	Section 4.3	**Section 5.5** **Section 7.4**
10631.1(a)	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.5	**Section 5.8**
10608.20(b)	Retail suppliers shall adopt a 2020 water use target using one of four methods.	Baselines and Targets	Section 5.7 and App E	**Section 5.6** **Appendix D**
10608.20(e)	Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	Baselines and Targets	Chapter 5 and App E	**Section 5.6** **Appendix E**
10608.22	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.7.2	**Section 5.6** **Appendix E**

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CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location *(Optional Column for Agency Use)*
10608.24(a)	Retail suppliers shall meet their interim target by December 31, 2015.	Baselines and Targets	Section 5.8 and App E	**Section 5.6** **Appendix E**
10608.24(d)(2)	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment.	Baselines and Targets	Section 5.8.2	**N/A** **(no adjust.)**
10608.36	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	Section 5.1	**N/A** **(City is retail)**
10608.40	Retail suppliers shall report on their progress in meeting their water use targets. The data shall be reported using a standardized form.	Baselines and Targets	Section 5.8 and App E	**Section 5.6** **Appendix E**
10631(b)	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, 2030, and 2035.	System Supplies	Chapter 6	**Section 2.3** **Section 2.5**
10631(b)	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2	**Section 2.5.1**
10631(b)(1)	Indicate whether a groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	System Supplies	Section 6.2.2	**Section 2.5.1** **N/A** **City does not use groundwater**
10631(b)(2)	Describe the groundwater basin.	System Supplies	Section 6.2.1	**Section 2.5.1**
10631(b)(2)	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2.2	**Section 2.5.1** **Basin is unajudicated**
10631(b)(2)	For unadjudicated basins, indicate whether or not the department has identified the basin as overdrafted, or projected to become overdrafted. Describe efforts by the supplier to eliminate the long-term overdraft condition.	System Supplies	Section 6.2.3	**Section 2.5.1** **N/A** **City does not use groundwater**
10631(b)(3)	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	System Supplies	Section 6.2.4	**Section 2.5.1** **N/A** **City does not use groundwater**
10631(b)(4)	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Sections 6.2 and 6.9	**Section 2.5.1** **N/A** **City does not use groundwater**
10631(d)	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System Supplies	Section 6.7	**Section 2.5.4**
10631(g)	Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years.	System Supplies	Section 6.8	**Section 2.3** **Section 2.5.1** **Section 6.8**

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CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location *(Optional Column for Agency Use)*
10631(h)	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6	Section 2.5.1 Section 2.5.2
10631(j)	Retail suppliers will include documentation that they have provided their wholesale supplier(s) – if any - with water use projections from that source.	System Supplies	Section 2.5.1	Section 2.2 Section 2.6
10631(j)	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types.	System Supplies	Section 2.5.1	N/A City is retail
N/A	For wastewater and recycled water, coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.1	Section 3.4 Section 3.5
10633(a)	Describe the wastewater collection and treatment systems in the supplier's service area. Include quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	System Supplies (Recycled Water)	Section 6.5.2	Section 3.2 Section 3.3
10633(b)	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	System Supplies (Recycled Water)	Section 6.5.2.2	Section 3.3 Section 3.4
10633(c)	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.3 and 6.5.4	Section 3.3 Section 3.4
10633(d)	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.5.4	Section 3.4
10633(e)	Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	System Supplies (Recycled Water)	Section 6.5.4	Section 3.4
10633(f)	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year.	System Supplies (Recycled Water)	Section 6.5.5	Section 3.4
10633(g)	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.5	Section 3.4
10620(f)	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.4	Section 2.2 Section 2.5 Section 2.6 Section 7 Section 8
10631(c)(1)	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage.	Water Supply Reliability Assessment	Section 7.1	Section 6 Section 6.7
10631(c)(1)	Provide data for an average water year, a single dry water year, and multiple dry water years	Water Supply Reliability Assessment	Section 7.2	Section 6.7

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CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location *(Optional Column for Agency Use)*
10631(c)(2)	For any water source that may not be available at a consistent level of use, describe plans to supplement or replace that source.	Water Supply Reliability Assessment	Section 7.1	**Section 2.5**
10634	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Section 7.1	**Section 4**
10635(a)	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years.	Water Supply Reliability Assessment	Section 7.3	**Section 6.7**
10632(a) and 10632(a)(1)	Provide an urban water shortage contingency analysis that specifies stages of action and an outline of specific water supply conditions at each stage.	Water Shortage Contingency Planning	Section 8.1	**Section 8.5**
10632(a)(2)	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency.	Water Shortage Contingency Planning	Section 8.9	**Section 8.8**
10632(a)(3)	Identify actions to be undertaken by the urban water supplier in case of a catastrophic interruption of water supplies.	Water Shortage Contingency Planning	Section 8.8	**Section 7.4** **Section 8.4** **Section 8.5**
10632(a)(4)	Identify mandatory prohibitions against specific water use practices during water shortages.	Water Shortage Contingency Planning	Section 8.2	**Section 7.4** **Section 8.5**
10632(a)(5)	Specify consumption reduction methods in the most restrictive stages.	Water Shortage Contingency Planning	Section 8.4	**Section 8.5**
10632(a)(6)	Indicated penalties or charges for excessive use, where applicable.	Water Shortage Contingency Planning	Section 8.3	**Section 8.5**
10632(a)(7)	Provide an analysis of the impacts of each of the actions and conditions in the water shortage contingency analysis on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts.	Water Shortage Contingency Planning	Section 8.6	**Section 8.7**
10632(a)(8)	Provide a draft water shortage contingency resolution or ordinance.	Water Shortage Contingency Planning	Section 8.7	**Section 8.5** **Appendix H**
10632(a)(9)	Indicate a mechanism for determining actual reductions in water use pursuant to the water shortage contingency analysis.	Water Shortage Contingency Planning	Section 8.5	**Section 8.6**
10631(f)(1)	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Sections 9.2 and 9.3	**Section 7.3** **Section 7.4**

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CWC Section	UWMP Requirement	Subject	Guidebook Location	UWMP Location *(Optional Column for Agency Use)*
10631(f)(2)	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	Sections 9.1 and 9.3	**N/A** **City is retail**
10631(i)	CUWCC members may submit their 2013-2014 CUWCC BMP annual reports in lieu of, or in addition to, describing the DMM implementation in their UWMPs. This option is only allowable if the supplier has been found to be in full compliance with the CUWCC MOU.	Demand Management Measures	Section 9.5	**Section 7.4** **Appendix I**
10608.26(a)	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets.	Plan Adoption, Submittal, and Implementation	Section 10.3	**Section 1.2** **Appendix A** **Appendix L**
10621(b)	Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.	Plan Adoption, Submittal, and Implementation	Section 10.2.1	**Section 1.2** **Appendix L**
10621(d)	Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.	Plan Adoption, Submittal, and Implementation	Sections 10.3.1 and 10.4	**Section 1.2** **Appendix A** **Appendix L**
10635(b)	Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 60 days after the submission of the plan to DWR.	Plan Adoption, Submittal, and Implementation	Section 10.4.4	**Section 1.2** **Appendix H** **http://www.calexico.ca.gov**
10642	Provide supporting documentation that the urban water supplier made the plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan.	Plan Adoption, Submittal, and Implementation	Sections 10.2.2, 10.3, and 10.5	**Section 1.2** **Appendix L**
10642	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Sections 10.2.1	**Section 1.2** **Appendix L**
10642	Provide supporting documentation that the plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3.1	**Section 1.2** **Appendix A**
10644(a)	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.4.3	**Section 1.2** **Appendix L**
10644(a)(1)	Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Plan Adoption, Submittal, and Implementation	Section 10.4.4	**Section 1.2** **Appendix L**
10644(a)(2)	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Sections 10.4.1 and 10.4.2	**PENDING**
10645	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hrs.	Plan Adoption, Submittal, and Implementation	Section 10.5	**Section 1.2** **http://www.calexico.ca.gov**

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Appendix D: DWR UWMP Data Tables

City of Calexico 2015 Urban Water Management Plan

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Table 2-1 Retail Only: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2015	Volume of Water Supplied 2015
1310002	City of Calexico	8,336	5,753
	TOTAL	8,336	5,753
NOTES: See Section 1.7, 1.8 and Section 2.3			

Table 2-2: Plan Identification			
Select Only One	**Type of Plan**		**Name of RUWMP or Regional Alliance** *if applicable* *drop down list*
☑	**Individual UWMP**		
	☐	Water Supplier is also a member of a RUWMP	
	☐	Water Supplier is also a member of a Regional Alliance	
☐	**Regional Urban Water Management Plan (RUWMP)**		
NOTES: See Sections 1.1, 1.2, 1.3, 1.4, & 1.5			

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Table 2-3: Agency Identification	
Type of Agency (select one or both)	
☐	Agency is a wholesaler
☑	Agency is a retailer
Fiscal or Calendar Year (select one)	
☑	UWMP Tables Are in Calendar Years
☐	UWMP Tables Are in Fiscal Years
If Using Fiscal Years Provide Month and Date that the Fiscal Year Begins (mm/dd)	
Units of Measure Used in UWMP (select from Drop down)	
Unit	AF
NOTES: All units are in acre-feet, unless otherwise specified in Plan.	

Table 2-4 Retail: Water Supplier Information Exchange
The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631.
Wholesale Water Supplier Name *(Add additional rows as needed)*
Imperial Irrigation District
NOTES:

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Table 3-1 Retail: Population - Current and Projected						
Population Served	2015	2020	2025	2030	2035	2040*(opt)*
	40,092	44,967	50,912	56,857	62,802	68,747
NOTES: See Section 1.10						

Table 4-1 Retail: Demands for Potable and Raw Water - Actual			
Use Type *(Add additional rows as needed)*	2015 Actual		
Drop down list *May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool*	Additional Description *(as needed)*	Level of Treatment When Delivered *Drop down list*	Volume
Single Family		Drinking Water	3,058
Multi-Family		Drinking Water	435
Commercial	& Institutional	Drinking Water	689
Industrial		Drinking Water	0
Landscape			468
Other		Drinking Water	0
Losses	Non-Revenue Water	Drinking Water	1,103
		TOTAL	5,753
NOTES: See Section 5.5. Regarding the "losses", City maintains unmetered use for some municipal properties & landscapes in the City that are City-owned.			

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Table 4-2 Retail: Demands for Potable and Raw Water - Projected						
Use Type *(Add additional rows as needed)*	Additional Description *(as needed)*	Projected Water Use *Report To the Extent that Records are Available*				
Drop down list *May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool*		2020	2025	2030	2035	2040-opt
Single Family		4,251	4,814	5,376	5,938	6,500
Multi-Family		613	694	775	856	938
Commercial		863	977	1,091	1,205	1,319
Industrial		1	1	1	1	1
Landscape		398	451	503	556	609
Other	Non-Revenue Water	5	6	7	7	8
Losses		1,524	1,725	1,926	2,128	2,329
	TOTAL	7,655	8,668	9,679	10,691	11,704

NOTES: See Section 5.7. Regarding the "losses", City maintains unmetered use for some municipal properties & landscapes in the City that are City-owned.

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Table 4-3 Retail: Total Water Demands						
	2015	2020	2025	2030	2035	2040 *(opt)*
Potable and Raw Water *From Tables 4-1 and 4-2*	5,753	7,655	8,668	9,679	10,691	11,704
Recycled Water Demand* *From Table 6-4*	0	0	0	0	0	0
TOTAL WATER DEMAND	5,753	7,655	8,668	9,679	10,691	11,704

**Recycled water demand fields will be blank until Table 6-4 is complete.*

NOTES: See Section 3.4 & Table 3.5. See also Section 5.7 & Table 5.7

Table 4-4 Retail: 12 Month Water Loss Audit Reporting	
Reporting Period Start Date (mm/yyyy)	Volume of Water Loss*
01/2015	1,031 AF
** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*	
NOTES: See Section 7.4 & Figure 7.1.	

Table 4-5 Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) *Drop down list (y/n)*	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, etc... utilized in demand projections are found.	Page 5.15
Are Lower Income Residential Demands Included In Projections? *Drop down list (y/n)*	Yes
NOTES: See Section 5.7 & 5.8	

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Table 5-1 Baselines and Targets Summary *Retail Agency or Regional Alliance Only*					
Baseline Period	Start Year	End Year	Average Baseline GPCD*	2015 Interim Target *	Confirmed 2020 Target*
10-15 year	*2001*	*2010*	*180*	*176*	*172*
5 Year	*2003*	*2007*	*181*		
*All values are in Gallons per Capita per Day (GPCD)					
NOTES: See Section 5.6					

Table 5-2: 2015 Compliance *Retail Agency or Regional Alliance Only*								
Actual 2015 GPCD*	2015 Interim Target GPCD*	**Optional Adjustments to 2015 GPCD** Enter "0" if no adjustment is made *From Methodology 8*					2015 GPCD* *(Adjusted if applicable)*	Did Supplier Achieve Targeted Reduction for 2015? Y/N
		Extraordinary Events*	Economic Adjustment*	Weather Normalization*	TOTAL Adjustments*	Adjusted 2015 GPCD*		
128	176	0	0	0	0	128	128	Yes
**All values are in Gallons per Capita per Day (GPCD)*								
NOTES: See Section 5.6								

Table 6-1 Retail: Groundwater Volume Pumped						
☑	Supplier does not pump groundwater. The supplier will not complete the table below.					
Groundwater Type ***Drop Down List*** *May use each category multiple times*	Location or Basin Name	2011	2012	2013	2014	2015
Add additional rows as needed						
Alluvial Basin	Imperial Valley Groundwater Basin	0	0	0	0	0
	TOTAL	0	0	0	0	0
NOTES: See Section 2.5.1						

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Table 6-2 Retail: Wastewater Collected Within Service Area in 2015						
☐	There is no wastewater collection system. The supplier will not complete the table below.					
	Percentage of 2015 service area covered by wastewater collection system *(optional)*					
	Percentage of 2015 service area population covered by wastewater collection system *(optional)*					
Wastewater Collection			Recipient of Collected Wastewater			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated? *Drop Down List*	Volume of Wastewater Collected from UWMP Service Area 2015	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Located Within UWMP Area? *Drop Down List*	Is WWTP Operation Contracted to a Third Party? *(optional)* *Drop Down List*
Add additional rows as needed						
City of Calexico	Metered	2,876	City of Calexico	City Wastewater Treatment Plant	Yes	No
Total Wastewater Collected from Service Area in 2015:		2,876				
NOTES: See Section 3.2						

Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2015										
☐	No wastewater is treated or disposed of within the UWMP service area. The supplier will not complete the table below.									
							2015 volumes			
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)*	Method of Disposal *Drop down list*	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level *Drop down list*	Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area
Add additional rows as needed										
City Wastewater Treatment Plant	City of Calexico	Percolation Ponds & New River		River or creek outfall	No	Secondary, Disinfected - 2.2	2,876	2,876	0	
						Total	2,876	2,876	0	0
NOTES: See Section 3.3 & 3.4										

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Table 6-4 Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area								
☑	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.							
Name of Agency Producing (Treating) the Recycled Water:								
Name of Agency Operating the Recycled Water Distribution System:								
Supplemental Water Added in 2015								
Source of 2015 Supplemental Water								
Beneficial Use Type	General Description of 2015 Uses	Level of Treatment *Drop down list*	2015	2020	2025	2030	2035	2040 (opt)
Agricultural irrigation								
Landscape irrigation (excludes golf courses)								
Golf course irrigation								
Commercial use								
Industrial use								
Geothermal and other energy production								
Seawater intrusion barrier								
Recreational impoundment								
Wetlands or wildlife habitat								
Groundwater recharge (IPR)*								
Surface water augmentation (IPR)*								
Direct potable reuse								
Other *(Provide General Description)*								
		Total:	0	0	0	0	0	0
**IPR - Indirect Potable Reuse*								
NOTES: See Section 3.3 & 3.4								

Table 6-5 Retail: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual			
☑	Recycled water was not used in 2010 nor projected for use in 2015. The supplier will not complete the table below.		
Use Type		**2010 Projection for 2015**	**2015 Actual Use**
Agricultural irrigation			
Landscape irrigation (excludes golf courses)			
Golf course irrigation			
Commercial use			
Industrial use			
Geothermal and other energy production			
Seawater intrusion barrier			
Recreational impoundment			
Wetlands or wildlife habitat			
Groundwater recharge (IPR)			
Surface water augmentation (IPR)			
Direct potable reuse			
Other	*Type of Use*		
	Total	0	0
NOTES: See Section 3.3 & 3.4			

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Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
☑	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
Section 3.4 & 3.5	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use
Add additional rows as needed			
		Total	0
NOTES: See Section 3.4 & 3.5 for narrative.			

Table 6-7 Retail: Expected Future Water Supply Projects or Programs						
☑	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
☐	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
Section 2.3 & 2.5	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other agencies?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type *Drop Down List*	Expected Increase in Water Supply to Agency *This may be a range*
	Drop Down List (y/n)	*If Yes, Agency Name*				
Add additional rows as needed						
NOTES: See Section 2.3 & 2.5 for narrative.						

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Table 6-8 Retail: Water Supplies — Actual

Water Supply	Additional Detail on Water Supply	2015		
Drop down list *May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool*		Actual Volume	Water Quality *Drop Down List*	Total Right or Safe Yield *(optional)*
Add additional rows as needed				
Purchased or Imported Water	Imperial Irr. Dist.	5,753	Raw Water	N/A
	Total	5,753		0

NOTES: See Section 2.2 & 2.3

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Table 6-9 Retail: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Projected Water Supply *Report To the Extent Practicable*									
Drop down list *May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool*		**2020**		**2025**		**2030**		**2035**		**2040** *(opt)*	
		Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*	Reasonably Available Volume	Total Right or Safe Yield *(optional)*
Add additional rows as needed											
Purchased or Imported Water	Imperial Irr. Dist.	15,682	N/A	15,682	N/A	15,682	N/A	15,682	N/A	15,682	N/A
	Total	15,682	0	15,682	0	15,682	0	15,682	0	15,682	0

NOTES: See Section 2.2 & 2.3

Table 7-1 Retail: Basis of Water Year Data			
Year Type	**Base Year** *If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000*	**Available Supplies if Year Type Repeats**	
		☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____	
		☐ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available	**% of Average Supply**
Average Year	N/A	10081	100%
Single-Dry Year	1974	10081	100%
Multiple-Dry Years 1st Year	1996	10081	100%
Multiple-Dry Years 2nd Year	1997	10081	100%
Multiple-Dry Years 3rd Year	1998	10081	100%
Multiple-Dry Years 4th Year *Optional*			
Multiple-Dry Years 5th Year *Optional*			
Multiple-Dry Years 6th Year *Optional*			

Agency may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If an agency uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.

NOTES: Total AVAILABLE supplies are actually 15,682 AFY, based on the capacity of the City's treatment plant. But for the sake of supply v. demand, a conservative volume of 10,081 AFY is used in Section 6 (i.e. treatment plant at 2/3 capacity). Supplies are expected to be fairly "droght-proof" for up to three years since Imperial Irr. has not historically restricted supplies during droughts. SEE SECTION 6 of Plan

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Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040 *(Opt)*
Supply totals *(autofill from Table 6-9)*	15,682	15,682	15,682	15,682	15,682
Demand totals *(autofill from Table 4-3)*	7,655	8,668	9,679	10,691	11,704
Difference	8,027	7,014	6,003	4,991	3,978
NOTES: SEE SECTION 6. This table is awkward not compatible with UWMP. The AVAILABLE capacity/supply of 15,682 AFY is not supposed to be used for conservative planning into the future. Rather, 10,081 AFY (2/3 capacity) and 14,000 AFY (90% capacity) is used in Section 6.					

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Table 7-3 Retail: Single Dry Year Supply and Demand Comparison					
	2020	2025	2030	2035	2040 (Opt)
Supply totals	10,081	10,081	10,081	14,000	14,000
Demand totals	7,901	8946	9,990	11,035	12,080
Difference	2,180	1,135	91	2,965	1,920
NOTES: Comparison Above is for POTABLE supplies. See Section 6.5 & Tables 6.3 to 6.9					

Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison						
		2020	2025	2030	2035	2040 (Opt)
First year	Supply totals	10,081	10,081	10,081	14,000	14,000
	Demand totals	7,389	8,420	9,452	10,483	11,515
	Difference	2,692	1,661	629	3,517	2,485
Second year	Supply totals	10,081	10,081	10,081	14,000	14,000
	Demand totals	7,595	8,627	9,658	10,690	11,721
	Difference	2,486	1,454	423	3,310	2,279
Third year	Supply totals	10,081	10,081	10,081	14,000	14,000
	Demand totals	7,756	8,781	9,806	10,832	11,857
	Difference	2,325	1,300	275	3,168	2,143
Fourth year *(optional)*	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0
Fifth year *(optional)*	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0
Sixth year *(optional)*	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0

NOTES: This table just not does fit right and is not fully compatible with the City's UWMP. SEE SECTION 6 of UWMP. Multiple Dry Years for 2020 above are 2018, 2019, 2020. Multiple dry years for 2025 above are 2023, 2024, 2025. Multiple Dry Years for 2030 above are 2028, 2029, & 2030. Multiple Dry Years for 2035 above are 2033, 2034, & 2035.

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Table 8-1 Retail Stages of Water Shortage Contingency Plan		
Stage	Complete Both	
	Percent Supply Reduction[1] *Numerical value as a percent*	Water Supply Condition (*Narrative description)*
Add additional rows as needed		
1	15%	Supply anticipated to be 80% of normal
2	25%	Supply anticipated to be 75% of normal
3	35%	Supply anticipated to be 65% of normal
4	50%	Supply anticipated to be 50% of normal
[1] *One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.*		
NOTES: See Section 8.5		

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Table 8-2 Retail Only: Restrictions and Prohibitions on End Uses			
Stage	Restrictions and Prohibitions on End Users ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? *Drop Down List*
Add additional rows as needed			
Level 2	Other - Prohibit use of potable water for washing hard surfaces		Yes
Level 2	CII - Restaurants may only serve water upon request		Yes
Level 2	Landscape - Other landscape restriction or prohibition		Yes
Permanent	Other - Customers must repair leaks, breaks, and malfunctions in a timely manner		Yes
Level 2	Landscape - Limit landscape irrigation to specific days		Yes
Level 2	Other - Prohibit vehicle washing except at facilities using recycled or recirculating water		Yes
Level 2	Landscape - Restrict or prohibit runoff from landscape irrigation		Yes
Level 2	Landscape - Limit landscape irrigation to specific times		Yes
Level 2	Landscape - Prohibit certain types of landscape irrigation		Yes
Level 2	Water Features - Restrict water use for decorative water features, such as fountains		Yes
NOTES: See Section 8.5			

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Table 8-3 Retail Only: Stages of Water Shortage Contingency Plan - Consumption Reduction Methods		
Stage	Consumption Reduction Methods by Water Supplier ***Drop down list*** *These are the only categories that will be accepted by the WUEdata online submittal tool*	Additional Explanation or Reference *(optional)*
Add additional rows as needed		
All	Expand Public Information Campaign	
All	Improve Customer Billing	
All	Increase Frequency of Meter Reading	
All	Offer Water Use Surveys	
All	Implement or Modify Drought Rate Structure or Surcharge	City already has rates which penalize excessive use
All	Provide Rebates on Plumbing Fixtures and Devices	Rebate programs no longer offered through City or Imperial Irr. Dist. Market was saturated and funding went dry.
Level 2	Moratorium or Net Zero Demand Increase on New Connections	City will accept applications for development but will not issue permits until water shortage is remediated
All	Provide Rebates for Turf Replacement	Rebates offered via Imperial Irr. Dist.
All	Provide Rebates for Landscape Irrigation Efficiency	
NOTES: See Section 8.5 for narrative.		

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Table 8-4 Retail: Minimum Supply Next Three Years			
	2016	2017	2018
Available Water Supply	9,790	9,992	10,195
NOTES: See Section 8.8			

Table 10-1 Retail: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
City of Calexico (& residents)	☑	☑
Imperial Irrigation District	☑	☐
City of Brawley	☑	☐
City of El Centro	☑	☐
City of Imperial	☑	☐
County Name *Drop Down List*	60 Day Notice	Notice of Public Hearing
Add additional rows as needed		
Imperial County	☑	☐
Note: See Section 1.2 and Appendix L		

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Appendix E: DWR SBx7-7 Data Tables

City of Calexico 2015 Urban Water Management Plan

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SB X7-7 Table 0: Units of Measure Used in UWMP* *(select one from the drop down list)*
Acre Feet
**The unit of measure must be consistent with Table 2-3*
NOTES:

SB X7-7 Table-1: Baseline Period Ranges			
Baseline	**Parameter**	**Value**	**Units**
10- to 15-year baseline period	2008 total water deliveries	6,603	Acre Feet
	2008 total volume of delivered recycled water	-	Acre Feet
	2008 recycled water as a percent of total deliveries	0.00%	Percent
	Number of years in baseline period[1, 2]	10	Years
	Year beginning baseline period range	2001	
	Year ending baseline period range[3]	2010	
5-year baseline period	Number of years in baseline period	5	Years
	Year beginning baseline period range	2003	
	Year ending baseline period range[4]	2007	
[1]If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period. [2] The Water Code requires that the baseline period is between 10 and 15 years. However, DWR recognizes that some water suppliers may not have the minimum 10 years of baseline data.			
[3]The ending year must be between December 31, 2004 and December 31, 2010.			
[4]The ending year must be between December 31, 2007 and December 31, 2010.			
NOTES: See Section 5.6			

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SB X7-7 Table 2: Method for Population Estimates	
Method Used to Determine Population (may check more than one)	
☑	**1. Department of Finance** (DOF) DOF Table E-8 (1990 - 2000) and (2000-2010) and DOF Table E-5 (2011 - 2015) when available
☐	**2. Persons-per-Connection Method**
☐	**3. DWR Population Tool**
☐	**4. Other** DWR recommends pre-review
NOTES: CA DoF population tables were used.	

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SB X7-7 Table 3: Service Area Population		
Year		**Population**
10 to 15 Year Baseline Population		
Year 1	2001	27,866
Year 2	2002	29,425
Year 3	2003	31,497
Year 4	2004	33,499
Year 5	2005	35,056
Year 6	2006	35,485
Year 7	2007	36,013
Year 8	2008	37,306
Year 9	2009	37,999
Year 10	2010	38,572
Year 11		
Year 12		
Year 13		
Year 14		
Year 15		
5 Year Baseline Population		
Year 1	2003	31,497
Year 2	2004	33,499
Year 3	2005	35,056
Year 4	2006	35,485
Year 5	2007	36,013
2015 Compliance Year Population		
2015		40,092
NOTES: See Section 5.6		

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SB X7-7 Table 4: Annual Gross Water Use *

Baseline Year *Fm SB X7-7 Table 3*		Volume Into Distribution System *This column will remain blank until SB X7-7 Table 4-A is completed.*	Deductions					Annual Gross Water Use
			Exported Water	Change in Dist. System Storage (+/-)	Indirect Recycled Water *This column will remain blank until SB X7-7 Table 4-B is completed.*	Water Delivered for Agricultural Use	Process Water *This column will remain blank until SB X7-7 Table 4-D is completed.*	
10 to 15 Year Baseline - Gross Water Use								
Year 1	2001	7,023	-	-	-	-	-	7,023
Year 2	2002	7,021	-	-	-	-	-	7,021
Year 3	2003	7,021	-	-	-	-	-	7,021
Year 4	2004	7,017	-	-	-	-	-	7,017
Year 5	2005	7,029	-	-	-	-	-	7,029
Year 6	2006	6,876	-	-	-	-	-	6,876
Year 7	2007	6,737	-	-	-	-	-	6,737
Year 8	2008	6,603	-	-	-	-	-	6,603
Year 9	2009	6,555	-	-	-	-	-	6,555
Year 10	2010	6,178	-	-	-	-	-	6,178
Year 11	0	-			-		-	-
Year 12	0	-			-		-	-
Year 13	0	-			-		-	-
Year 14	0	-			-		-	-
Year 15	0	-			-		-	-
10 - 15 year baseline average gross water use								**6,806**
5 Year Baseline - Gross Water Use								
Year 1	2003	7,021	-	-	-	-	-	7,021
Year 2	2004	7,017	-	-	-	-	-	7,017
Year 3	2005	7,029	-	-	-	-	-	7,029
Year 4	2006	6,876	-	-	-	-	-	6,876
Year 5	2007	6,737	-	-	-	-	-	6,737
5 year baseline average gross water use								**6,936**
2015 Compliance Year - Gross Water Use								
2015		5,753	-	-	-	-	-	**5,753**

* NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3

NOTES: See Section 5.6

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SB X7-7 Table 4-A: Volume Entering the Distribution System(s)

Complete one table for each source.

Name of Source	All Sources: Imperial Irr. Dist.
This water source is:	
☐	The supplier's own water source
☑	A purchased or imported source

Baseline Year *Fm SB X7-7 Table 3*		Volume Entering Distribution System	Meter Error Adjustment* *Optional (+/-)*	Corrected Volume Entering Distribution System
10 to 15 Year Baseline - Water into Distribution System				
Year 1	2001	7,023		7,023
Year 2	2002	7,021		7,021
Year 3	2003	7,021		7,021
Year 4	2004	7,017		7,017
Year 5	2005	7,029		7,029
Year 6	2006	6,876		6,876
Year 7	2007	6,737		6,737
Year 8	2008	6,603		6,603
Year 9	2009	6,555		6,555
Year 10	2010	6,178		6,178
Year 11	0			-
Year 12	0			-
Year 13	0			-
Year 14	0			-
Year 15	0			-
5 Year Baseline - Water into Distribution System				
Year 1	2003	7,021		7,021
Year 2	2004	7,017		7,017
Year 3	2005	7,029		7,029
Year 4	2006	6,876		6,876
Year 5	2007	6,737		6,737
2015 Compliance Year - Water into Distribution System				
2015		5,753		5,753

** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES: See Section 5.6

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SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD)				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Annual Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use (GPCD)
10 to 15 Year Baseline GPCD				
Year 1	2001	27,866	7,023	225
Year 2	2002	29,425	7,021	213
Year 3	2003	31,497	7,021	199
Year 4	2004	33,499	7,017	187
Year 5	2005	35,056	7,029	179
Year 6	2006	35,485	6,876	173
Year 7	2007	36,013	6,737	167
Year 8	2008	37,306	6,603	158
Year 9	2009	37,999	6,555	154
Year 10	2010	38,572	6,178	143
Year 11	0	-	-	
Year 12	0	-	-	
Year 13	0	-	-	
Year 14	0	-	-	
Year 15	0	-	-	
10-15 Year Average Baseline GPCD				**180**
5 Year Baseline GPCD				
Baseline Year *Fm SB X7-7 Table 3*		Service Area Population *Fm SB X7-7 Table 3*	Gross Water Use *Fm SB X7-7 Table 4*	Daily Per Capita Water Use
Year 1	2003	31,497	7,021	199
Year 2	2004	33,499	7,017	187
Year 3	2005	35,056	7,029	179
Year 4	2006	35,485	6,876	173
Year 5	2007	36,013	6,737	167
5 Year Average Baseline GPCD				**181**
2015 Compliance Year GPCD				
2015		40,092	5,753	**128**

NOTES: See Section 5.6

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SB X7-7 Table 6: Gallons per Capita per Day *Summary From Table SB X7-7 Table 5*	
10-15 Year Baseline GPCD	180
5 Year Baseline GPCD	181
2015 Compliance Year GPCD	128
NOTES: See Section 5.6	

SB X7-7 Table 7: 2020 Target Method *Select Only One*		
Target Method		Supporting Documentation
☐	Method 1	SB X7-7 Table 7A
☐	Method 2	SB X7-7 Tables 7B, 7C, and 7D *Contact DWR for these tables*
☑	Method 3	SB X7-7 Table 7-E
☐	Method 4	Method 4 Calculator
NOTES: See Section 5.6		

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SB X7-7 Table 7-A: Target Method 1 20% Reduction	
10-15 Year Baseline GPCD	**2020 Target GPCD**
180	**144**
NOTES: See Section 5.6	

SB X7-7 Table 7-E: Target Method 3				
Agency May Select More Than One as Applicable	Percentage of Service Area in This Hydrological Region	Hydrologic Region	"2020 Plan" Regional Targets	Method 3 Regional Targets (95%)
☐		North Coast	137	130
☐		North Lahontan	173	164
☐		Sacramento River	176	167
☐		San Francisco Bay	131	124
☐		San Joaquin River	174	165
☐		Central Coast	123	117
☐		Tulare Lake	188	179
☐		South Lahontan	170	162
☐		South Coast	149	142
☑	100%	Colorado River	211	200
Target *(If more than one region is selected, this value is calculated.)*				**200**
NOTES:				

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SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target			
5 Year Baseline GPCD *From SB X7-7 Table 5*	Maximum 2020 Target[1]	Calculated 2020 Target[2]	**Confirmed 2020 Target**
181	172	183	**172**

[1] Maximum 2020 Target is 95% of the 5 Year Baseline GPCD except for suppliers at or below 100 GPCD.

[2] 2020 Target is calculated based on the selected Target Method, see SB X7-7 Table 7 and corresponding tables for agency's calculated target.

NOTES: See Section 5.6

SB X7-7 Table 8: 2015 Interim Target GPCD		
Confirmed 2020 Target *Fm SB X7-7 Table 7-F*	10-15 year Baseline GPCD *Fm SB X7-7 Table 5*	**2015 Interim Target GPCD**
172	180	**176**

NOTES: See Section 5.6

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SB X7-7 Table 9: 2015 Compliance								
		Optional Adjustments *(in GPCD)*						
		Enter "0" if Adjustment Not Used						
Actual 2015 GPCD	2015 Interim Target GPCD	Extraordinary Events	Weather Normalization	Economic Adjustment	TOTAL Adjustments	Adjusted 2015 GPCD	2015 GPCD *(Adjusted if applicable)*	**Did Supplier Achieve Targeted Reduction for 2015?**
128	176	-	-	-	-	128	128	**YES**

NOTES: See Section 5.6 & Appendix D

Appendix F: Land Use Element – 2015 City General Plan

City of Calexico 2015 Urban Water Management Plan

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2.0 LAND USE ELEMENT

City of Calexico

Draft Land Use Element

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DRAFT LAND USE ELEMENT

2.1 INTRODUCTION

2.1.1 Purpose

The purpose of the Land Use Element is to shape the future physical development of Calexico and to preserve, protect and enhance the current livability and quality of life for City residents. The *Land Use Element* is the central element of the General Plan. The distribution, intensity and pattern of land uses provide the most vivid illustration of how the vision for Calexico will be realized. As such, the background, goals, policies, actions and Land Use Map included in this Element provide the basis for many of the policies presented in the other Elements of the City of Calexico General Plan.

California Government Code Section 65302(a) and Public Resources Code Section 2762(a) require the Land Use Element to address the following issues:

- The distribution, location and extent of the uses of land for housing, business, industry, open space, natural resources, recreation and enjoyment of scenic beauty, education, public buildings and grounds, solid and liquid waste disposal facilities and other categories of public and private uses of land.
- Standards of population density and building intensity for land use designations.

The Land Use Element fundamentally seeks to designate sufficient land to accommodate the community's housing needs while also enhancing job opportunities through the identification of land for commercial and industrial enterprises. In so doing, the Land Use Element will meet the mandates of housing element law as well as lead to increased employment and income.

2.1.2 City Background

Calexico, which is a rapidly growing city within Imperial County, is 4 square miles in size and includes 22% of the total population of Imperial County. Between 2000 and 2015, Calexico's population increased by 51%.

Situated on the US/Mexico border, Calexico provides border access between large transportation hubs such as San Francisco, Los Angeles, Phoenix and San Diego and Baja California. Calexico is 680 miles southeast of San Francisco, 230 miles southeast of Los Angeles, 260 miles west of Phoenix, and 122 miles east of San Diego. Calexico shares an international border with the capital of Baja California, Mexicali City, Mexico.

Calexico's key location fuels inevitable population growth as well as the local economy, creating employment and economic opportunities for international and domestic trade.

2.2 EXISTING LAND USE PATTERNS

2.2.1 Residential Land Use

Approximately 10,800 housing units comprise the existing housing stock. Residential build out within the current (summer 2015) City limits would yield almost 7,000 more housing units.

The City's residential neighborhoods are generally clustered in four areas as described below and in the following paragraphs. Exhibit LUE 1 shows the boundaries of the four areas.

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2.2.1.1 Area 1- International Border/All American Canal/State Highway 98/Eastern City Limits

This area includes subdivisions such as Park Paseo, Las Brisas, Rancho Elegante, Valle Real and Villa Santa Fe.

There are several parks that serve the neighborhoods in this area as well as other areas of town: Nosotros, Rio Vista, Legion, Heber, Border, Rockwood, Crummet, Community Center and Gutierrez.

The playing fields located in this area include: Nosotros, Rodriquez, Rivera, Emerson and Rancho Elegante.

The three elementary schools located in this area are Mains, Rockwood and Jefferson. The junior high schools include De Anza and Enrique Camarena. The Calexico High School also is located in Area 1.

2.2.1.2 Area 2 - All American Canal/State Highway 98/ Eastern City Limits

This area includes subdivisions such as Rainbow, Las Haciendas, Rancho Frontera, El Dorado, Meadows, Meadows North, Meadows East and Tierra Santa.

Three parks are located in Area 2: Las Casitas, Rancho Frontera and Joel Riesen.

Also located in Area 2 are the Blanche Charles Elementary School and the William L. Moreno Junior High School.

2.2.1.3 Area 3 - Highway 111/All American Canal/Cole Boulevard/Eastern City Limits

This area includes subdivisions such as Kennedy Gardens, West Meadows Village, Rancho Frontera, Victoria Place, Eastland and Bravo Rodiles.

Four parks are located in Area 3: Kennedy Gardens, Kennedy Gardens Small, Kennedy Gardens Large and Adrian Cordova.

Two elementary schools are located in this area: Kennedy Gardens and Cesar Chavez.

2.2.1.4 Area 4 - Highway 111/Cole Boulevard/Central Main Canal

This area includes the Rancho Las Palmas and La Jolla Palms subdivisions. East of these subdivisions – and within Area 4 – are located the former El Portal area and Las Palmas Mobile Home Park.

The approved Estrella Subdivision and Palazzo Subdivision are located east of Highway 111 and between Jasper Road and the Central Main Canal. The development of almost 2,000 housing units has been approved in these two subdivisions.

Table LUE 1 shows the housing unit projections at build out for residential land located within the City limits. Almost 7,000 housing units will be built in developments under construction and approved as well as on vacant land.

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Exhibit LUE 1
Residential Areas

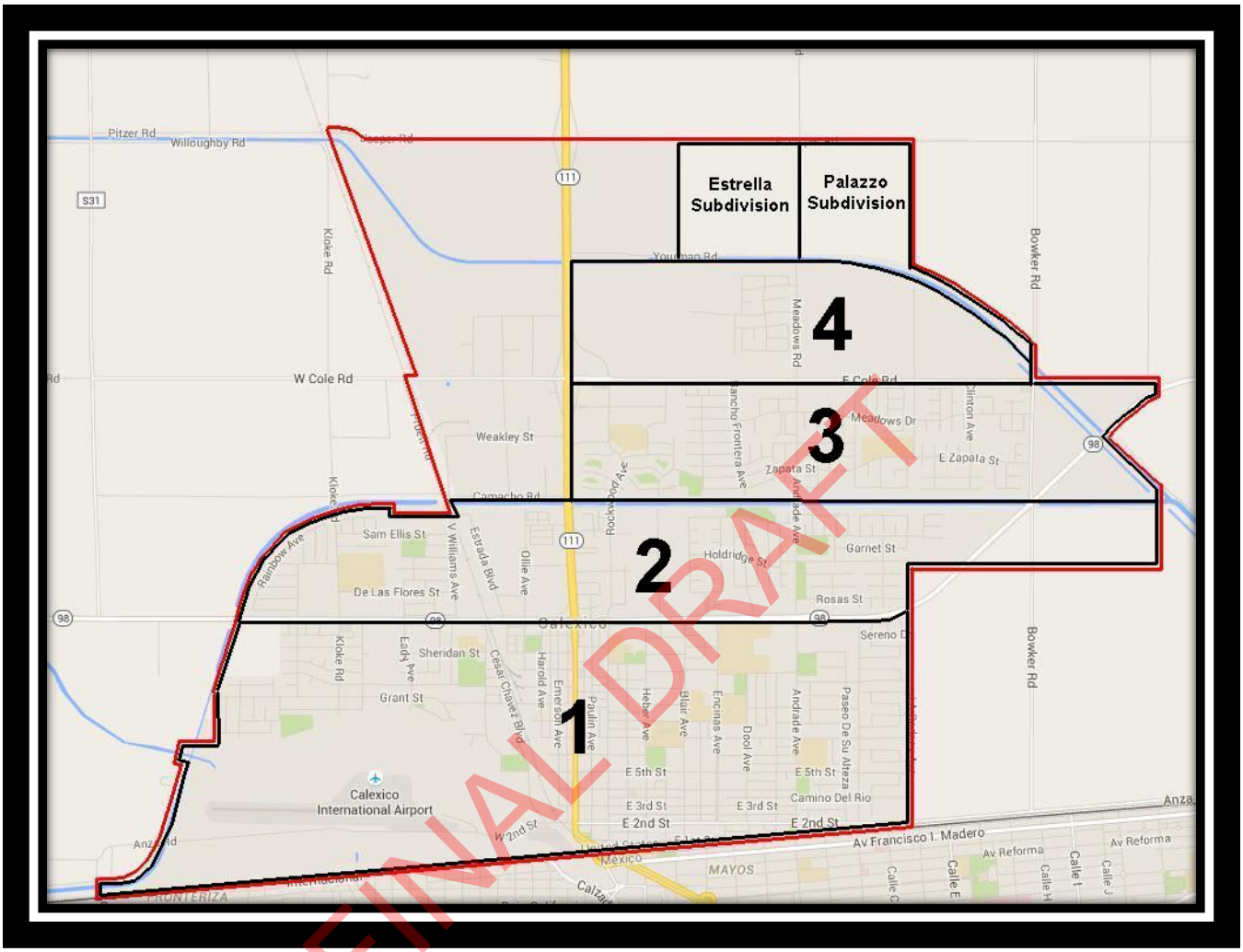

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Table LUE 1
City of Calexico
Housing Unit Projections for Land Located Within City Limits

Project Number	Project Name	Status	Acres	# of SF Units	# of MF Units	Total Units
1	Villa Primavera	Under Construction	2.86	0	48	48
2	Tierrasanta	Under Construction	40.02	129	0	129
3	La Jolla Palms	Under Construction	132.74	331	0	331
Subtotal				**460**	**48**	**508**
4	Venezia	Approved[1]	40.01	249	0	249
5	Remington Condominiums	Approved[1]	20.00	0	272	272
6	Riverview Condominiums	Approved[1]	24.50	0	352	352
7	Las Palmas	Approved[1]	76.00	466	0	466
8	Estrella Subdivision	Approved[1]	96.51 SF 20.03 MF	371	400	771
9	Palazzo Subdivision	Approved[2]	37.47 SF 59.24 MF	276	931	1,207
Subtotal				**1,362**	**1.955**	**3,317**
10	Assessor Parcel Numbers 059-455-001; 059-455-002[3]	Vacant	4.22	0	101	101
11	Assessor Parcel Number 058-832-016	Vacant	6.53	0	156	156
12	Assessor Parcel Numbers 058-853-001; 058-853-002	Vacant	9.85	0	236	236
13	Assessor Parcel Numbers 059-180-003; 059-180-025; 059-180-029; 059-180-035	Vacant	83.25	517	0	517
14	Previous El Portal Project	Vacant	146.38 SF 10.00 MF	526	240	766
15	Assessor Parcel Numbers 059-010-019; 059-010-020	Vacant	33.09	0	794	794
16	Assessor Parcel Numbers 059-010-032; 059-010-037	Vacant	66.0	462	0	462
Subtotal				**1,505**	**1,527**	**3,032**
Grand Total				**3,327**	**3,530**	**6,857**

[1]Approved per Planning Division per the Calexico Development Projects Map, 2011
[2]Approved by City Council on March 6, 2012
[3]059-455-001 = 2.07 acres; 059-455-002 = 2.15 acres
Note:
Total units for MDR sites is based on other existing non mobile home park developments (6.22 dus/ac)
Total units for HDR sites land is calculated at 24 dwelling units per acre
Table construction by Castañeda & Associates

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2.2.2 Commercial Land Use

The main commercial areas within Calexico are identified and discussed below and on the following pages.

2.2.2.1 The California Mayoreo Shopping Center

The shopping center is currently in poor condition. One of the anchor retail spaces (approximately 41,600 square feet) is vacant as are several of the small retail stores. The vacant anchor space was formerly used as a Vons Supermarket. The California Mayoreo grocery is a discount neighborhood grocery store with limited stock and selection. The complex also has adjoining office spaces that have several vacancies. Other businesses within the shopping center include a laundromat, low price apparel and household goods stores, a beauty salon and a tax preparation service.

2.2.2.2 Downtown Calexico

The downtown retail area is predominantly located along East 2nd Street between Imperial Avenue and Mary Avenue. The five block area has a very high density of retail stores. There are also additional retail stores located along 1st Avenue and the connecting Rockwood and Heffernan Avenues. There are also a few retail stores located along 3rd Street. There are two grocery stores operating on 2nd Street. Numerous chain retailers and larger apparel stores also currently operate in Downtown Calexico.

The retail businesses within Downtown Calexico rely on Mexicali residents that cross the border on foot for their primary customer base. Many Mexicali residents cross the border for day excursions to Downtown Calexico. However, some pedestrian visitors use the Wal-Mart-provided shuttle or other bus service to shop at locations outside of the downtown area.

Three projects are underway (summer 2015) in the Downtown that will improve the area and provide additional retail opportunities. The Western Auto building is being renovated for retail activities. Plans have been approved and permits are being issued. In addition, plans have been approved and permits have also been issued for the renovation of the old Melrose building. Plans are also under review for a 19,000 square foot shell building.

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2.2.2.3 Imperial Avenue (California State Route 111) Commercial Corridor

Highway 111 is a north-south four-lane street, which connects El Centro and Brawley with Calexico and the border crossing. As the major thoroughfare, the route experiences high volumes of vehicular traffic particularly on Saturdays. Imperial Avenue is the other main retail area for Calexico.

Most of the businesses on the eastside of the Imperial Avenue closer to the border are small and independent businesses such as restaurants, retailers, and service businesses aimed primarily to serve visitors from Mexicali. The west side has some similar service and restaurant businesses, but also has numerous auto-related repair and part sales businesses.

2.2.2.4 Birch Street/Highway 111 Commercial Corridor

Birch Street, in northern Calexico, marks the beginning of the section of Imperial Avenue where larger and newer retail stores are located. In spring 2009, Forever 21 opened its largest store in

the nation in the location of the former Mervyns (1407 Imperial Avenue), located next to the Food 4 Less discount grocery store. Toyland and Baby World are both located nearby, a few blocks north of the Birch Street intersection.

Further north, the Calexico Wal-Mart Superstore and the neighboring Toys'R'us (2451 Rockwood Avenue) are primary retail destinations. The approximately 219,000-square-foot WalMart Superstore was completed in 2005, replacing the former 118,000 square foot store that was built in 1993 just north along Imperial Avenue (656 Yourman Street). The nearby Big Lots store closed in late 2009.

2.2.2.5 Calexico Grand Plaza Retail Center

Phase 1 opened on November 15, 2013. Gran Plaza will comprise 561,650 square feet of commercial space. The Phase 2 Power Center is the latest phase of the overall Gran Plaza commercial center development, and it will consist of approximately 1,069,400 square feet of floor area within (approximately) 25 buildings, which will be constructed in two phases:

- Phase 2A will consist of approximately 277,000 square feet of floor area and 12 buildings. Phase 2A will be located within the eastern portion of the project site.
- Phase 2B will consist of approximately 13 buildings with a total floor area of 792,400 square feet. Phase 2B will be located in the westerly portion of the site.

Phase 2A is projected to be completed by late 2016. Phase 2B is projected to be completed by late 2017.

2.2.2.6 Additional Commercial Space

Commercial space will be developed in approved projects including 111 Calexico Place, Mega Park, Palazzo, La Jolla Palms, Venezia, and Riverview Condominiums. Additional planned commercial uses include 166,000 square feet for the Health Services Center located in Mega Park and 400 hotel rooms.

Table LUE 2 lists the approved projects with commercial land uses. The commercial land uses include:

- Casino Facility
- Hotel Rooms
- Restaurants
- Highway Commercial
- Retail Commercial
- Neighborhood Commercial
- Office
- Health Services Center

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Table LUE 2
City of Calexico
Approved Projects with Commercial Land Uses

Project Name and Description	Casino Facility Sq. Ft.	Hotel Rooms	Restaurants Sq. Ft.	Hwy. Comm. Sq. Ft.	Retail Comm. Sq. Ft.	Nbhd. Comm. Sq. Ft.	Office Sq. Ft.	Health Services Center Sq. Ft.
Calexico Gran Plaza 62 acres				561,650				
111 Calexico Place 232 acres	93,880	400	131,500		389,000		735,000	
La Jolla Palms 23.36 acres						254,390		
Palazzo 166 acres					75,000[1]		75,000[1]	
Riverview 4 Lots 4.2 acres				45,738				
Venezia Approved 12.67 acres						137,976		
Mega Park 146 acres				91,300 (9.13 acres)	484,567[2] (48.42 acres)			166,000
Calexico Gran Plaza Phase 2 Power Center 100 acres				1,069,400				
Other Sites				149,736[3]		273,663[4]		
Total	93,880	400	131,500	1,917,824	948,567	666,029	810,000	166,000

[1]The Mixed U se Village would integrate residential apartments with restaurants, cafes, retail and office developments. The commercial components could be up to 150,000 square feet. Staff report to City Council March 6, 2012.
[2]Jasper Crossing
[3]Cole Road and south of Walmart and Scaroni/Central Main Canal
[4] Two sites generally located near Cole Road/Bowker Road/Central Main Canal and nine parcels located on Cole Road between Rancho Frontera and MDR to the east

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2.2.3 Industrial Land Use

Most of the industrial land is located on either side of the railroad tracks from Jasper Road to the International Boundary. East of Highway 111 an industrial area is located in the proximity of Martin Luther King Avenue and Avenida Campillo.

Planned industrial areas include:

- Towncenter Industrial Park (48 lots)
- Mega Park (SEC 111/Jasper Road) (part of a 38.15 acre site)
- Undeveloped industrial site at Jasper Road/Central Main Canal

Business park development is planned at two locations:

- Mega Park (SEC 111/Jasper Road) (part of a 38.15 acre site)
- Cole Road/Central Main Canal/State Hwy 98 (29.18 acres)

Table LUE 3 shows the development potential of future industrial and business parks.

Table LUE 3
Industrial and Business Park Development Potential

Project/Location	Acres	Square Feet
TownCenter Industrial Park	133 (48 lots)	2,317,392
Jasper Road Central Main Canal	58.7	1,022,788
Mega Park Industrial/ Business Park	38.15	441,625
Business Park [1]	29.18	508,432
Total	259.03	4,290,237

[1] Assessor Parcel Numbers: 059-180-40, 059-180-41, 059-180-42 and 059-180-43

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2.2.4 Calexico International Airport

The Land Use Element accounts for the *Airport Land Use Compatibility Plan* ("LUCP") prepared by the County of Imperial and the County's Airport Land Use Commission, 1996. The LUCP identifies compatibility zones around the airport and suggest appropriate residential densities and criteria for other uses that will reduce conflicts between airport operations and adjacent users, and increase safety for those uses in proximity of the airport.

Exhibit LUE 2 shows the compatibility zones from the LUCP. Table LUE 4 provides a description of each zone. "Hazards to flight," which is mentioned in Table LUE 4 refers to 1) obstructions to the airspace required for flight to, from and around an airport and 2) other forms of interference with safe flight, navigation, or communication.

Exhibit LUE 2
Compatibility Zones

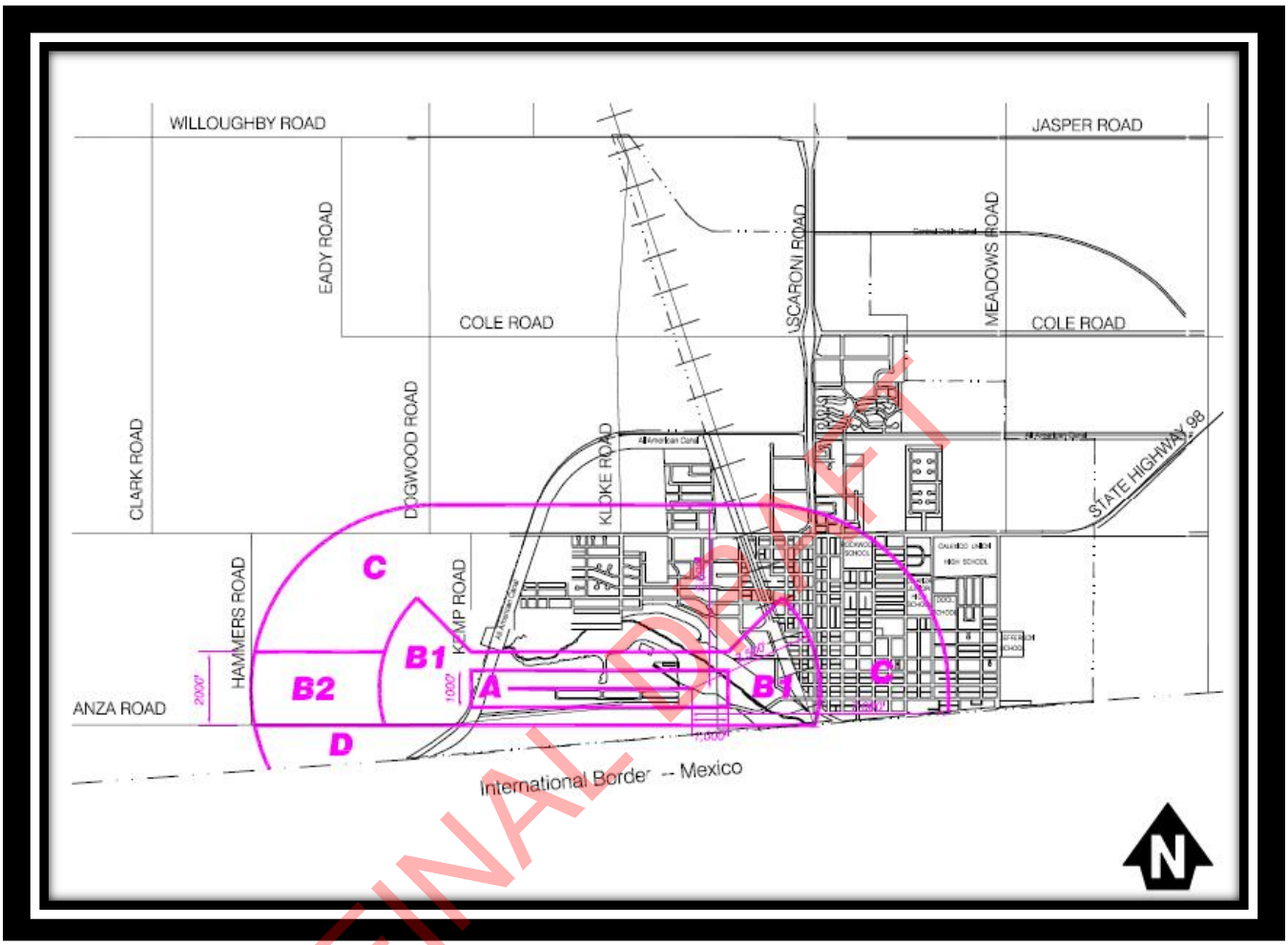

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Table LUE 4
Airport Land Use Compatibility Criteria

Zone	Risk	Maximum Densities		Required Open Land	Prohibited Uses	Other Development Conditions	Normally Acceptable Uses	Uses Not Normally Acceptable
		Residential Densities Du/Ac.	Other Uses People/ Ac.					
A	High	0	10	All Remaining	All structures except ones with location set by aeronautical function Assemblies of people Objects exceeding FAR Par 77 height limits Hazards to flight	Dedication of navigation easement	Aircraft tiedown apron Pastures, fields crops, nine yards Automobile parking	Heavy poles, signs, large trees, etc.
B1	Substantial	0.1	100	30%	Schools, day care centers, libraries Hospitals, nursing homes Highly noise-sensitive uses Above-ground storage Storage of highly flammable materials Hazards to flight	Locate structures maximum distance from extended runway centerline Minimum Noise Level Reduction of 25dBA in residential and office buildings Dedication of navigation easement	Uses in Zone A Any agricultural use except ones attracting bird flocks Warehousing, truck terminals Single-story offices	Residential subdivisions Intensive retail uses Intensive manufacturing or food processing uses Multiple-story offices Hotels and motels
B2	Significant	1	100	30%	Same as B1	Same as B1	Same as B1	Same as B1
C	Limited	6	200	15%	Schools Hospitals, nursing homes Hazards to flight	Dedication of overflight easement for residential uses	Uses in Zone B Parks, playgrounds Low-intensity retail, offices, etc. Low-intensity manufacturing, food processing Two-story motels	Large shopping malls Theaters, auditoriums Large sports stadiums Hi-rise office buildings

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2.3 GROWTH FORECASTS

Table LUE 5 shows the population, household, and employment growth forecasts for Calexico through 2035. These forecasts are from the Southern California Association of Governments' (SCAG's) *2012 Regional Transportation Plan/Sustainable Communities Strategy* (RTP/SCS). As indicated, Calexico is forecasted to gain almost 21,800 residents and approximately 8,500 households from 2015 to 2035. The SCAG forecast indicate that Calexico will have the largest population of all Imperial County cities by 2020 or soon thereafter.

Jobs in the City are forecasted to increase to 18,500 from the 2015 jobs estimate of 12,300.

Table LUE 5
Calexico 2035 Growth Forecast

Year	Population	Households	Employment
2015	41,033	10,246	12,300
2020	50,800	14,100	15,300
2030	58,800	17,200	17,400
2035	62,800	18,800	18,500
Net increase 2015-2035	21,767	8,554	6,200

Note: The 1,000 job estimate for Gran Plaza was added to the most recent citywide estimate of 11,300 jobs.
Sources: California Department of Finance, City/County Population and Housing Estimates, 01/01/2015
Southern California Association of Governments, *2012-2035 Regional Transportation Plan/Sustainable Community Strategy*, April 2012
Table construction by Castañeda & Associates

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The land use plan outlined in this Element would more than accommodate the anticipated levels of growth in the City through 2035. Build out of the residential land yields approximately 7,000 housing units, a number below the SCAG forecast. However, growth within Calexico would to need accelerate to pre-Great Recession rates to reach SCAG's growth forecast. During the next few years, housing growth can be monitored to detect changes in growth rates. This can be accomplished through the Housing Element Annual Progress Report. Additionally, SCAG will have an updated growth forecast by mid-year 2016.

2.4 GENERAL PLAN AMENDMENTS (GPAs)

Since the *2007 Land Use Element* was adopted the City has approved seven General Plan Amendments. The seven GPAs include:

- 111 Calexico Place Specific Plan
- Mega Park
- Palazzo Subdivision
- North side of Cole Blvd/west of W. Van De Graff Ave to the railroad tracks
- Estrada– Scaroni Frontage Road and Robinson Avenue
- Calexico Gran Plaza Phase 1
- Calexico Gran Plaza Phase 2 Power Center

Table LUE 6 describes and compares the 2007 land use designations and the General Plan Amendments for the seven areas.

Two GPAs eliminated the *2007 Land Use Element* residential designations, one changed the mix of residential types and densities, and a third changed an area from Commercial Highway to High Density Residential. The cumulative effect of the General Plan Amendments is to reduce the housing unit potential by approximately 1,250 housing units. Nevertheless, Calexico has sufficient residential land to accommodate the City's share of the regional housing need to the year 2021, which is 3,224 housing units. The City's share will be updated in 2021; however, the City has a total build out housing capacity of 6,857 housing units or a net of 3,663 housing units to accommodate a post-2021 regional share need allocation.

Five GPAs increased and two GPAs decreased the number of potential jobs. The *2007 Land Use Element* projected approximately 5,000 jobs in the seven areas. The General Amendments increased the jobs potential to almost 8,800 jobs. Thus, the GPAs resulted in a net increase of an estimated 3,800 jobs. Most of the jobs increase is due the Gran Plaza Phase 1 and the Gran Plaza Phase 2 Power Center.

For land located within the City limits the 2015 Land Use Element Map is the same as 2007 Map with the following exceptions:

- The 2015 Land Use Element Map incorporates the designations of the approved General Plan Amendments.
- The 2007 Commercial Office land use category has been deleted. Only two small areas were designated Commercial Office by the 2007 Land Use Element. The designations of these two areas are changed to Commercial Highway as this category allows office land uses.

For land located within the Sphere of Influence, the 2015 Land Use Element Map:

- Retains the area designated as ISP Industrial Specific Plan
- Deletes the Medium Density Residential designation for land located east of Highway 111 and between Jasper Road and Heber Road
- Designates the entire area east of Highway 111 and between Jasper Road and Heber Road as Commercial Highway
- Retains the Open Space with Airport Overlay land use category
- Designates all other land within the Sphere of Influence RSP Residential Specific Plan, which requires approval of a specific plan prior to annexation

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Table LUE 6
Land Use Comparisons Between Adopted 2007 General Plan and General Plan Amendments/Approved Projects

Location	2007 General Plan Designations	General Plan Amendments Or Approved Projects
SWC Highway 111 and Jasper Road 232 acres	• CH Commercial Highway 65.6 acres 714,384 SF • I Industrial 58.7 acres 1,022,788 SF • MDR Medium Density Residential 101.9 acres 696 housing units • HDR High Density Residential 5.8 acres 128 housing units	*111 Calexico Place Specific Plan* • Commercial Highway Casino 93,880 SF 400 hotel rooms Restaurants 131,500 SF Retail Commercial 389,000 Office 735,000 SF Fire/Police Station 20,800 SF
SEC Highway 111/Jasper Road	• CH Commercial Highway 28.0 acres 304,920 SF • MDR Medium Density Residential 126.8 acres 913 housing units	*Mega Park* • Commercial Highway 48.42 acres (Jasper Crossing) 484,567 SF of commercial uses • Other Commercial Highway 9.13 acres 91,300 SF of commercial uses • Health Services Center 12.80 acres 166,000 SF • Industrial and Business Park 38.15 acres 441,625 SF of industrial uses • Dedications and Reservations 39.90 acres Stormwater detention basins, IID substation, roads and Dogwood Canal
Jasper Road east of Mega Park	• MDR Medium Density Residential 85 acres x 7.2 DUs/AC = 612 housing units • HDR High Density Residential 45 acres x 20 DUs/AC 900 housing units Total 1,512 housing units PF Public Facility 35 acres	• *Palazzo Subdivision* 37.47 acres 276 single family housing units 53.00 acres 931 multi-family housing units Mixed Use 7.08 acres Retail Commercial 75,000 SF Office Commercial 75,000 SF Parks 19.31 acres Detention basin 13.14 acres
Corner of Scaroni Frontage Road and Robinson Avenue	• CH Commercial Highway 33.09 acres 10,890 SF/AC X 33.09 acres = 360,350 SF	• *Estrada GPA* HDR High Density Residential 33.09 acres 794 housing units
North Side of Cole Blvd. and west of W. Van De Graaff Blvd. extending to the railroad tracks	• CH Commercial Highway 100 acres 10,890 SF/AC x 100 acres = 1,089,000 SF	• Industrial 100 acres 17,424 SF/AC = 1,742,400 SF

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Table LUE 6 continued
Land Use Comparisons Between Adopted 2007 General Plan and General Plan Amendments/Approved Projects

Location	2007 General Plan Designations	General Plan Amendments Or Approved Projects
West 2nd Street Calexico International Airport U.S.-Mexico Border	• I Industrial 62 acres 17,424 SF/AC X 62.0 acres = 1,081,023 SF	• *Calexico Gran Plaza Phase 1 GPA* CH Commercial Highway 62 acres 561,650 SF of commercial retail
Calexico International Airport U.S.-Mexico Border, Gran Plaza Center and All American Canal	• I Industrial 100 acres 17,424 SF/AC X 100 acres = 1,742,400 SF	• *Calexico Gran Plaza Phase 2 Power Center GPA* CH Commercial Highway 100 acres 1,069,400 SF of commercial retail

Sources: 2007 General Plan Land Use Element, adopted May 1, 2007
111 Calexico Place Specific Plan Final EIR, December 2008
Calexico Mega Park EIR, December 2014
City Council approval of Palazzo Subdivision, March 6, 2012
City Council Agenda Report, General Plan Amendment No. 2010-02 and Zone Change No. 2010-03 (Raul & Alice Estrada), October 19, 2010
City Council Agenda Report, Zone Change No. 2009-01, C-H Commercial Highway to Ind General Industrial, north side of Cole Blvd. and west of W. Van De Graff Blvd. extending to the railroad tracks, May 20, 2009
Gran Plaza Phase 1, *Draft Environmental Impact Report*, September 2010, page 4-2
Gran Plaza Phase 2 Power Center, *Final Environmental Impact Report*, June 8, 2015, Section 4, page 206

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2.5 LAND USE ELEMENT CATEGORIES

Table LUE 7 describes the land use categories which the Land Use Map (Exhibit LUE-3) delineates.

- AP Airport
- BP Business park
- CC Commercial Core
- CN Neighborhood Commercial
- CH Commercial Highway
- LDR Low Density Residential
- MDR Medium Density Residential
- HDR High Density Residential
- I Industrial
- ISP Industrial Specific Plan
- OS Open Space
- OS Open Space w/Airport Overlay
- PF Public Facility
- RSP Residential Specific Plan

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Table LUE 7
Land Use Categories

Land Use Category	Description
Residential	
LDR Low Density Residential	The LDR category designates land for detached single family housing units on minimum lot sizes of 6,000 square feet. The maximum density is six dwelling units per net acre. The corresponding zoning district is R-1 Residential Single Family Zone.
MDR Medium Density Residential	The MDR category designates land for patio homes, duplexes, townhomes and mobilehomes. The corresponding zoning districts include R-2 and MHP Mobile Home Park Zone. The R-2 Zone permits a residential density in the range of 5.1 to 12 dwelling units per net acre. The MHP Zone permits a maximum density of seven dwelling units per net acre.
HDR High Density Residential	The HDR category designates land for multi-family housing including, but not limited to, condominiums, apartments, duplexes, and other multiple unit residential buildings. The corresponding zoning districts include RC Residential Condominium Zone and the RA Residential Apartment Zone. The RC Zone permits a residential density of 12 to 20 dwelling units per net acre. The RA Zone permits the development of residential apartments at a density of 20 to 30 dwelling units per net acre.
Commercial	
CN Commercial Neighborhood	The CN category designates land for neighborhood shopping centers which provide grocery, drug store and neighborhood related shopping. The corresponding zoning district is the CN Commercial Neighborhood Zone.
CH Commercial Highway	The CH category designates land for the location of highway oriented retail, wholesale and office uses. The CH category accommodates land uses such as major shopping centers, professional and administrative offices, hospitals, theaters, health clubs, hotels, motels, restaurants, auto dealers, gas stations, and service establishments. The corresponding zoning district is CH Commercial Highway Zone.
CC Community Core Commercial	The CC category is assigned to Calexico Downtown. The CC category accommodates a range of commercial and office uses. Mixed uses are permitted in Calexico Downtown. Residential uses are permitted on the upper floors above retail, commercial or office uses on the lower floors or freestanding on the same site. Civic uses, transit services, schools, postal services, banks, and theaters are permitted by the CC category. The corresponding zoning district is CS Commercial Specialty Zone.

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Table LUE-7
Land Use Categories

Land Use Category	Description
BP **Business Park**	The BP category promotes campus style industrial and business parks. Commercial and restaurant uses shall be allowed to support the needs of the businesses and employees. The BP category is identified for areas located along Highway 98 in the eastern part of the City to respond to opportunities presented by the Eastern Port of Entry to provide job-creating uses. Land within the Mega Park development also has been designated BP.
I **Industrial**	The I category designates land for industrial uses located primarily in the western portion of the City near the railroad tracks. The corresponding zoning districts are I General Industrial Zone and IR Industrial Rail Served Zone.
ISP **Industrial Specific Plan**	The ISP category designates land in the Sphere of Influence adjacent to the railroad tracks as Industrial Specific Plan. An Industrial Specific Plan is intended to create an industrial development that exceeds current City property development standards.
PF **Public Facility**	This category serves as a prefix for a variety of public land use areas. It is used to recognize land uses such as the City Hall, library, schools, parks, police and fire stations, and other publicly-owned facilities.
AP **Airport**	Designates the site of the Calexico International Airport.
OS **Open Space**	The Open Space designation delineates areas that shall remain protected as open space but are not accessible to the public for recreational purposes. An example of this designation is used for such areas as publicly-owned land along the New River where currently public access is prohibited due to the contamination of the river. In the future, should the river area be cleaned up such that human activity is allowed, this area could be considered for redesignation to PF. The OS also includes large ponds or retention areas not open to the public, irrigation and drainage canals, or natural areas that may warrant preservation. The corresponding zoning district is OS Open Space Zone.
OS with **Airport Expansion Overlay**	This designation is applied to the lands located west of the Calexico International Airport within the Sphere of Influence. The designation allows for expansion of the airport as envisioned in the Airport Master Plan, as well as open space and agricultural uses that are compatible with airport operations. Once the airport expansion is completed and the area annexed into the City, this area could be planned and developed for other uses that are compatible with expanded airport operations such as industrial.

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RSP **Residential Specific Plan**	The RSP is a designation applied to land not yet annexed into the City limits. Prior to annexation, a Specific Plan must be approved by the City for an area designated RSP. The Specific Plan must demonstrate a range of residential uses and a mix of well designed land uses that support a residential community, such as a variety of housing densities, residential products, retail, civic, schools, parks, and other uses. City and school district requirements for parks and schools must be met within each Specific Plan or group of plans in the same area as population warrants. The Specific Plan also must include measures to preserve agricultural lands to the maximum degree possible.

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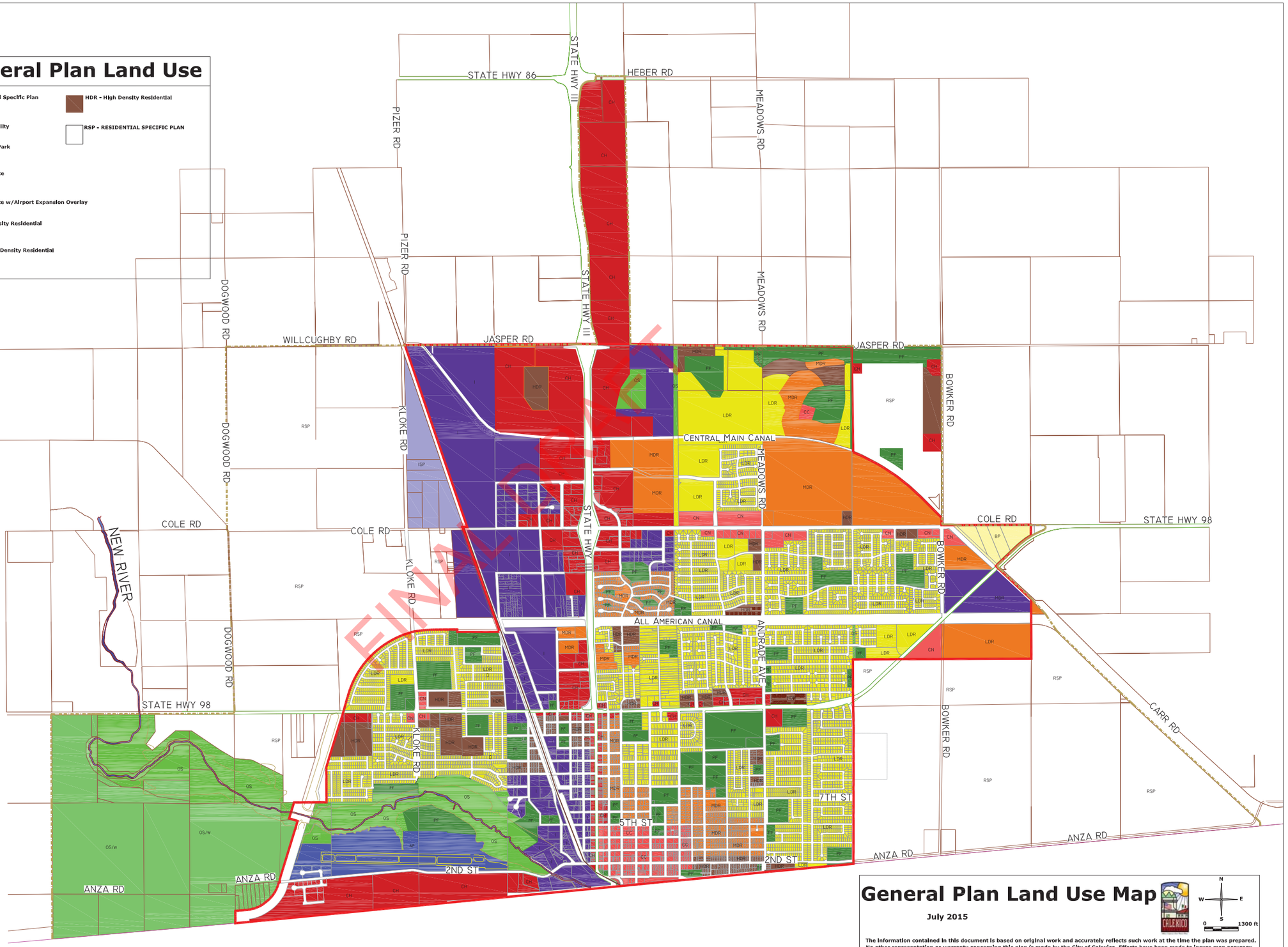
City of Calexico - General Plan Land Use

- CLX_City_Limits Areas
- CLX_Sphere_of_Influence Areas
- CNTY_Railroad Areas
- AP - Airport
- CH - Commercial Highway
- CN - Commercial Neighborhood
- CC - Commercial Core Mixed Use
- I - Industrial
- ISP - Industrial Specific Plan
- PF - Public Facility
- BP - Business Park
- OS - Open Space
- OS - Open Space w/Airport Expansion Overlay
- LDR - Low Density Residential
- MDR - Medium Density Residential
- HDR - High Density Residential
- RSP - RESIDENTIAL SPECIFIC PLAN



General Plan Land Use Map

July 2015

N W E S

0 1300 ft

The information contained in this document is based on original work and accurately reflects such work at the time the plan was prepared. No other representation or warranty concerning this plan is made by the City of Calexico. Efforts have been made to insure map accuracy. However, this map may be revised at any time without notice. Any discrepancies should be brought to the attention of the Development Services Department.

2.7 RELATIONSHIP OF GENERAL PLAN LAND USES TO ZONING

The City's Zoning Ordinance and designated zone districts are a tool used to implement the General Plan Land Use Plan. The purpose of zoning is to promote and protect public health, safety, and welfare, and to safeguard and enhance the appearance and quality of development within the City of Calexico. State law requires that the zoning on any parcel must be consistent with the parcel's General Plan Land Use designation. If they are not consistent, prior to development approval, a zone change is required to create consistency. The land use category descriptions include the identification of the corresponding and consistent zoning districts.

2.8 GOALS, OBJECTIVES, POLICIES, AND IMPLEMENTATION MEASURES

Goals, objectives and policies are established for the following:

- General Land Use
- Residential Land Use
- Commercial and Industrial Land Use
- Downtown Calexico
- Airport Land Use
- Land Use and Circulation
- Infill Development
- Community Appearance

Part 2.8.8 describes the Implementation Measures.

2.8.1 General Land Use

Goal: Promote land development that conserves precious resources including air quality; water and energy; encourages a healthy lifestyle; and enhances alternative to modes of transportation.

Objective: Ensure that individual residential and non-residential projects incorporate sound land development practices.

Policies:

- Promote land development practices that reduce energy and water consumption, air and water pollution, greenhouse gas emissions, and waste, incorporating practices such as:

  - ✓ Concentration of uses and design of development to promote active transportation (walking and biking) and use of public transit instead of the automobile.
  - ✓ Orientation of buildings to maximize opportunities for solar energy use, daylighting, and ventilation
  - ✓ Use of permeable paving materials
  - ✓ Shading of surface parking and walkways

- Develop land uses that enhance the existing transportation network, minimize the impacts of vehicles in the City, and encourage the use of alternative modes of transportation.

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- Require that new development include pedestrian access to enhance the community's pedestrian character and pedestrian linkages between the major shopping and employment centers, residential neighborhoods and open spaces.

2.8.2 Residential Land Use

Goal: Provide an adequate mix of low, medium and high density residential land uses to house seniors and families of all economic segments.

Objective: Ensure sufficient residential sites to accommodate Calexico's share of the regional housing need for all income groups.

Policies:

- Facilitate the development of approved residential projects.
- Encourage infill development on vacant and underutilized sites.
- Incorporate in the Zoning Ordinance incentives for mixed use development.
- Facilitate residential development in close proximity to jobs and services.
- Promote an improved jobs/housing balance by annually monitoring job growth and housing development.

2.8.3 Commercial and Industrial Land Use

Goal: Achieve commercial and industrial development that capitalizes on Calexico's border location and provides diverse jobs and sales tax revenues to fund high levels of City services.

Objectives:

- Increase the number and diversity of jobs.
- Increase sales tax revenues.

Policies:

- Promote commercial development that meet the needs of City residents and attracts shoppers from Mexicali and other Imperial County communities.
- Facilitate the development of approved commercial and industrial projects.
- Promote industrial and business park developments that provide a variety of jobs.
- Ensure the compatibility of commercial and industrial land uses with adjacent land uses.
- Neighborhood commercial centers should be designed in such a manner so as to compliment and not conflict with adjoining residential areas.
- Specialty commercial uses such as swap meet sites, although typically transient in nature, should provide standard amenities such as paved parking lots, restroom facilities, shade structures, and food vendors if allowed to operate for longer than one week.
- Retail uses within the highway commercial zone should be located within retail centers having centralized ingress and egress points and/or frontage road access in order to minimize curb cuts along Highway 111 and Highway 98.
- Prepare a Business Park Zone.

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2.8.4 Downtown Calexico

Goal: Create a vibrant, exciting, and prosperous Downtown Calexico.

Objective: Restore commercial prosperity to the Downtown Calexico.

Policies:

- Create a vibrant environment that provides for the shopping, eating and entertainment needs of the community.
- Integrate parks and plazas into the fabric of the Downtown. Because downtown enjoys high foot traffic, provide pedestrians new and improved places to gather, places to play, and places to sit a while.
- Enhance transportation options. Create easy opportunities for bus, taxi, walking and automobile travel and create seamless connections between them.
- Improve circulation of traffic into Downtown. Provide signage and easy turns into downtown from Imperial and new border crossing alignment.
- Integrate housing into and around the Downtown Core. Add residents Downtown to keep it bustling during the day and evening.
- Establish incentives for mixed-use development to be developed in Downtown Calexico.

Exhibit LUE 4 shows the boundaries of Calexico Downtown.

2.8.5 Airport Land Use

Goal: Ensure the compatibility of land uses surrounding the Calexico International Airport.

Objective: The City will work to encourage and attract compatible users and uses in and around the airport to promote airport safety and consider potential airport related noise.

Policies:

- In the event of a substantial number of complaints regarding increases in noise levels, the City will evaluate feasible noise abatement procedures.
- Significant changes in land use in and around the Airport (within 2 miles) shall be referred to the Imperial County Airport Land Use Commission for their comment and consideration.

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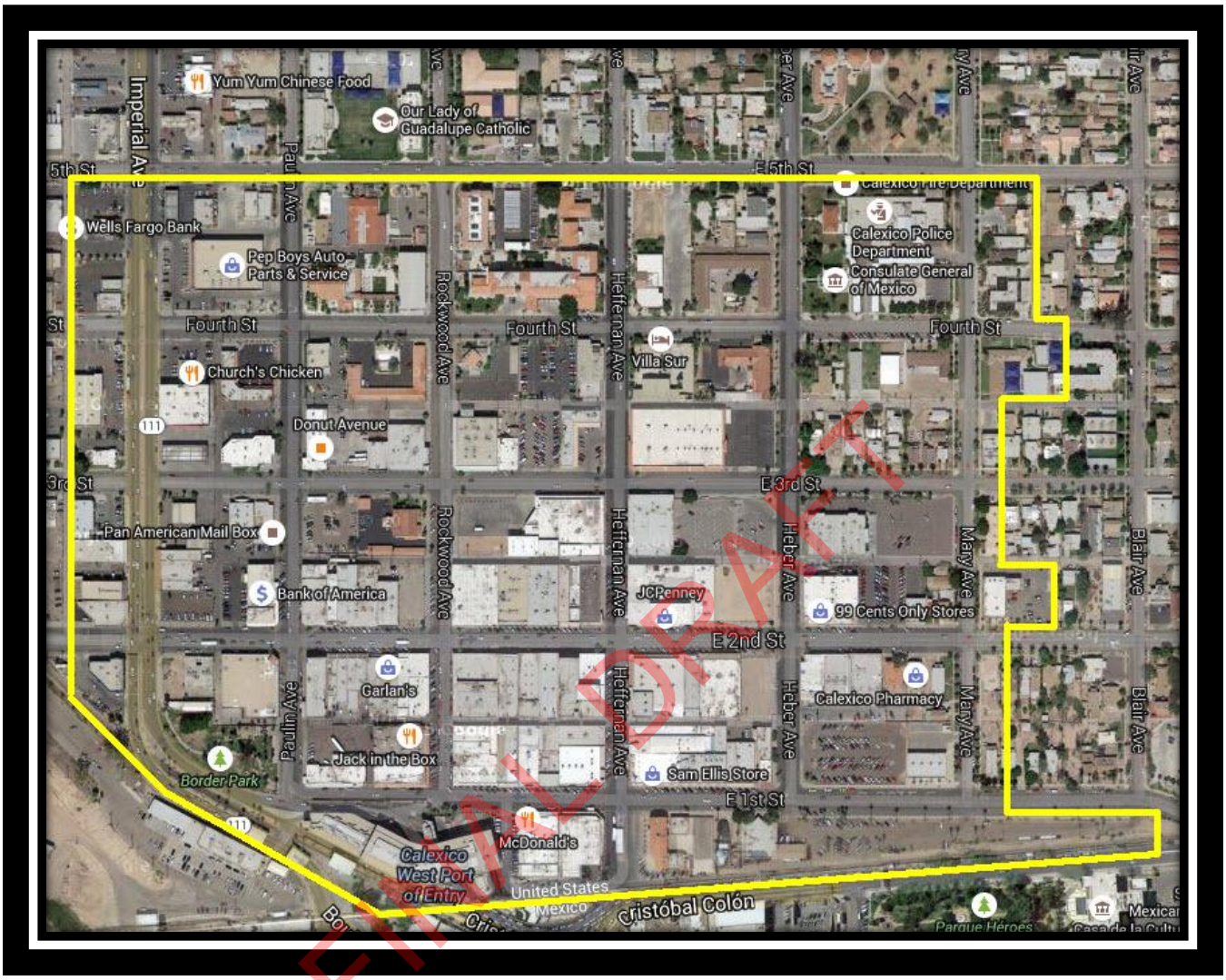
Exhibit LUE 4
Downtown Calexico



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2.8.6 Infill Development

Goal: Achieve the development of infill sites with well designed developments including mixed use developments.

Objective: The City shall encourage infill and adjacent new development to provide for the efficient use of existing infrastructure, avoid "leap frog" new development and to reduce impacts to agriculture.

Policies:

- The extension of water and sewer service facilities should be limited to one-quarter mile across an undeveloped area.
- Develop a Mixed Use Overlay Zone that can be applied at the request of property owners on potential infill sites.
- Develop incentives for the development of infill sites such as density bonuses, waiver, deferral or reduction of City fees, and expedited development processing

Exhibit LUE 5 shows the location of several potential infill development sites.

Table LUE 8 lists already developed and potential infill housing sites. Site A is an infill site that was developed as an affordable family rental housing development. One infill site was recently developed in Calexico Downtown as an affordable, single room occupancy complex for senior citizens.

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Exhibit LUE 5
Potential Infill Sites

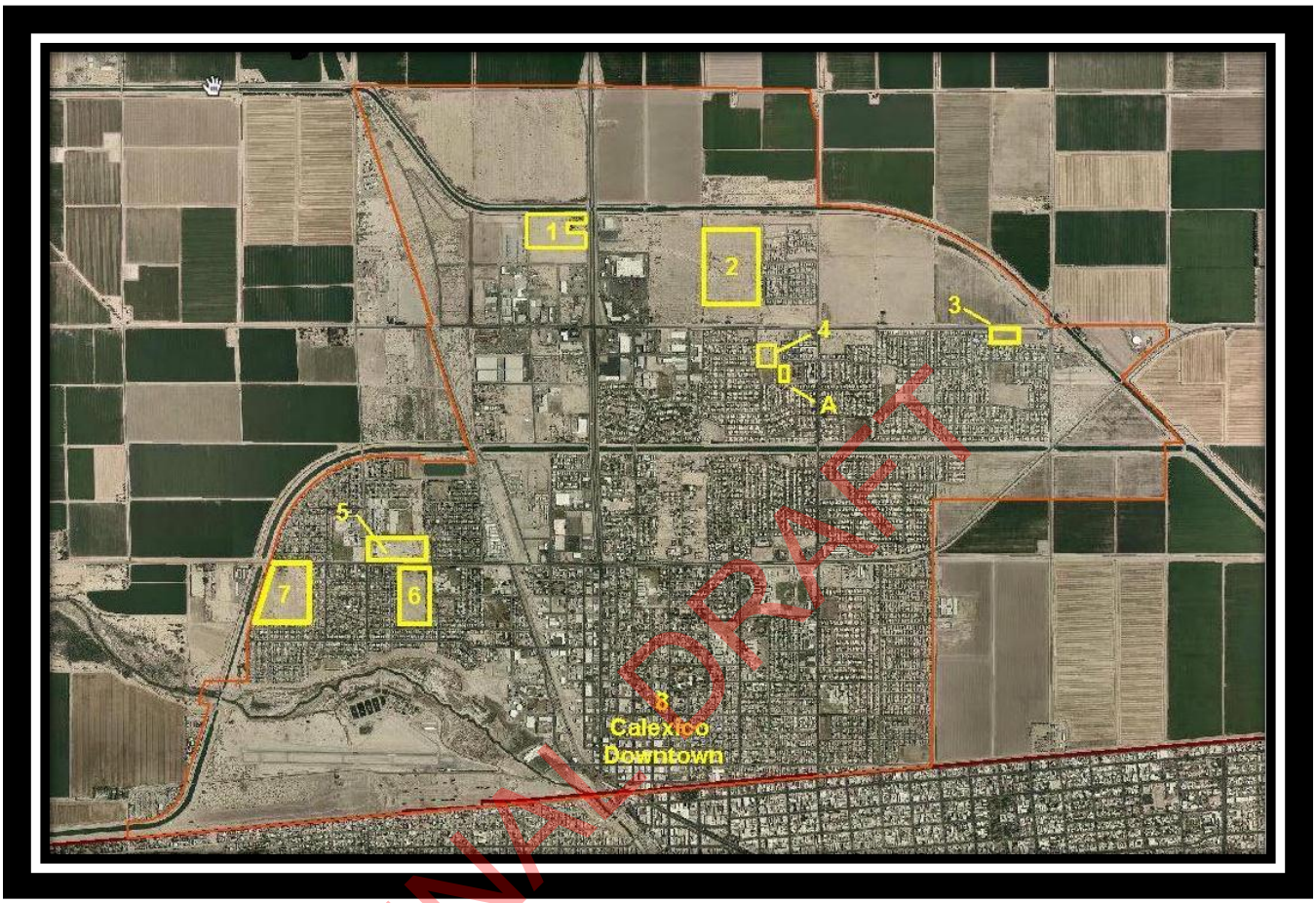

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Table LUE 8
City of Calexico
Infill Housing Sites

Site Number	Site Name/ Assessor Parcel Numbers	Land Use Designation[1]	Zoning Designation[2]	Acres	Housing Capacity
A	Villa Primavera 058-832-040	HDR	RA	2.86	48
1	Estrada HDR 059-010-019[3] 059-010-020	HDR	RA	33.09	794
2	Pacific Century Homes 059-491-003 059-500-002	LDR	R1	40.00	250
3	059-450-003[4] 059-450-004[4]	HDR	RA	4.30	103
4	058-832-016	LDR	RA	5.00	120
5	058-853-001 058-853-002	HDR	RA	9.85	236
6	Remington Condominiums 058-180-050 058-180-064	HDR LDR	RA R1	20.00	272
7	Riverview Condominiums 058-180-008 058-180-009 058-180-010 058-180-011	HDR	RC	25.00	352
8	Downtown Calexico Various Parcels	CC	CS	--	--
Total				137.24	2,127

[1]HDR refers to High Density Residential; LDR refers to Low Density Residential; MDR refers to Medium Density Residential; CC refers to Commercial Core
[2]RA refers Residential Apartment Zone; R1 refers to Residential Single Family Zone; RC refers to Residential Condominium Zone; CS refers to Commercial Specialty Zone.
[3]059-010-019 = 19.78 acres; 059-010-020 = 13.31 acres
[4]059-450-003 = 3.29 acres; 059-450-004 = 1.01 acres
Table construction by Castañeda & Associates

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2.8.7 Community Appearance

Goals: Improve the community's appearance.

Objective: Eliminate physical features such as poor signage, poorly maintained lots and dilapidated housing which detract from Calexico's appearance.

Policies

- Improve the visual appearance of Calexico by identifying areas in need of beautification and rehabilitation.
- Promote and encourage the overall improvement in visual appearance for commercial and industrial areas.
- Encourage the maintenance and improvement of older residential neighborhoods to prevent decay, blight and decline in property values.

2.8.8 Implementation Measures

2.8.8.1 Zoning Ordinance Update

The Zoning Ordinance is outdated and should embody more modern thinking regarding smart growth and good design which will lead to quality development. In some ways, the Zoning Ordinance could be considered an impediment to quality land use and economic development. Although the entire Zoning Ordinance should be updated, the immediate focus should be on the following:

- Remove impediments to mixed use development by creating a Downtown Mixed Use Zone and a Mixed Use Overlay Zone that could be applied to other sites located in Calexico.
- Encourage Business Park development by creating a Zone District that implements the purpose and intent of the Land Use Element BP category.
- Work with representatives of approved developments to identify the Zoning Ordinance changes that should be made for purposes of facilitating development, encouraging good design, and creating opportunities for entrepreneurs.

2.8.8.2 General Plan Annual Progress Report

Government Code Section 65400 mandates that certain cities and all 58 counties submit an annual report on the status of the General Plan and progress in its implementation to their legislative bodies, the Governor's Office of Planning and Research (OPR) and the Department of Housing and Community Development (HCD) by April 1 of each year. Only charter cities are exempt from the requirement to prepare Annual Progress Reports (APRs) unless the charter stipulates otherwise (Government Code Section 65700).

The purpose of the report is to inform the Planning Commission and City Council of the progress made toward implementation of the General Plan Elements. Among the topics discussed in the General Plan Progress Report are:

- Priorities for land use decision making that have been established by the Planning Commission and City Council.

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- Goals, policies, objectives, standards or other plan proposals that need to be added or were deleted, amended, or otherwise adjusted.
- Planning activities initiated – These may include, but are limited, to master plans, specific plans, master environmental assessments, annexation studies, and other studies or plans.
- General Plan Amendments – These include city-driven as well as applicant driven amendments.
- Major development applications processed.

The City should annually prepare a General Plan Progress Report.

2.8.8.3 Housing Element Annual Progress Report

Government Code Section 65400 requires each city and county to prepare an annual report on the status and progress in implementing the jurisdiction's housing element. The City Council adopted the *2013-2021 Housing Element* in January 2014. The APR is an important tool tracking and monitoring progress in addressing housing needs and goals. The APR includes information on a city's progress in addressing the regional housing need allocation, including the number of housing units permitted by income level, the status of program implementation and efforts to remove governmental constraints.

Providing housing to meet the housing needs of all economic segments of the community contributes to meeting the overarching goals of the *Land Use Element* and *Economic Development Element* as well as the adopted *Housing Element*. The City should annually prepare a Housing Element Progress Report in order to keep the Planning Commission and City Council well-informed.

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Appendix G: Specific Plans – 2015 County Land Use Element

City of Calexico 2015 Urban Water Management Plan

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D. Specific Plans

1. Purpose and Content

Specific Plans are "planning tools" used to implement the general plan for large development projects such as a planned residential community, large scale commercial project, industrial park, etc., or to designate an area of the County where further studies are needed prior to development. Specific Plans should be utilized where existing conventional zoning regulations do not provide adequate controls over land use and development. Upon adoption, the Specific Plan serves as an amendment to the County General Plan for a very defined and detailed area. To be adequate, a Specific Plan must also be consistent with all aspects of the General Plan.

Specific Plans may be adopted by Resolution of the County Board of Supervisors. Following adoption of the Specific Plan, all subsequent use or development of the property shall be in conformance with the Specific Plan. The minimum required contents of Specific Plans are set forth in the California Government Code, Section 65451, as follows:

(a) A text and/or diagrams which specify all of the following in detail:

(1) The distribution, location, and extent of the uses of land, including open space, within the area covered by the plan.

(2) The proposed distribution, location, and extent and intensity of major components of public and private transportation, sewage, water, drainage, solid waste disposal, energy, and other essential facilities proposed to be located within the area covered by the plan and needed to support the land uses described in the plan.

(3) Standards and criteria by which development will proceed, and standards for the conservation, development, and utilization of natural resources, where applicable.

(4) A program of implementation measures including regulations, programs, public works projects, and financing measures necessary to carry out paragraphs (1), (2), and (3).

(b) The Specific Plan shall include a statement of the relationship of the Specific Plan to the County General Plan.

<u>The determination on whether a specific plan shall be prepared rests entirely with the Planning & Development Services Department.</u>

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2. Standards and Criteria for Approval

Specific Plans often represent significant investment of staff time to process the project, as well as County and local agency resources to support planned new growth. In order to justify this commitment of resources, proposed Specific Plans shall be required to clearly demonstrate fiscal, economic, social, public facility, or other local public benefit. The following Standards and Criteria shall be evaluated for each proposed Specific Plan during a "Specific Plan Pre-Application Assessment" with recommended findings presented to the Board of Supervisors by the Planning & Development Services Department and Planning Commission. In order to adopt a Specific Plan, the Board of Supervisors shall consider the findings of the following five criteria:

(a) Will the Specific Plan have a positive fiscal and economic long term impact for the County of Imperial?

An acceptable project will be able to demonstrate through an independent fiscal impact analysis and public facility financing study that revenue from property tax, sales tax, hotel room tax, and required fees, exactions, and assessments, will fully offset the cost of providing public services and infrastructure, including County administrative facilities, libraries, parks, roads, drainage, schools, wastewater collection and treatment, water treatment and distribution, fire protection, and police services.

(b) Will the Specific Plan create new and permanent jobs?

An acceptable project will be able to demonstrate through an independent market analysis that jobs to be created by the project will not be achieved to the detriment of existing jobs or businesses within the County. In other words, there will be a net increase in County-wide employment.

(c) Will the Specific Plan minimize or mitigate adverse environmental impacts and be compatible with existing or planned land uses of nearby cities or communities?

An acceptable project will be able to demonstrate feasible mitigation for all potential environmental and land use impacts of the project.

(d) Will the Specific Plan offer diverse or unique opportunities to the County and its citizens?

An acceptable project will be able to demonstrate benefits of the project which are not generally or adequately available in the County. Examples include, but are not limited to, increased cultural activities, convention or conference facilities, or unique recreational opportunities.

(e) Will the Specific Plan result in the achievement or significant progress toward accomplishing an unmet goal of the County General Plan?

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An acceptable project will be able to demonstrate that the achievement of a goal of the County General Plan or one of its Elements, which is not currently being adequately met, will be substantially advanced as a result of the proposed project.

In addition to the above findings, if the proposed Specific Plan is less than 640 acres in size, a finding shall also be made that the proposed project will provide a significant social or economic benefit to the County.

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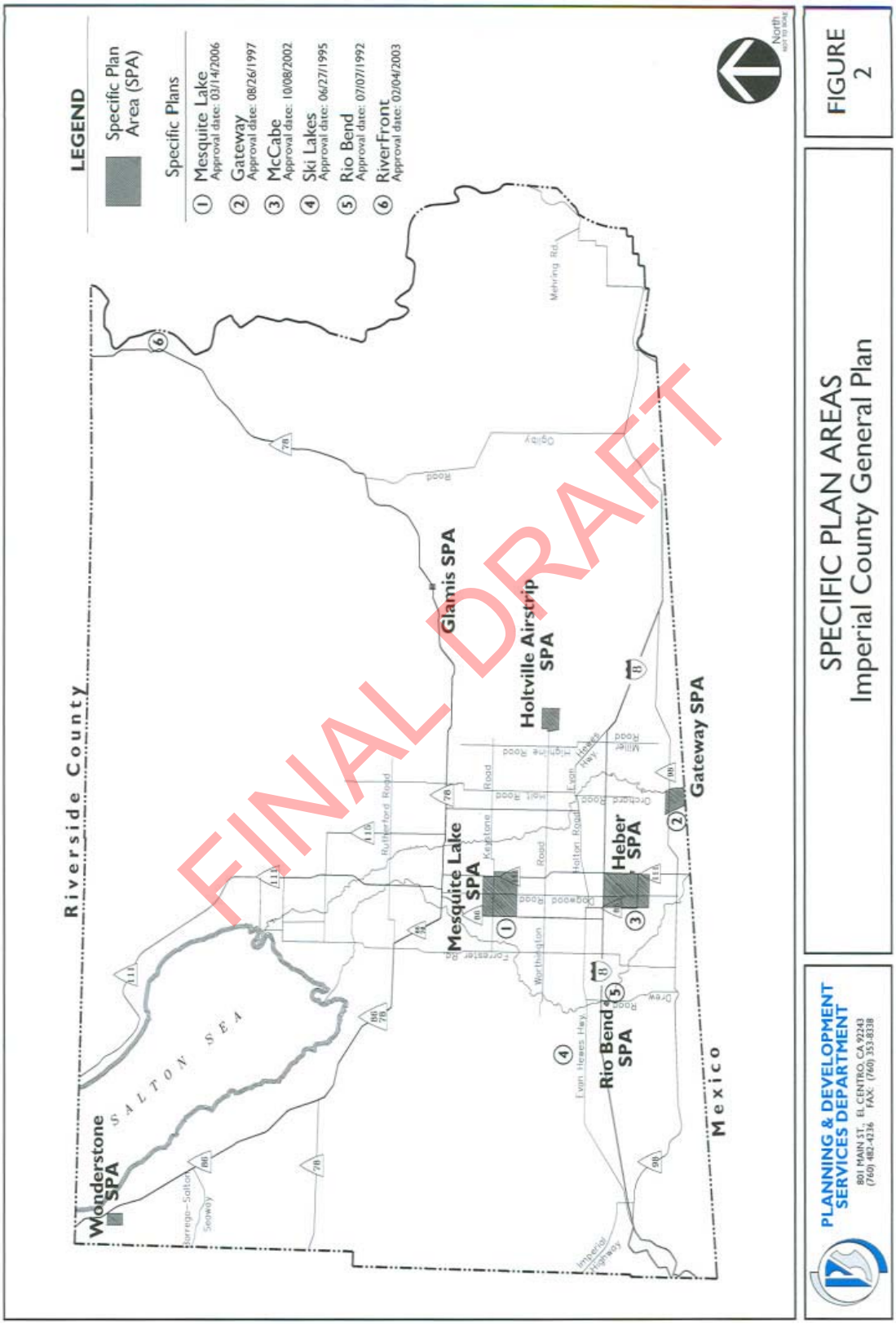
Figure 2 – Specific Plan Areas



3. Designated Specific Plan Areas

The following Specific Plan Areas (SPAs) are shown on Figure 2 and designated on the Land Use Plan of the County General Plan. In these areas, except for the Mesquite Lake SPA, a Specific Plan, approved by the Imperial County Board of Supervisors, is required prior to any significant new use or development, except agricultural use.

This Land Use Element supersedes all prior Land Use Elements. Previously approved but never developed (as of September 30, 2006) or rescinded/deleted Specific Plan Areas no longer Identified in this Element shall be deemed null in void. Plan Areas removed and deemed null in void in this update include Habitat 2000, Bombay Beach "North", and Viva del Sol (Paden/Shealy).

Previously removed Specific Plan Areas include Felicity, Tamarack Canyon Ranch, and CM Ranch by Board of Supervisors M.O. 24 dated Dec. 16, 2004.

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Gateway of the Americas (adopted August 26, 1997) Specific Plan Area

The Gateway Specific Plan Area is located adjacent to the International Boundary approximately 5 miles east of the City of Calexico. It encompasses approximately 1,700 acres bounded on the west by the Ash Canal, on the north by a line approximately 1,300 feet north of Highway 98, on the east by the Alamo River, and on the south by the Republic of Mexico.

The Specific Plan Area surrounds the new 87-acre port of entry (POE) on the U.S. side of the border which was developed by the U.S. General Services Administration (GSA). Construction of the POE has begun in 1993 and will result in the largest land crossing located along the 2,000-mile Mexico-U.S. border. The GSA expects that all commercial traffic currently using the Calexico crossing and much of the east-bound commercial traffic from the Tijuana area now using the Otay Mesa crossing in San Diego County, will be diverted to the new POE. The new State Route 7 (completed in 2005) connects the POE to Interstate 8 and State Route 98.

Objectives

The Gateway Specific Plan Area is intended to be developed primarily with industrial, office, and warehouse space for manufacturers, customs brokers, freight forwarders, and corporate or administrative offices. Secondary land uses would include retail, restaurant, and service commercial outlets, a truck service center, motel accommodations, housing, and recreation.

The Specific Plan shall be coordinated with the City of Calexico and all affected local, state, and federal agencies, and major property owners on both sides of the border.

Development of public services within the SPA shall be provided concurrent with need.

Extension of rail service to the SPA will provide additional economic benefits for the project and should be pursued.

Existing agricultural uses adjoining the SPA shall be protected from incompatible land uses and the “right to farm” shall be preserved.

Water quality, natural habitat, and visual benefits of the Alamo River shall not be adversely impacted by the proposed development.

Policies

The primary land uses of industrial, office, and warehouse space shall account for not less than 65 percent of the net developable area of the SPA. Net developable area excludes land for major roadways, other infrastructure improvements, and natural or recreational open space. The remaining 35 percent is limited to retail, restaurant, service commercial outlets, truck service center, motel accommodations, and housing.

An adequate, independent market analysis shall be required to support proposed land uses. The market analysis shall include an analysis of the need for housing, including employee housing affordable to low to moderate income households.

Development plans shall be coordinated with the U.S. General Services Administration, Border Patrol, and other appropriate federal agencies; landowners on the Mexican side of the border and appropriate agencies of the Mexicali city government and the Republic of Mexico; the City of Calexico; Imperial Irrigation District; and Caltrans and other appropriate State agencies.

The Specific Plan includes a public facilities financing plan outlining capital improvements needed for the project, feasible financing mechanisms, and timing for their construction. This includes sewer, domestic water, transportation, fire and police protection, and schools.

The Specific Plan was accompanied by an Environmental Impact Report which included an analysis of project impacts to include the following: Agriculture, air and water quality, biology, cultural resources, growth inducement, traffic, visual/aesthetics, and such other issues as required by the County of Imperial and other Responsible Agencies.

Zoning

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The Gateway of Americas Specific Plan land use zones include "GC" Gateway Commercial, "GI" Gateway Industrial, and "GSP" Government/Special Public. There is also an overlay area identified as "GCC" Gateway Central Commercial, which is characterized as areas limited to commercial/retail uses only. Uses and development standards are listed with the Gateway of Americas Specific Plan. The implementing ordinance shall be the Imperial County Codified Ordinance, Title 9 (Land Use Ordinance), Division, 5, Chapter 1, Section 90501.17, with the Specific Plan identified as an "Exhibit".

NOTICE: This plan was adopted by the Board on August 26, 1997 and is herewith incorporated into the County's General Plan as Appendix A. The above statement of intent reflects the original objectives.

Glamis Specific Plan Area

The Glamis Specific Plan Area encompasses approximately 160 acres bisected by State Highway 78 approximately 27 miles east of the City of Brawley. The Southern Pacific Railroad crosses the site on the east. Life at Glamis is centered around off-road vehicle activity at the Algodones Sand Dunes and Osborne Scenic Overlook.

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Objectives

The Glamis Specific Plan Area is intended to accommodate recreation-supporting land uses including retail and service commercial, motel accommodations, recreational vehicle and mobile home parks, and community facilities.

The Specific Plan shall be coordinated with the Bureau of Land Management (BLM) and affected local agencies.

Public services to the SPA shall be provided concurrent with need.

Policies

The Specific Plan shall focus on visitor-serving facilities and accommodations. Residential uses shall not be intended for permanent occupancy except as needed for on-site employees.

The Specific Plan shall include design guidelines for the physical arrangement of land uses and open space/recreation areas. Adequate open space shall be provided within the developed areas to complement the open space character of the area. Buildings should be sited to allow through views from Highway 78 to open space beyond.

The Specific Plan shall include a public facilities financing plan outlining capital improvements needed for the project, feasible financing

mechanisms, and timing for their construction. This includes, sewer, water, and fire and police protection.

The Specific Plan shall be accompanied by an Environmental Impact Report which includes an analysis of project impacts to include the following: Air and water quality, biology, noise, traffic, visual/aesthetics, and such other issues as required by the County of Imperial and other Responsible Agencies.

Holtville Air Strip Specific Plan Area

The Holtville Air Strip encompasses approximately 1,830 acres located 6 miles east of the City of Holtville. The East Highline Canal runs along the west boundary of the site. Road access is provided by Norrish Road and Worthington Road.

Constructed as the Auxiliary Air Station by the U.S. Navy in World War II, Holtville Airport is now owned and operated by the County of Imperial, though by deed from the federal government, it may be re-established as a military airfield in the future. It has the longest and widest runway, plus the greatest land area of any of the public use airports in the County and was selected as one of the preferred sites for a "wayport", a super-regional airport hub that would primarily serve as a place where passengers would transfer between local and long-haul flights. The airstrip is presently unattended, contains no facilities, and is seldom used; but represents an opportunity to develop job-producing land uses benefiting the City of Holtville and the region.

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Objectives

The Holtville Air Strip Specific Plan Area is intended to allow development of a regional airport and support facilities; and also to accommodate light to medium industrial uses, primarily those conducted within enclosed buildings. Community facilities and agricultural packing and processing may also be appropriate. Residential uses shall not be permitted. It is further the intent of this plan to protect the land uses around the specific plan area.

The Specific Plan shall be coordinated with the City of Holtville, Bureau of Land Management (BLM), and other affected local agencies.

Public services to the SPA shall be provided concurrent with need.

Policies

The Specific Plan shall focus on job producing manufacturing and service uses. Establishment of an airport at or adjacent to the site is not a requisite for development, but should be evaluated for feasibility throughout the process. The land use plan should be designed to accommodate a potential future decision to site a regional airport.

The Specific Plan shall include a public facilities financing plan outlining capital improvements needed for the project, feasible financing mechanisms, and timing for their construction. This includes, sewer, water, and fire and police protection.

The Specific Plan shall be accompanied by an Environmental Impact Report which includes an analysis of project impacts to include the following: Agriculture, air and water quality, biology, cultural resources, growth inducement, noise, traffic, visual/aesthetics, and such other issues as required by the County of Imperial and other Responsible Agencies.

No private projects are allowed absent a Specific Plan or a Conditional Use Permit under special conditions.

Mesquite Lake Specific (adopted March 14, 2006) Plan Area

Mesquite Lake is located between the Cities of Imperial and Brawley and is predominantly affected by soils that are high alkaline which reduces agriculture production. The proposed Specific Plan Area encompasses approximately 11.5 square miles bordered on the west by State Route 86, on the north by Carey Road, on the east by Highway 111 from Carey Road to Keystone Road and 2,500 feet east of State Route 111 from Keystone Road to Harris Road, and on the south by Harris Road. The Holly Sugar Plant, and manure cogeneration and biomass plants, exist on the site.

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Objectives

The Mesquite Lake Specific Plan Area provides the opportunity to develop new light, medium, and heavy industrial land uses. Residential uses are not permitted because they are not compatible with planned industrial uses and surrounding agricultural uses.

The Specific Plan will be coordinated with the County of Imperial, City of Imperial, and other affected local agencies.

Public services to the SPA shall be provided concurrent with need.

Policies

The Specific Plan shall focus on job-producing industrial uses. Agriculture-related uses such as packing and processing, waste processing, equipment manufacturing and maintenance, and production and distribution of farm chemicals would be permitted.

The area also contains geothermal resources which should be developed if economically feasible. Direct geothermal heat uses as well as other

appropriate renewable energy uses are also strongly encouraged in this area.

The Specific Plan shall include a public facilities financing plan outlining capital improvements needed for the project, feasible financing mechanisms, and timing for their construction. This includes, sewer, water, and fire and police protection.

The Specific Plan shall be accompanied by an Environmental Impact Report which includes an analysis of project impacts to include the following: Agriculture, air and water quality, biology, cultural resources, growth inducement, traffic, visual/aesthetics, and such other issues as required by the County of Imperial and other Responsible Agencies.

Zoning

The Mesquite Lake Specific Plan land use zones include "ML-I-1" Mesquite Lake Light Industrial, "ML-I-2" Mesquite Lake Medium Industrial "ML-I-3" Mesquite Lake Heavy Industrial, "ML-AA" Mesquite Lake Agriculture and Aquaculture, and "ML-GS" Mesquite Lake Government/Special Public. Uses and development standards are listed with the Mesquite Lake Specific Plan. The implementing ordinance shall be the Imperial County Codified Ordinance, Title 9 (Land Use Ordinance), Division, 5, Chapter 1, Section 90501.17, with the Specific Plan identified as an "Exhibit".

NOTE: This plan was adopted by the Board on March 14, 2006 and is herewith incorporated into the County's General Plan as Appendix B.

Heber Specific Plan Area

The Heber Specific Plan Area includes approximately 4,834 acres between the Jasper and Willoughby Roads on the south, the State Route 86 to the west, McCabe Road to the north, State Route 111 to the east, and a 1,320 feet strip of land east of State Route 111 running from Correll Road and Heber Road. The Heber Specific Plan Area is designed to allow for mixed use development within the Heber Public Utility District due to its ability to offer urban level services.

Objectives

The Heber Specific Plan Area is intended to allow commercial, residential, industrial, renewable energy and other employment oriented development in a mixed use orientation. It shall also include open space/recreation area with at least one 40 acre or larger regional park along McCabe Road.

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The Specific Plan will be coordinated with the City of El Centro and the Heber Public Utility District.

Public services will be provided concurrent with need.

Policies

The Specific Plan shall allow for a wide range of development opportunities which can conform in a mixed use setting.

The Specific Plan shall include architectural and landscape design guidelines which assure sensitivity to the regional corridor of Highway 111.

The Specific Plan shall include a public facilities financing plan outlining capital improvement needed for the project, feasible financing mechanisms, and timing for their construction. This includes sewer, water, and fire and police protection.

The Specific Plan shall be accompanied by an Environmental Impact Report which includes the analysis of project impacts to include the following: Agriculture, air and water quality, biology, cultural resources, growth inducement, traffic, visual/aesthetics, and such other issues as required by the County of Imperial and other Responsible Agencies.

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Wonderstone Aggregate Plan Area

The Wonderstone Aggregate Specific Plan Area encompasses approximately 721.33 acres located approximately 2 miles west of the community of Salton Sea Beach in the northwestern area of the County of Imperial. Identified as a portion of Section 16 and all of Section 21, Township 9 South, Range 9 East, S.B.B.& M. The proposed Wonderstone Aggregate Specific Plan Area is intended to provide an area for the mining and processing of aggregate; the production of aggregate products, hot mix asphalt and Portland cement concrete; and the importation, storage and processing of recycled asphalt and concrete to service ongoing local and regional development and growth.

Objectives

The Wonderstone Aggregate Specific Plan Area provides the opportunity to protect the current and future ability to mine and process the significant aggregate deposits within the Specific Plan Area through the prohibition within the Specific Plan Area of incompatible land uses.
Protect the environment by adopting uniform general planning standards which would apply to all aggregate surface mining operations, and planning and performance standards which would apply to processing and reclamation activities, the production of aggregate products, hot mix asphalt and Portland cement concrete; and the importation, storage and

processing of recycled asphalt and concrete, within the Specific Plan Area and;

Create and maintain Imperial County jobs – directly in the aggregate mining and processing, trucking, construction, and building trades, and indirectly in the general economy through the support of construction and building projects which require aggregate, hot mix asphalt and Portland cement concrete.

The Specific Plan will be coordinated with the County of Imperial, City of Imperial, and other affected local agencies.

Public services to the SPA shall be provided concurrent with need.

Policies

The Specific Plan shall focus on protecting and maintaining aggregate deposits by providing an area wide longer term development plan.

Maintain existing job-base and encourage future job growth, both direct and indirect of the aggregate operation.

The Specific Plan shall contain project specific land use zoning and development standards for the entire project site. The Specific Plan shall also include an area wide Reclamation Plan outlining remeadation of the site after development.

The Specific Plan shall be accompanied by an Environmental Review which includes an analysis of project impacts to include the following: air and water quality, biology, cultural resources, growth inducement, traffic, visual/aesthetics, and such other issues as required by the County of Imperial and other Responsible Agencies.

Zoning

The Wonderstone Aggregate Specific Plan land use zone includes "WAMP" Wonderstone Aggregate Mining and Processing. Uses and development standards are listed within the Wonderstone Aggregate Specific Plan. The implementing ordinance shall be the Imperial County Codified Ordinance, Title 9 (Land Use Ordinance), Division, 5, Chapter 1, Section 90501.17, with the Specific Plan identified as an "Exhibit".

Note: the Wonderstone Aggregate Specific Plan is currently going through the discretionary permitting process.

Small Scale Adopted and Developed Specific Plans

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Rio Bend

The Rio Bend Specific Plan is located at 1601 Drew Road, approximately 1,000 feet south of Interstate 8, approximately 1.5 miles southwest of the Community of Seeley. The existing development 1984 Rio Bend RV Resort Ranch, which had permitted the development of the Lakeview Golf Course and RV Park. The 1992 plan called for a more balanced community, which along with additional RV spaces included the development of commercial and single family residential areas. An amendment to the 1992 Specific Plan was done in 2001, The Development includes a 902 RV space park, 68 space mobile home park (971 total units), and a 9 hole golf course. Rio Bend Specific Plan was adopted on 07/07/1992.

NOTE: This plan is herewith incorporated into the County's General Plan as Appendix C.

Imperial Lakes (Ski Lakes)

The Imperial Lakes Specific Plan also known as Ski Lakes is located at 2828 Evan Hewes Hwy, approximately 5 miles west of the Community of Seeley. The Specific Plan is a gated residential community consisting of a 21 unit mobile home park subdivision and two ski style artificial lakes. Imperial Lakes Specific Plan was adopted on 06/27/1995.

NOTE: This plan is herewith incorporated into the County's General Plan as Appendix D.

McCabe Ranch

The McCabe Ranch Specific Plan is located on approximately 79 acres, at the northwest corner of the intersection of Correll Road and Dogwood Road, in the community of Heber. McCabe Ranch is a mixed residential density development, planned for 304 single family homes, and 127 multifamily units. The development of the 304 single family homes is over 70 percent completed. The multifamily component has not yet been developed. McCabe Ranch Specific Plan was adopted on 10/08/2000.

NOTE: This plan is herewith incorporated into the County's General Plan as Appendix E.

River Front

The River Front Specific Plan is located on approximately 80 acres, in the northeastern corner of Imperial County, approximately 33 miles south of the City of Blythe and 60 miles northeast of the City of El Centro. The site is on the east side of Walters Camp Road, approximately eight (8) miles southeast of Highway 78 and 13 miles south of the community of Palo Verde. The River Front Specific Plan consists of 34 single-family residential development centered around the

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recreational opportunities created by the Colorado River. Presently the project is still in the parcel mapping phase. The River Front Specific Plan was adopted on 02/04/2003.

NOTE: This plan is herewith incorporated into the County's General Plan as Appendix F.

II. EXISTING CONDITIONS AND TRENDS

A. Preface

Knowledge, experience and reasoned expectations of future conditions determines the scope of the issues that the Land Use Element must address. This chapter includes a generalized description of existing physical, cultural, and land use features within the County, from both a historic and expected future perspective.

B. Land Use/Population

Imperial County is, and will continue for the foreseeable future to be, a predominantly agricultural area, **although in 2003 a significant increase in urbanization began to show.** Presently, approximately one-fifth (534,328) of the nearly 3 million acres of the County is irrigated for agricultural purposes. In addition, approximately 50 percent of County lands are largely undeveloped and under federal ownership. The developed area where the County's incorporated cities, 'nincorporated communities, and supporting facilities are situated comprise less than one percent of the land (see Table 1).

Imperial County Planning & Development Services Department bases its population estimates on building permits and housing unit change. From this annual compilation, the Population Research Unit of the California Department of Finance (DOF) estimates the annual change in population. According to the Department of Finance's January 1, 2006, estimates, the population for the unincorporated area is 36,166 with the total population for Imperial County being 166,585. This compares to the 1990 census results of 27,339 for the unincorporated area with the total population for the County being 109,303 and the 2000 census results of 32,772 for the unincorporated area and 147,361 for the entire County (see Table 2). According to DOF 2006 figures, the average household size county-wide is approximately 3.32 persons per household, with the average in cities being 3.42 persons per household and the average in the unincorporated area being 2.96 persons per household.

Population in the unincorporated areas of the County tends to concentrate in agricultural areas and in recreation/retirement communities. Agricultural related communities include the townsites of Heber, Niland and Seeley in the Imperial Valley. Along the Colorado River, in the eastern portion of the County, small population clusters exist within the townsites of Palo Verde and Winterhaven.

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Appendix H: Calexico Water Code & Conservation Ordinances

City of Calexico 2015 Urban Water Management Plan

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IV. - WATER CONSERVATION

Chapter 13.40 - RESTRICTIONS ON OUTDOOR USE OF WATER DURING STATEWIDE DROUGHT CONDITIONS

Sections:

13.40.010 - Policy and purpose.

A. The purpose of this chapter is to establish a water conservation and supply shortage program that will reduce water consumption within the city and its service territory through conservation, enable effective water supply planning, assure reasonable and beneficial use of water, prevent waste of water, and maximize the efficient use of water within the city and its service territory to avoid and minimize the effect and hardship of water shortage to the greatest possible extent.

B. This chapter establishes permanent water waste and conservation standards intended to alter behavior related to water use efficiency at all times and further establishes two levels of water supply shortage response actions to be implemented during times of declared water shortage or declared water shortage emergency, with increasing restrictions on water use in response to worsening drought or emergency conditions and decreasing supplies.

C. The provisions of this chapter are intended to achieve consistency with California Code of Regulations, Title 23, Sections 863 through 865.

D. The provisions of this chapter shall be distinct and cumulative from, and remain consistent with Sections 13.24.010 and 13.24.020 and the city's adopted urban water management plan, concerning shortages in local water supply.

(Ord. No. 1155, § 2, 8-19-14; Ord. No. 1156, § 2, 9-2-14)

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13.40.020 - Definitions.

As used in this chapter, unless a different meaning is apparent from the context or is specified elsewhere in this Code, the following words shall have the following meanings:

A. "City" means the area within the territorial city limits of the city and such territory outside of this city over which the city has jurisdiction or for which the city water department provides water service.

B. "Council" means the city council of this city.

C. "Person" means any individual person or persons, corporation, public or private entity, governmental agency or institution, including all agencies and departments of the city, or any other user of water provided by the city water department.

D. "Customer" means any person, persons, association, corporation, or governmental agency supplied and billed for water service by the city water department.

E. "Department" means the city water department, its divisions, and its employees.

F. "Potable water" means water that is suitable for drinking.

G. "Recycled water" means the reclamation and reuse of non-potable water for beneficial use.

(Ord. No. 1155, § 2, 8-19-14; Ord. No. 1156, § 2, 9-2-14)

13.40.030 - Application.

The provisions of this chapter apply to any person in the use of any potable water provided by the department, except for the following water uses:

A. Water necessary for water system or fire suppression system testing and maintenance, or fire suppression and other similar emergency services affecting public health and safety.

B. Water necessary to protect public health and safety as determined in the discretion of the department and/or the council.

C. Any use of recycled water.

D. The use of water by commercial nurseries and commercial growers to sustain plants, trees, shrubs, crops or other vegetation intended for commercial use.

(Ord. No. 1155, § 2, 8-19-14; Ord. No. 1156, § 2, 9-2-14)

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13.40.040 - Water conservation plan implementation.

The department shall monitor and evaluate the projected supply and demand for water by its customers and any state proclamations regarding drought conditions. In the event of a water shortage and/or statewide drought, the department shall recommend that the council make a determination that a water shortage exists and that the level 2 water conservation plan shall take effect, as provided in this chapter. The council may discontinue any level or may implement another level as necessary. Upon a finding by the council that a water shortage no longer exists, any water shortage level then in effect shall terminate.

(Ord. No. 1155, § 2, 8-19-14; Ord. No. 1156, § 2, 9-2-14)

13.40.050 - Level 1 water conservation plan.

Under a level 1 water conservation plan, there are no outdoor water use restrictions and the level 2 water conservation plan restrictions specified in Section 13.40.060, shall not be applicable.

(Ord. No. 1155, § 2, 8-19-14; Ord. No. 1156, § 2, 9-2-14)

13.40.060 - Level 2 water conservation plan.

Under a level 2 water conservation plan, the following restrictions on a person's use of potable water shall apply:

A. Watering of lawns and ornamental landscapes shall be limited to three times per week on the following days:
   1. Properties located North of Highway 98 shall water on Tuesdays, Thursdays, and Saturdays only
   2. Properties located South of Highway 98 shall water on Mondays, Wednesdays, and Fridays only;
B. Watering of lawns and ornamental landscapes is prohibited between the hours of nine a.m. and six p.m.;
C. The application of potable water to outdoor landscapes in a manner that causes runoff such that water flows onto adjacent property, non-irrigated areas, private and public walkways, roadways, parking lots, or structures is prohibited;
D. The use of a hose that dispenses potable water to wash a motor vehicle is prohibited, unless the hose if fitted with a shut-off nozzle or other device attached to the hose that causes it to cease dispensing water immediately when not in use;
E. The application of potable water to driveways and sidewalks is prohibited;
F. The use of potable water in a fountain or decorative water feature is prohibited unless the water is re-circulated.

(Ord. No. 1155, § 2, 8-19-14; Ord. No. 1156, § 2, 9-2-14)

13.40.070 - Violation.

All means of enforcement authorized under this code may be used to address violations of this chapter, including, but not limited to: criminal actions, nuisance abatement, civil actions, and administrative citations. Violations of this chapter are punishable as an infraction and subject to fine of up to five hundred dollars per violation, per day.

(Ord. No. 1155, § 2, 8-19-14; Ord. No. 1156, § 2, 9-2-14)

13.40.080 - Reservation of rights.

The rights of the department hereunder shall be cumulative to any other right of the department to discontinue service.

(Ord. No. 1155, § 2, 8-19-14; Ord. No. 1156, § 2, 9-2-14)

13.40.090 - Public nuisance.

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In addition to the penalties provided in this chapter, any condition caused or permitted to exist in violation of any of the provisions of this chapter shall be deemed a public nuisance and may be, by the city, summarily abated as such, and each day such condition continues shall be regarded as a new and separate offense.

(Ord. No. 1155, § 2, 8-19-14; Ord. No. 1156, § 2, 9-2-14)

13.40.100 - Severability.

If any section, subsection, sentence, clause or phrase in this chapter is for any reason held invalid, the validity of the remainder of the chapter will not be affected. The council hereby declares it would have passed this chapter and each section, subsection, sentence, clause or phrase thereof irrespective of the fact that one or more sections, subsections, sentences, clauses or phrases or is declared invalid.

(Ord. No. 1155, § 2, 8-19-14; Ord. No. 1156, § 2, 9-2-14)

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Appendix I: Appendix N from IID's Integrated Regional Water Management Plan

City of Calexico 2015 Urban Water Management Plan

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INTEGRATED REGIONAL WATER MANAGEMENT PLAN

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Appendix N

IID Capital Projects

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Appendix N – IID Capital Projects

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Appendix N - IID Capital Project Alternatives

This appendix examines the opportunities and challenges of augmenting water supplies through the construction of capital projects. The conceptual projects evaluated in this section are: desalination of brackish water and recycling of municipal wastewater.

The desalted or recycled water would either be used directly by a new water demand (for example, a geothermal power plant), or would be delivered to a current use that would then forego the use of the Colorado River. Under the latter concept, desalted or recycled water produced would be provided to a current user in lieu of the delivery of Colorado River water delivered by IID. The water would be added to IID's overall water supply portfolio since it is a 'new' water supply that would have otherwise not been available. The new water produced could be credited to the regional water portfolio or to an industrial water account managed by IID. Water from the industrial water account could then be apportioned or credited to the new demands by IID. These new water users would pay for the projects and take delivery of raw Colorado River water from IID.

These projects are developed at a reconnaissance or concept level using the available data including site specific data provided by previous studies, communications with local agencies, and aerial photography. Unit cost data includes IID-specific data from the IID Definite Plan and cost curves developed by EPA (EPA 2001) and by Reclamation (Reclamation 2003).

The level of detail included in the definition of each project is intended to allow for identification of technical feasibility, major implementation challenges, approximate costs, and for comparison of the alternatives.

At this point in time, a consensus on the appropriate ranking criteria has not been developed. Thus, projects have not been eliminated unless there is clearly a fatal flaw.

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N.1 Desalination of Brackish Water

N.1.1 Purpose and Design Considerations

The purpose of this section is to evaluate opportunities to use brackish groundwater or drain water for MCI uses after desalination. It investigates a broad range of concepts for desalination of brackish water. Each project includes development of a brackish water source, a desalination plant, brine disposal, and conveyance of the product water to customers. Both groundwater and surface water from drains and rivers are evaluated as source water. The desalination plants are assumed to use reverse osmosis (RO) as the treatment process. Brine disposal either in evaporation ponds or by deep well injection in existing wells at geothermal plants or in new wells is examined. Consideration is given to delivering the desalted project water to geothermal power plants, general municipalities, industrial use, or to the IID distribution system.

N.1.1.1 Elements of desalination projects

This section describes the elements that were combined to configure this integrated set of project alternatives and design considerations. Project Scoping Report – Review and Evaluation of Water Management Strategies (June 2009) has a more complete description of the desalination, groundwater development, groundwater banking, and agricultural water management strategies that were used to configure this set of integrated project alternatives.

Source Water

Drainage and River Water

Even after implementation of the IID Definite Plan there will be opportunities to capture drain water before it reaches the New or Alamo River, or to divert water from the New or Alamo River before it reaches the Salton Sea. This would serve to prevent loss of this water and make it subject to management and delivery by IID. River diversions would be more complicated to develop and subject to impacts from flooding. Mitigation for the effects to drain or riparian habitats will likely be required and would be a significant cost component.

Groundwater Well Fields

Groundwater is considered a new source of supply for IID. Groundwater in the East Mesa area and central part of the Imperial Valley is brackish and unacceptable for direct use by MCI sectors without treatment. It is estimated that there is about 0.8 MAF in the shallow aquifer and up to 24 MAF of groundwater storage in the intermediate aquifer and deep aquifer. Of the groundwater in storage about 2 MAF has a low enough TDS to be developed for the desalination plants. The water quality in the deeper aquifer is of poor quality and should not be used for the source water supply.

Desalination of brackish groundwater would remove water currently in storage in the groundwater basin by virtue of the historical losses from the irrigation system delivery canals. Natural recharge is limited and the safe or sustained yield is negligible. Developing the groundwater would deplete groundwater storage over time and recharge projects may be developed to mitigate the groundwater pumping.

In certain locations within the Imperial Valley the groundwater temperatures can range from 180 to 300 degrees Fahrenheit. In order for the hot water to undergo the reverse osmosis process it will need to be cooled to around 100 degrees Fahrenheit. Without cooling, the water would damage the membranes.

The project yield would be based on the annual and total amount of water that is determined permissible for development based on how much water could be removed without causing negative consequences such as land subsidence. Three annual volumes were assumed and tested: 5,000 AFY, 25,000 AFY, and 50,000 AFY. To determine the number of wells needed to supply the desalination plants with enough source water to produce those volumes of product water. A plant efficiency had to be estimated. Factors that affect plant efficiency include TDS, groundwater temperature, and blending volume. With these variables the calculation of the plant efficiency was assumed to range from 70 to 80 percent. To determine the quantity of wells needed a 75 percent operating efficiency was assumed which indicates approximately 66,000

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AFY, 33,000 AFY, and 6,000 AFY of source water would be needed to achieve the desired volumes.

Well fields were sized and costs determined to produce these annual amounts. There are six areas that have been selected as potential locations for desalination plants and well fields. These locations were initially selected due to their proximity to KGRA. The desalination plant and well field locations are: South Brawley KGRA – Keystone, East Brawley KGRA, East Mesa, South Salton Sea KGRA, South Salton Sea – East, and the Heber KGRA.

The well fields were designed based on the detailed analysis of groundwater presented in Appendix B. Design assumptions were made based on available data gathered on aquifer characteristics, water quality, water temperature, location of KGRAs, conveyances, and surface water supplies.

Desalination Facilities

Based on the various desalination treatment technologies, RO is recommended for application to projects identified in the IID Plan. RO plants use semi-permeable membranes to separate fresh water from salt water. The brackish water is forced at very high pressures through tightly wrapped membranes to produce fresh water and a brine waste stream. Two concepts were investigated; large central plants and smaller satellite plants. Sitting considerations included:

- Types of available source water supply
- Proximity to the potential demands or markets for the water produced
- Access to power
- Avoidance of environmental constraints
- Land ownership
- Brine disposal

For purposes of comparison, desalination plant facilities were located near the KGRA since geothermal demands are anticipated to be the largest increase in water use over the planning period. The assumed TDS for the delivered water is 650 mg/L.

The evaluation of cost estimates were based on the U.S. Bureau of Reclamation's Desalting Handbook for Planners (Reclamation 2003). Based on this handbook, the most cost effective technology for desalting brackish water is RO. Significant factors affecting the cost of brackish water reverse osmosis plants include:

- The temperature of the source water: The brackish groundwater sources in the Imperial Valley are generally in the range of 180 to 300 degrees, although data is very limited. RO membranes are damaged by water temperatures over 100 degrees. It is feasible – at a cost and with a significant loss of water – to cool water with an initial temperature of 180 degrees with cooling towers. This investigation includes the cost of cooling source water to 100 degrees to avoid damage to the membranes.

- Suspended solids in the source water: Suspended solids need to be filtered out of the source water prior to the RO process. Thus, surface water requires significantly more filtering than groundwater.

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- TDS levels of the source water: The TDS level, and the levels of specific ions, impacts the selection of membranes and other details of the design. Also, the TDS level impacts the allowable blending of a source water. The TDS levels used in this investigation are based on limited data. It is likely that actual TDS levels vary enough to significantly affect cost.

- Desired TDS levels in the product water: This investigation has assumed that the product water will have a TDS level of 650 ppm, similar to that of Colorado River water. It is likely that if the IID pursues construction of a desalination plant there will be discussions and negotiations with the end user and a contract will be entered specifying the desired TDS. It is possible that the end user may be willing to pay the added cost of reducing TDS levels below those of the Colorado River.

- Post treatment: If the product water is to be delivered to a municipal and industrial system, then post treatment will be needed to control the corrosiveness of the water. If the product water is delivered to the IID's distribution system, it is likely that blending within the distribution system will solve this issue. Delivery to the distribution system will probably also eliminate the need for regulatory storage.

Conveyance/Use and Market

Alternative uses have been considered including geothermal, agricultural, and other municipal uses. Each will have variable conveyance costs.

If well fields were located adjacent to canals or drains that extend to the desalination plants, the drains could be used to convey source water to the plant instead of more costly piping. Capital project alternatives have been created that outline the use of this approach.

There are two concepts for the use of desalinated water. Desalinated water could be delivered directly to meet the water demands of proposed projects. Desalinated water could also be put into the IID canals, accounted for as new water in the IID portfolio, and then apportioned to proposed new demands for use even if not directly delivered to the point of demand.

Brine Disposal

Desalinated brackish groundwater or drain water may become a viable option, but there are a host of constraints related to brine concentrate management that would need to be overcome. The primary impediment to brackish water desalting is the need for infrastructure that would facilitate, in an environmentally acceptable way, the production of high quality water and the disposal of concentrate discharge. There are many existing facilities, both national and internationally, that have overcome the obstacle and have successfully been permitted.

For purposes of brine management resulting from inland facilities located within Imperial Valley, the major strategies for brine disposal would be limited to four general categories: 1) deep well injection with new wells, 2) deep well injection at existing or proposed power plants by co-locating, 3) evaporation ponds, and 4) salt disposal ponds at the Salton Sea being developed as part of the recovery strategy. These four general categories are further discussed below.

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1) Deep Well Injection with New Wells

Typically with the deep well injection method, desalting concentrate is injected into unusable groundwater aquifers through new wells installed in depths that vary from a few hundred feet to several thousand feet. An alternative to drilling new injection wells could involve utilizing existing geothermal wells that are no longer in use. Both alternatives can only occur in areas where large volumes of concentrate can be accepted by the aquifers. Therefore, additional study of the site specific geological and hydrological conditions is needed to determine the suitability of porous aquifers. Also the constituent makeup of the brine concentrate must be compatible with the aquifers and the injection wells.

This method of brine disposal is considered the most cost effective as compared with other systems in practice for land based desalination plants. However, there are drawbacks to this technology. The drawbacks include: 1) selection of suitable well site, 2) costs involved in conditioning the waste brine, 3) possibility of corrosion and subsequent leakage in well casing, 4) seismic activity that could cause damage to the well and subsequently result in groundwater contamination, and 5) uncertainty of well half-life.

Permits for deep well injection are regulated by the U.S. Environmental Protection Agency (EPA) and also mandated by the State in most cases. A National Pollutant Discharge Elimination System (NPDES) permit may be sufficient; however, the Underground Injection Control (UIC) program and State agencies may require additional permitting. For additional discussion on permitting and regulatory constraints refer to Appendix I, Regulatory and Permitting Requirements.

Using aquifers as storage for brine disposal requires the use of aquifers that are too saline to be used for drinking water or agricultural uses. Geothermal energy plants are currently using deep injection wells to dispose of brine from their facilities. To determine the proper location to site an injection well the depth to the saline aquifer needs to be known. The saline aquifer also needs a cap or impermeable layer above it to keep the water pumped for storage from migrating up into the drinking water aquifers.

2) Deep Well Injection with Existing Wells or Proposed Power Plants (co-location)

To determine the general depth within the different KGRA wells, logs from geothermal injection wells were analyzed to determine the depth of the aquifer they are using for storage. Based on six well logs throughout the central Imperial Valley the range for the injection well depths is from about 5,000 feet to 9,000 feet. The depth to the seals placed in the wells to prohibit the upward migration of the stored water ranges from 1,500 feet to 5,000 feet below ground surface. Due to the variability of the seal depths further research will be required to determine the well design and depth needed for the injection well. Depth will vary depending on the location in the Imperial Valley.

When a desalination plant is proposed to serve a small number of geothermal plants there may be opportunities for collaboration between the desalination plant and the geothermal plant. These opportunities may include joint use of facilities such as cooling towers and injection wells,

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optimization of water quality for the intended use, or more efficient use of power generated by the geothermal plant.

Surface water discharge is the most frequent discharge concentrate disposal method used for brackish water plants. It involves discharging the effluent directly into a larger body of water such as a river or a stream or to a power plant outfall system. The brine concentrate would be mixed with the power plant cooling water within the outfall line prior to the discharge. Power plants typically require substantial flows of cooling water; therefore, providing ample opportunity for mixing and dilution of the concentrate with the cooling water waste stream.

The Clean Water Act (CWA) has mandated the development of standards and regulations for all wastewater discharges to surface water. For desalination, a NPDES permit must be filed. In order to obtain the permit, the brine concentrate must meet water quality standards that apply to the body of water it will discharge to.

3) Evaporation Ponds

Evaporation ponds dispose of reject brine from inland desalination plants by discharging the concentrate to ponds, where it is evaporated to dryness for final disposal in an appropriately designated landfill for non-hazardous waste. It is generally suitable for small inland desalination plants located in arid and semi-arid areas due to high evaporation rates. Evaporation ponds are relatively easy to construct, require low maintenance and little operator attention. In many instances, evaporation ponds are frequently the least costly means of brine disposal, especially in areas with high evaporation rates and low land costs. Figure N-1 illustrates the anticipated quantity of salt generated as a function of volume brine stream. It is expected that 35 acres of land will be required per 1 MGD of capacity. Additional assumptions include approximately 25 to 33 percent brine generated from total product water.

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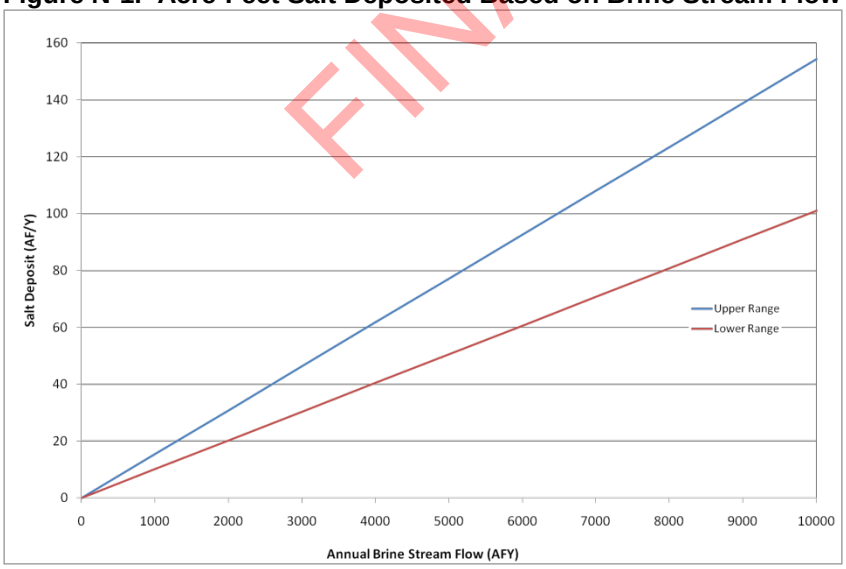
Figure N-1. Acre-Feet Salt Deposited Based on Brine Stream Flow



The principal environmental concern associated with evaporation pond disposal is the potential contamination of underlying potable water aquifers. The ponds generally require an impermeable liner, primarily composed of clay or synthetic materials, to prevent leakage. Double lining is strongly recommended with leakage sensing probes installed between layers of pond lining.

Another concern is the presence of sufficient concentrations of potentially toxic elements in the concentrate that may limit the use of this type of disposal. For example, in the San Joaquin

Valley, the presence of selenium in agricultural drainage water generally makes this form of disposal unacceptable. Other waste products, such as cleaning chemicals, produced by desalination plants may be mixed in with the reject brine.

Evaporation ponds do not require permits under the NPDES or UIC program, as long as the responsible party can provide conclusive evidence that no leakage will occur. Therefore, liner installation must be carried out with care since sealing of joints is critical in preventing leakage. Commonly, users of evaporation ponds acquire NPDES permits, rather than prove no leakage is possible.

4) Discharge to the Salton Sea

As part of the Salton Sea Restoration Project, the U.S. Bureau of Reclamation and the Salton Sea Authority conducted the Salton Sea Salinity Control Research Project (Project) at the Salton Sea Test Base from July 2000 until December 2002. The goal of this Project was to further understand the use of evaporation ponds to evaporate Salton Sea water, as well as to understand the issues related to disposing of the salt deposits that likely would be produced from using these systems or any other salt concentrating technology. To date, the Project facilities remain and are comprised of a series of interconnecting evaporation ponds and cells. The possibility of using existing evaporation ponds, co-located by the Salton Sea, exists and should be considered.

Another variation evaluating discharge to the Salton Sea is to directly discharge brine concentrate directly to the Sea. The Salton Sea is a congressionally authorized repository for irrigation drain water from the Imperial and Coachella Valleys, and currently receives about 1.3 million acre-feet (maf) of inflow annually and annually looses about this amount from evaporation. Most of the annual inflow is irrigation drain water with less than eight percent coming from annual precipitation within the basin (Cohen et al. 1999). There are three water quality issues associated with the Salton Sea: salinity, nutrient loading, and selenium.

Approximately four million tons of dissolved salts, 15,000 tons of nutrients (Cohen et al. 1999), and about 9 tons of selenium (Setmire and Schroeder 1998) enter the sea annually. Since its most recent filling in 1905, the Salton Sea has experienced several periods of fluctuating water levels. However, as economic pressures change and the need for domestic water in southern California continues to increase, it appears that a prolonged period of reduced inflow is currently underway. High evaporative loss (5 to 6 feet annually) and reduced inflow in the future has lead to reduced volume and surface area with increasing salinity levels. With the health of the Sea naturally diminishing and transforming more and more to a salt sink, utilizing the sea as a location to receive brine discharge becomes a consideration.

Further discussion on regulatory and permitting requirements associated with each brine disposal method is further discussed and summarized in Appendix I, Permitting and Regulatory Requirements.

Groundwater Recharge and Banking

To mitigate the effects of groundwater pumping in the East Mesa and to store a volume of water during under-run years, groundwater banking and recharge facilities could be used in the East

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Mesa area. These facilities could be constructed on the old unlined portion of the Coachella Canal or new ponds could be developed and used to recharge or bank water in the aquifer below the east mesa. Appendix B describes the characteristics of the aquifer beneath the East Mesa and the basis of design for the unlined canal recharge facilities.

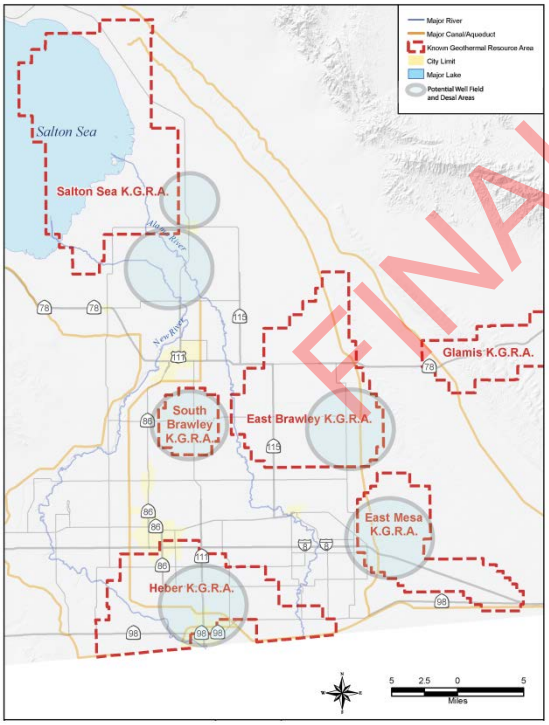
Based on historical data there is a potential for 15,000 to 250,000 AFY of under-run that could be banked by IID. Appendix F, created by NRCE, describes the quantity of water available for IID recharge and groundwater banking efforts.

In the future, banking efforts could also be conducted with CVWD by using banking and recharge facilities provided by CVWD; or new facilities constructed that would involve exchange with CVWD as described in the alternatives discussion below.

N.1.2 Project Alternatives

Table N-1 presents a matrix of project elements that were configured to build varying project alternatives within six different KGRAs. Each area was evaluated for a desalination plant is listed below with the reasons they have been considered (Figure N-2). The formulation of the capital project alternatives tests the relative costs of the major elements within each alternative. An equivalent annual cost of $600 per acre-foot or more or a yield less than 5,000 acre-feet/year is considered a fatal flaw. Details pertaining to aquifer hydraulic characteristics, well field design, water quality, and water temperature are located in Appendix B.

Figure N-2. Study Areas for Potential Capital Project Alternatives. Blue Ovals represent the general locations studied for Desalination Plant feasibility



The Keystone area was chosen for alternatives 1 through 6 because it is planned for future MCI development; agricultural lands are not as productive as other areas; this location would be able to obtain water from a well field, IID drains, or the Alamo River; and it is close to IID irrigation distribution facilities. Treated water could also be used directly for MCI purposes.

The East Brawley KGRA area was selected for alternatives 7 through 10 because it is planned for future geothermal development; this location would be able obtain water from a well field, and it is close to IID irrigation distribution facilities. Treated water could also be used directly for MCI purposes. The well field is located in East Brawley KGRA which is adjacent to the East Mesa and would benefit from recharge efforts in the East Mesa.

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The East Mesa KGRA was selected for alternatives 11 through 13 because of the proximity to geothermal power plants; this location would be able obtain water from a well field. Treated water could also be used for agricultural use.

The South Salton Sea KGRA area was selected for alternatives 14 and 15 because of the proximity to geothermal power plants and would be able to obtain water from the Alamo River. The use of surface water would not impact the groundwater basin therefore would not cause groundwater depletion or subsidence. Treated water could be used for municipal and industrial use.

The South Salton Sea KGRA – East Side area was selected for alternative 16 because of the proximity to geothermal power plants and source water would be obtained from a small well field. Treated water could be used for municipal and industrial use.

The Heber KGRA area was selected for alternative 17 because of the proximity to geothermal power plants and source water would be obtained from a small well field. Treated water could be used for municipal and industrial use.

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Table N-1. Alternative Configurations

Design Components "Cost Elements"	Keystone						East Brawley				East Mesa			South Salton Sea		East South Salton	Heber	East Mesa	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Desalination Plant																		Groundwater Blending	Groundwater Blending
1 Central Plant Keystone																			
2 Central Plant East Brawley KGRA Area																			
3 Central Plant South of South Salton Sea KGRA Area																			
4 Central Plant East Mesa KGRA																			
5 Satellite Plant East Mesa KGRA																			
6 Satellite Plant South Salton Sea KGRA Area																			
7 Satellite Heber																			
Yield																			
1 50,000 AFY																			
2 25,000 AFY																			
3 5,000 AFY																			
Source Water																			
Groundwater																			
1 South Salton Sea - Shallow Aquifer - 200 gpm																			
2 South Salton Sea - Intermediate Aquifer - 350 gpm																			
3 Heber - Intermediate Aquifer - 350 gpm																			
4 East Mesa - Intermediate Aquifer - 2,000 gpm																			
5 East Brawley - Intermediate Aquifer - 2,000 gpm																			
a Large well field																			
b Small well field																			
Surface Water																			
6 Drainwater																			
7 New River Water																			
8 Alamo River Water																			
Conveyance																			
Agricultural																			
1 IID Irrigation Systems A: Bryant, Redwood, Rose Canals																			
2 IID Irrigation Systems B: East Highline & Laterals																			
3 IID Irrigation System C:																			
Municipal																			
4 Municipal Distribution																			
Industrial																			
5 Industrial Use (Geothermal)																			
Brine Disposal																			
1 New Well (s)																			
2 Existing Geothermal Cooperators																			
3 Evaporation Ponds																			
Groundwater Recharge																			
1 Coachella Canal																			
2 Percolation Basins																			
3 No Recharge																			
Costs (May 2009 Price Level)																			
Capital Cost	$281,817,834	$282,399,468	$306,357,788	$147,437,743	$372,088,101	$160,695,766	$100,409,542	$100,991,177	$162,175,609	$24,751,185	$111,746,590	$112,318,224	$33,027,263	$158,619,378	$182,975,327	$62,177,086	$95,899,356	$39,501,517	$48,605,551
Annual O&M costs	$13,149,000	$13,158,000	$13,518,000	$15,323,901	$10,232,000	$7,061,000	$6,157,000	$6,166,000	$7,084,000	$1,325,000	$6,327,000	$6,336,000	$1,648,000	$15,491,901	$15,857,901	$1,971,000	$2,476,000	$198,000	$243,000
Equivalent annual capital cost	$16,298,000	$16,331,000	$17,717,000	$8,526,000	$21,518,000	$9,293,000	$5,807,000	$5,840,000	$9,379,000	$1,431,000	$6,462,000	$6,495,000	$1,910,000	$9,173,000	$10,581,000	$3,596,000	$827,000	$2,482,000	$3,054,000
Equivalent annual cost per acre-foot	**$589**	**$590**	**$625**	**$477**	**$1,270**	**$654**	**$479**	**$480**	**$659**	**$591**	**$512**	**$513**	**$712**	**$493**	**$529**	**$1,113**	**$661**	**$99**	**$122**

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N.1.2.1 Desal Alternative 1- 50,000 AF Keystone Desalination with Well Field

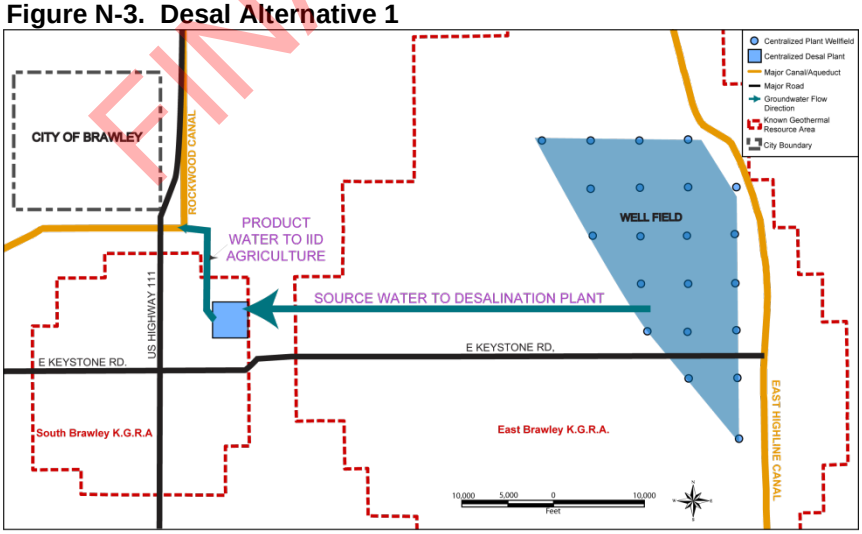
Description

A 50,000 AF Desalination Plant would be located in the South Brawley KGRA. The exact location has not been determined (Figure N-3). The facility was sited to allow for estimation of conveyance costs. The purpose of this alternative is to develop the cost for providing 50,000 AFY of groundwater to a desalination plant without the use of recharge or groundwater banking facilities. The source water would be from a well field located in the East Brawley KGRA and consisting of 21 wells drilled to an average depth of 900 feet, producing 2,000 gpm for a total production capacity of about 42,000 gpm. The wells were located to avoid impacts to habitat and permitting issues related to BLM lands. The wells are connected by pipelines leading to an 11 mile trunk line that will convey the water to the plant; would be sited in existing easements and rights-of-way; and will cross the Alamo River. Total dissolved solids concentration of 1,900 mg/L is assumed. Water temperature from this well configuration is anticipated to be about 170 degrees Fahrenheit. This will necessitate cooling the water prior to treatment to protect membranes and maintain plant efficiency.

The produced water would be conveyed to IID facilities for distribution to agricultural uses. Brine disposal will be through injection of the water to the deeper, highly saline formations beneath the plant using five new injection wells. If geothermal plants were to be co-located in the future, there could be an opportunity to partner on wells that would recover the hot water and inject the brine stream from the Desalination Plant.

This alternative relying solely on groundwater would result in a large groundwater depletion and decline in groundwater levels that could lead to migration of poor quality water and/or land subsidence. Because this was an unacceptable level of impact this was considered a fatal flaw and this project alternative was eliminated from further consideration.

Figure N-3. Desal Alternative 1



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Costs

Table N-2. Desal Alternative 1 – 50KAF Keystone Desalination with Well Field (May 2009 price level, 4% real interest rate, 30 year project life)

Direct Capital Costs, May 2009 Price Level	Total
Desal Plant	70,700,000
Source water development, collection and transmission - well water	142,519,509
Recharge Facilities	-
Concentrate Disposal - New Injection Wells	9,000,000
Mitigation Costs (reduced flow from drains)	-
Product Water Distribution	10,968,000
Working capital (2 months of O&M costs per Reclamation, Page D-20)	1,490,000
Direct Capital Costs May 2009 Price Level	$ 234,677,509
Indirect Capital Costs (as percent of direct costs UON)	
Freight and Insurance 5 % of direct capital cost	4,160,000
Owner's direct expense, 10 % of direct capital cost	23,470,000
Construction Overhead, 15 % of direct capital cost	12,470,000
Interest During Construction for half of construction period	7,040,325
Indirect Capital Costs (as percent of direct costs UON)	$ 47,140,325
Capital Cost	$ 281,817,834
Annual O&M costs, May 2009 Price Level	$ 13,149,000
Financial Analysis - cost per acre-foot	
Equivalent annual cost	$ 29,447,000
Product Water, acre-feet	50,000
Equivalent annual cost per acre-foot	**$ 589**
Unacceptable decline in groundwater levels.	**Not Feasible**

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N.1.2.2 Desal Alternative 2 - 50,000 AF Keystone Desalination with Well Field and Groundwater Recharge

Description

The purpose of this alternative is to add groundwater recharge and groundwater banking facilities to the East Mesa to minimize the potential negative effects on the groundwater basin and reduce groundwater depletion. It has the same groundwater source elements as discussed in alternative 1. For purpose of the analysis, it was assumed that the old Coachella Canal would be developed to provide for recharge and banking of Colorado River water that is available in years where there is an under-run (Figure N-4). The amount of Colorado River water to be banked was assumed to vary from 15,000 AFY to 250,000 AFY based on the analysis described previously.

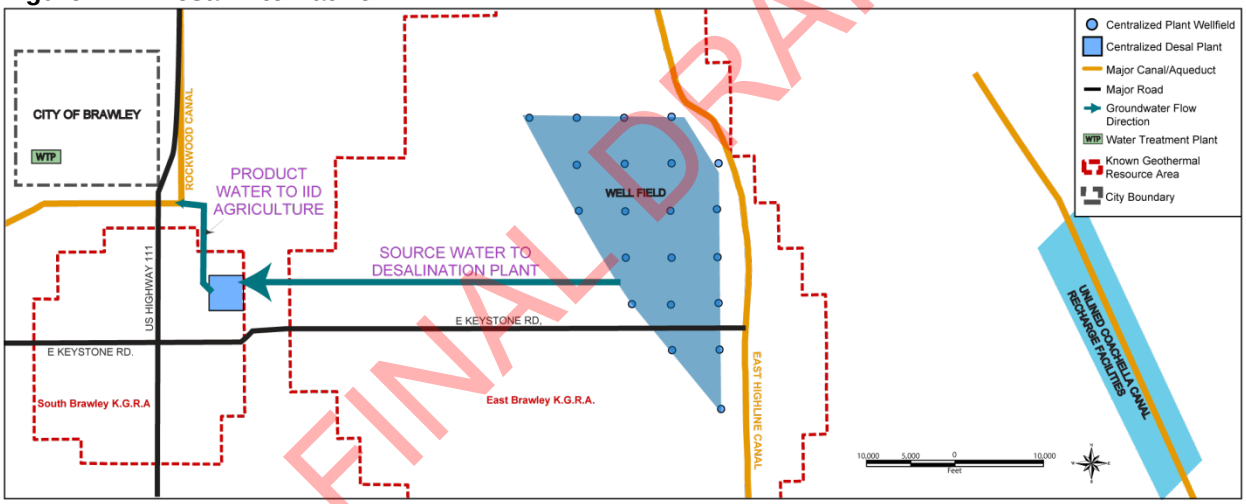
New East Mesa Recharge Ponds. The project goal would be to mitigate for 50,000 AFY of the groundwater impacts but there could still be some depletion of the groundwater basin. The aquifer is currently full and some period of groundwater development may be needed to optimize groundwater recharge operations. IID development, management and operations of local groundwater recharge facilities have multiple benefits and the feasibility of recharge in the East Mesa merits further review. The alternative is technically feasible and will be further compared to other alternatives.

Appendix F describes the potential under-runs that may be available for groundwater recharge and different groundwater banking scenarios.

Variants

A variant on this theme would be to develop dedicated groundwater recharge basins in the East Mesa. This would be constrained due to ownership and management by the Bureau of Land Management (BLM), the existence of sensitive habitats, and ability to obtain easements and rights-of-way. There could be a possibility for land exchange to overcome some of the potential constraints.

Figure N-4. Desal Alternative 2



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Costs

Table N-3. Desal Alternative 2 – 50KAF Keystone Desalination with Well Field and Groundwater Recharge (May 2009 price level, 4% real interest rate, 30 year project life)

Direct Capital Costs, May 2009 Price Level	Total
Desal Plant	70,700,000
Source water development, collection and transmission - well water	142,540,389
Recharge Facilities	417,600
Concentrate Disposal - New Injection Wells	9,000,000
Mitigation Costs (reduced flow from drains)	-
Product Water Distribution	10,968,000
Working capital (2 months of O&M costs per Reclamation, Page D-20)	1,490,000
Direct Capital Costs, May 2009 Price Level	$ 235,115,989
Indirect Capital Costs (as percent of direct costs UON)	
Freight and Insurance 5 % of direct capital cost	4,180,000
Owner's direct expense, 10 % of direct capital cost	23,510,000
Construction Overhead, 15 % of direct capital cost	12,540,000
Interest During Construction for half of construction period	7,053,480
Indirect Capital Costs (as percent of direct costs UON)	$ 47,283,480
Capital Cost	$ 282,399,468
Annual O&M costs, May 2009 Price Level	$ 13,158,000
Financial Analysis - cost per acre-foot	
Equivalent annual cost	$ 29,489,000
Product Water, acre-feet	50,000
Equivalent annual cost per acre-foot	**$ 590**

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N.1.2.3 Desal Alternative 3 - 50,000 AF Keystone Desalination with Well Field, Groundwater Recharge and MCI Distribution

Description

The purpose of this alternative is to use the same elements as alternative 2 with the addition of delivery of product water to municipal and industrial users (Figure N-5). The water will be conveyed by pipelines leading to the local water treatment plants for distribution to the Keystone development and the City of Brawley.

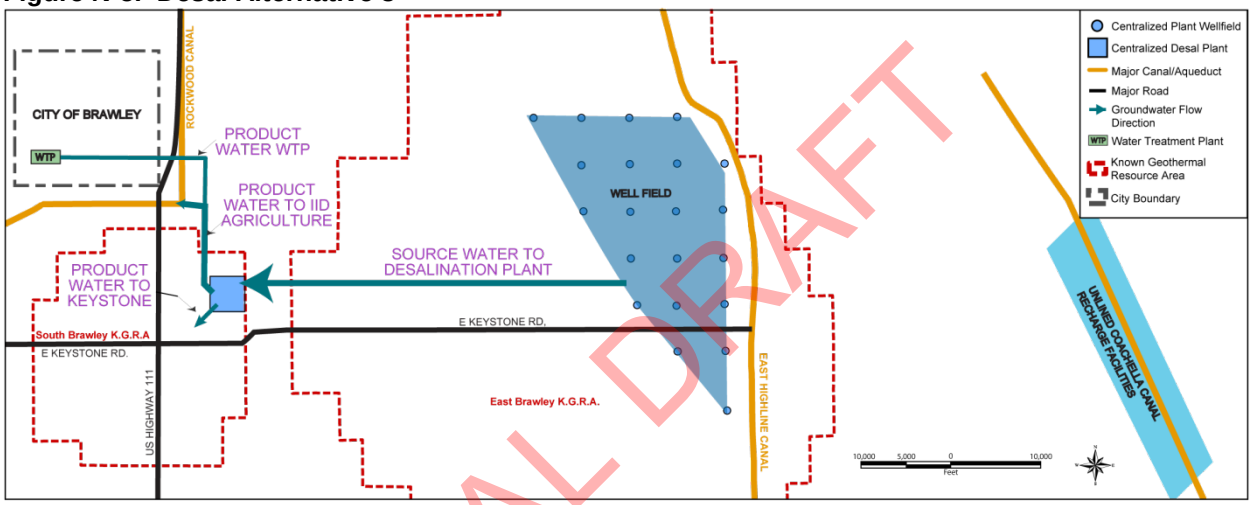
The delivery of the product water to the water treatment plants would require further planning to evaluate the quantity of water that can be accepted by the plants and to determine the quantity of water needed for municipal and industrial use.
Though technically feasible, this project exceeded to $600/AF cost threshold and is infeasible.

Variants

- **New East Mesa Recharge Ponds.** A variant on this theme would be to develop dedicated groundwater recharge basins in the East Mesa.

- **Municipal Water Delivery.** A variant on this alternative would be to supply the cities of Imperial, El Centro and Calexico with product water. This could result in future economies of scale. Additional benefits could be related to increased reliability of MCI supply in the event of catastrophic failure of the All American Canal. Further research would need to be conducted to cost this addition to the alternative and to determine the quantity that would be required for delivery.

Figure N-5. Desal Alternative 3



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Costs

Table N-4. Desal Alternative 3 – 50KAF Keystone Desalination with Well Field and Groundwater Recharge and MCI Distribution (May 2009 price level, 4% real interest rate, 30 year project life)

Direct Capital Costs, May 2009 Price Level	Total
Desal Plant	70,700,000
Source water development, collection and transmission - well water	143,404,389
Recharge Facilities	417,600
Concentrate Disposal - New Injection Wells	9,000,000
Mitigation Costs (reduced flow from drains)	-
Product Water Distribution	28,248,000
Working capital (2 months of O&M costs per Reclamation, Page D-20)	1,490,000
Direct Capital Costs, May 2009 Price Level	$ 253,259,989
Indirect Capital Costs (as percent of direct costs UON)	
Freight and Insurance 5 % of direct capital cost	5,040,000
Owner's direct expense, 10 % of direct capital cost	25,330,000
Construction Overhead, 15 % of direct capital cost	15,130,000
Interest During Construction for half of construction period	7,597,800
Indirect Capital Costs (as percent of direct costs UON)	$ 53,097,800
Capital Cost	$ 306,357,788
Annual O&M costs, May 2009 Price Level	$ 13,518,000
Financial Analysis - cost per acre-foot	
Equivalent annual cost	$ 31,235,000
Product Water, acre-feet	50,000
Equivalent annual cost per acre-foot	**$ 625**

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N.1.2.4 Desal Alternative 4- 50,000 AF Keystone Desalination with Alamo River

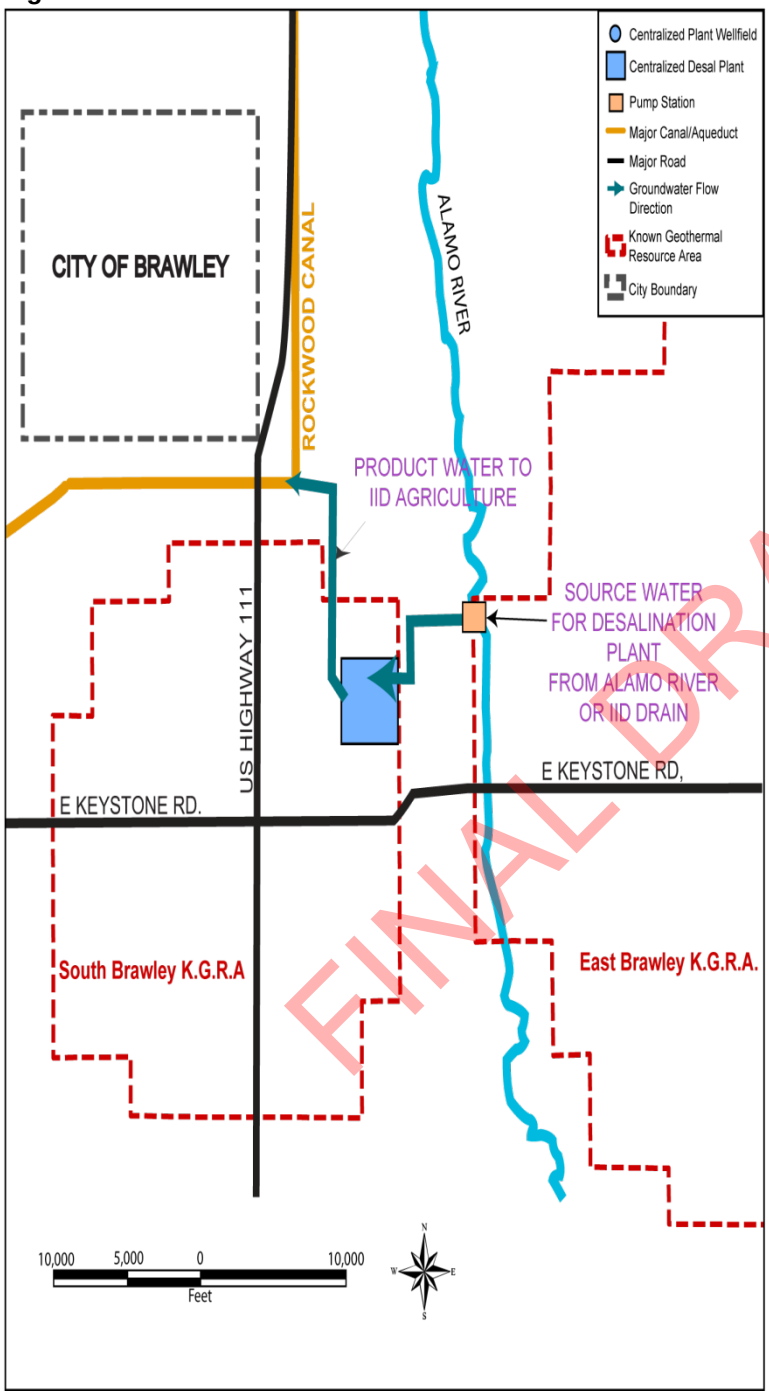
Description

The purpose of this alternative would be to supply a 50,000 AFY desalination plant with a surface water supply from the Alamo River (Figure N-6). This alternative would not impact the groundwater aquifer. The plant would be located in the South Brawley KGRA and the exact location has not been determined. The facility was sited to allow for estimation of conveyance costs. The source water from the Alamo River would have an assumed TDS of about 3,000 mg/L. Water temperature from the river is anticipated to be about 75 degrees Fahrenheit which will not necessitate cooling the water prior to treatment.

The product water would be conveyed to IID facilities for distribution to agricultural uses. Brine disposal will be through injection of the water to the deeper, highly saline formations beneath the plant using five new injection wells. If geothermal plants were to be co-located in the future,

there could be an opportunity to partner on wells that would inject the brine stream from the Desalination Plant.

Figure N-6. Desal Alternative 4



Variants

- **IID Drain Water Capture.**

A variant on this alternative would be the use of source water collected from IID drains instead of the Alamo River. Under this concept approximately 60,000 AF would be collected from a canal near the terminus of the Rose, Holtville, and Central drain. Sump pumps would be installed at the Rose and Holtville drains near the Alamo River to control impacts related to loss of drain water. Central drain water would be collected and conveyed down the Mesquite Drain for collection at the Rose Drain sump. This variant may have less regulatory constraints and may be more cost effective as compared to an Alamo River diversion. Further research would be needed to determine if the Alamo River or the IID drains are the best source for the desalination plant source water.

Costs

Table N-5. Desal Alternative 4 – 50KAF Keystone Desalination with Alamo River (May 2009 price level, 4% real interest rate, 30 year project life)

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Direct Capital Costs, May 2009 Price Level	Total
Desal Plant	71,450,000
Source water development and transmission - surface water collection	10,356,408
Recharge Facilities	-
Concentrate Disposal - New Injection Wells	9,000,000
Mitigation Costs (reduced flow from drains)	9,980,391
Product Water Distribution	10,968,000
Working capital (2 months of O&M costs per Reclamation, Page D-20)	2,010,000
Direct Capital Costs, May 2009 Price Level	$ 113,764,799
Indirect Capital Costs (as percent of direct costs UON)	
Freight and Insurance 5 % of direct capital cost	4,720,000
Owner's direct expense, 10 % of direct capital cost	11,380,000
Construction Overhead, 15 % of direct capital cost	14,160,000
Interest During Construction for half of construction period	3,412,944
Indirect Capital Costs (as percent of direct costs UON)	$ 33,672,944
Capital Cost	$ 147,437,743
Annual O&M costs, May 2009 Price Level	$ 15,323,901
Financial Analysis - cost per acre-foot	
Equivalent annual cost	$ 23,849,901
Product Water, acre-feet	50,000
Equivalent annual cost per acre-foot	**$ 477**

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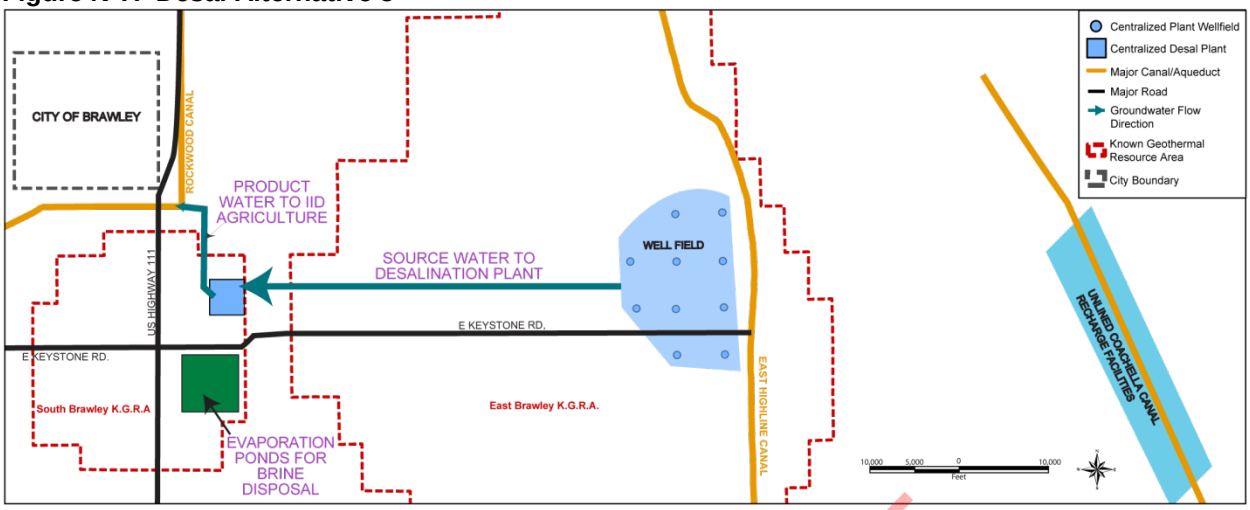
N.1.2.5 Desal Alternative 5 - 25,000 AF Keystone Desalination with Well Field, Groundwater Recharge and Evaporation Ponds

Description

The purpose of alternative 5 is to use the elements from alternative 1 with three changes (Figure N-7). The quantity of wells will be reduced from 21 to 10 to supply 25,000 AFY of product water. Groundwater recharge and banking facilities are included in the East Mesa to minimize the potential negative effects on the groundwater basin and reduce groundwater depletion. For purpose of the analysis, it was assumed that the old Coachella Canal would be developed to provide for recharge and banking of Colorado River water that is available in years where there is an under-run. The amount of Colorado River water to be banked was assumed to vary from 15,000AFY to 250,000 AFY. Appendix F describes the potential under-runs that may be available for groundwater recharge and different groundwater banking scenarios. The third addition is the use of evaporation basins instead of injection wells to dispose of the brine water.

The alternative is not economically feasible due to the cost of the evaporation ponds.

Figure N-7. Desal Alternative 5



Variants

- **New East Mesa Recharge Ponds.** A variant on this theme would be to develop dedicated groundwater recharge basins in the East Mesa.

- **Salton Sea Salt Disposal Ponds.** A variant on the evaporation basins would be to create evaporation basins in conjuncture with the Salton Sea Restoration plan. The brine could be disposed in borrow pits that may be created during the restoration process. This variant will require further research to determine its feasibility and practicality. Using Figure N-1 it is expected that 35 acres of land will be required per 1 MGD of capacity. Further research needs to be conducted to determine the feasibility of this variant.

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Costs

Table N-6. Desal Alternative 5 – 25KAF Keystone Desalination with Well Field, Groundwater Recharge and Evaporation (May 2009 price level, 4% real interest rate, 30 year project life)

Direct Capital Costs, May 2009 Price Level	Total
Desal Plant	42,940,000
Source water development, collection and transmission - well water	77,213,197
Recharge Facilities	417,600
Concentrate Disposal - Evaporation ponds, not including land cost	155,710,000
Land Cost for evaporation ponds	5,780,000
Mitigation Costs (reduced flow from drains)	-
Product Water Distribution	8,536,000
Working capital (2 months of O&M costs per Reclamation, Page D-20)	780,000
Direct Capital Costs with Contingency, May 2009 Price Level	$ 291,376,797
Indirect Capital Costs (as percent of direct costs UON)	
Freight and Insurance 5 % of direct capital cost	10,710,000
Owner's direct expense, 10 % of direct capital cost	29,140,000
Construction Overhead, 15 % of direct capital cost	32,120,000
Interest During Construction for half of construction period	8,741,304
Indirect Capital Costs (as percent of direct costs UON)	$ 80,711,304
Capital Cost	$ 372,088,101
Annual O&M costs, May 2009 Price Level	$ 10,232,000
Financial Analysis - cost per acre-foot	
Equivalent annual cost	$ 31,750,000
Product Water, acre-feet	25,000
Equivalent annual cost per acre-foot	**$ 1,270**

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N.1.2.6 Desal Alternative 6 - 25,000 AF Keystone Desalination with Well Field

Description

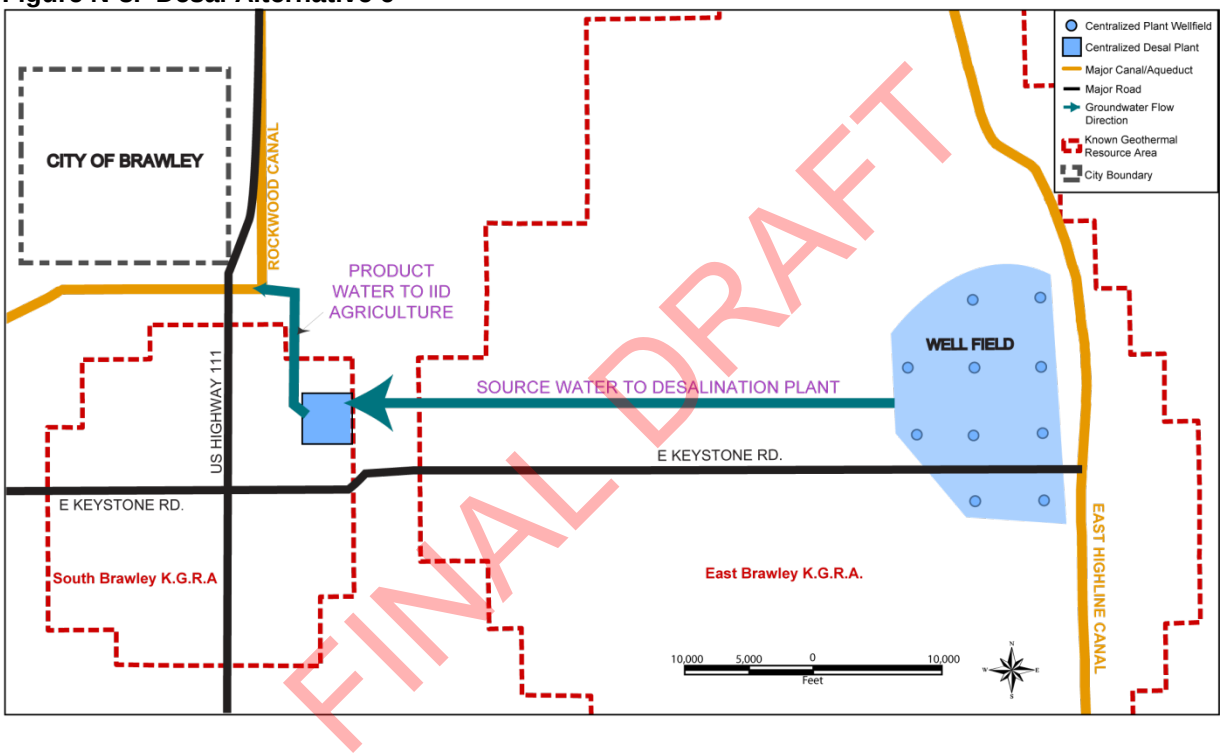
The purpose of this alternative was to use the elements in alternative 1 and compare the feasibility of using a 25,000 AFY desalination plant located in the South Brawley KGRA instead of a 50,000 AFY plant (Figure N-8). The exact location has not been determined. The facility was sited to allow for estimation of conveyance costs. The source water would be from a well field located in the East Brawley KGRA and consisting of 10 wells drilled to an average depth of 900 feet producing 2,000 gpm for a total production capacity of about 21,000 gpm. The project would pump 750,000 AF over the 30-year project life. The wells are connected by pipelines leading to an 11-mile trunk line that will convey the water to the plant; would be sited in existing easements and rights-of-way; and will cross the Alamo River. Total dissolved solids concentration of 1,900 mg/L is assumed. Water temperature from this well configuration is

anticipated to be about 170 degrees Fahrenheit. This will necessitate cooling the water prior to treatment to protect membranes and maintain plant efficiency.

The produced water would be conveyed to IID facilities for distribution to agricultural uses. Brine disposal will be through injection of the water to the deeper, highly saline formations beneath the plant using three new injection wells. If geothermal plants were to be co-located in the future, there could be an opportunity to partner on wells that would inject the brine stream from the Desalination Plant.

This project would rely solely on groundwater and would result in groundwater depletion. The project exceeds the $600 per AF threshold and is eliminated from future consideration.

Figure N-8. Desal Alternative 6



Costs

Table N-7. Desal Alternative 6 – 25KAF Keystone Desalination with Well Field (May 2009 price level, 4% real interest rate, 30 year project life)

Direct Capital Costs, May 2009 Price Level	Total
Desal Plant	42,940,000
Source water development, collection and transmission - well water	77,192,317
Recharge Facilities	-
Concentrate Disposal - New Injection Wells	5,400,000
Mitigation Costs (reduced flow from drains)	-
Product Water Distribution	6,936,000
Working capital (2 months of O&M costs per Reclamation, Page D-20)	780,000
Direct Capital Costs, May 2009 Price Level	$ 133,248,317
Indirect Capital Costs (as percent of direct costs UON)	
Freight and Insurance 5 % of direct capital cost	2,530,000
Owner's direct expense, 10 % of direct capital cost	13,320,000
Construction Overhead, 15 % of direct capital cost	7,600,000
Interest During Construction for half of construction period	3,997,449
Indirect Capital Costs (as percent of direct costs UON)	$ 27,447,449
Capital Cost	$ 160,695,766
Annual O&M costs, May 2009 Price Level	$ 7,061,000
Financial Analysis - cost per acre-foot	
Equivalent annual cost	$ 16,354,000
Product Water, acre-feet	25,000
Equivalent annual cost per acre-foot	**$ 654**

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N.1.2.7 Desal Alternative N - 25,000 AF East Brawley Desalination with Well Field

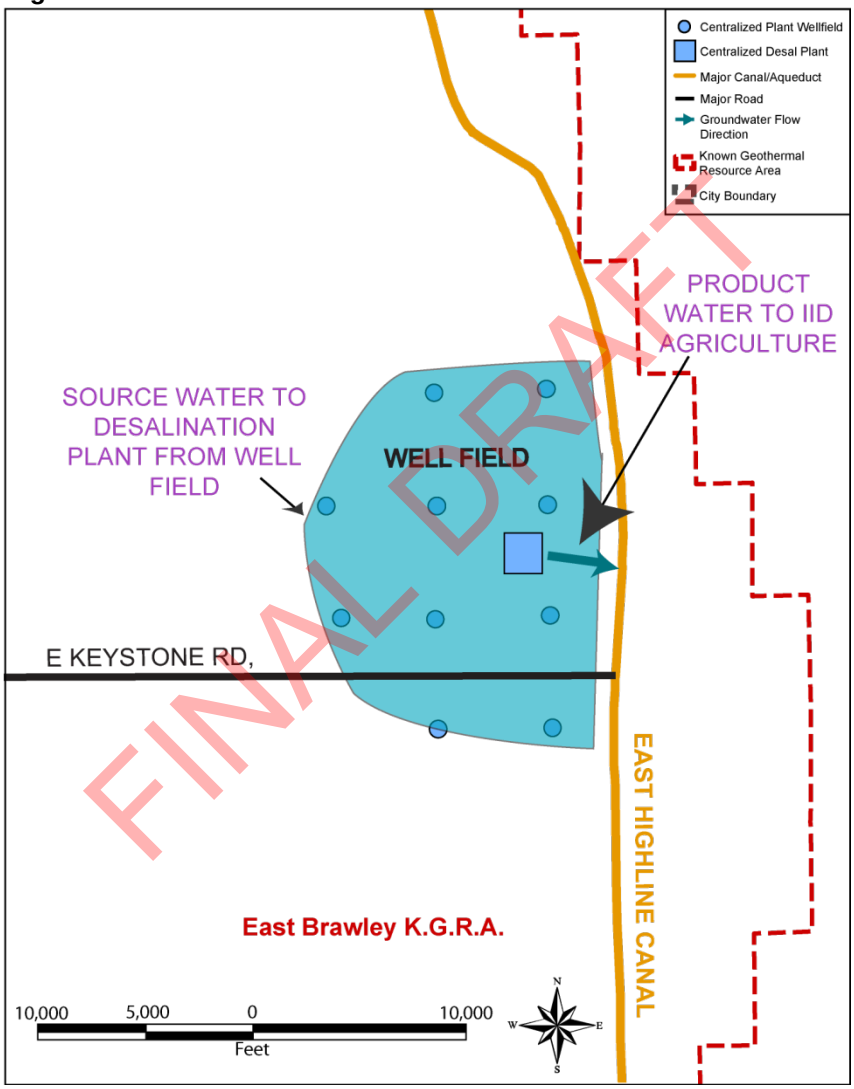
Description

The purpose of this alternative is to determine the feasibility of a 25,000 AFY desalination plant located in the East Brawley KGRA using groundwater without recharge or groundwater banking facilities (Figure N-9). The exact location has not been determined. The facility was sited to allow for estimation of conveyance costs. The source water would be from a well field located in the East Brawley KGRA and consisting of 10 wells drilled to an average depth of 900 feet producing 2,000 gpm for a total production capacity of about 21,000 gpm. The wells are connected by pipelines to convey the water to the plant; would be sited in existing easements and rights-of-way. Total dissolved solids concentration of 1,900 mg/L is assumed. Water temperature from this well configuration is anticipated to be about 170 degrees Fahrenheit. This will necessitate cooling the water prior to treatment to protect membranes and maintain plant efficiency.

The produced water would be conveyed to IID facilities for distribution for agricultural uses. Brine disposal will be through injection of the water to the deeper, highly saline formations beneath the plant using three new injection wells. If geothermal plants were to be co-located in the future, there could be an opportunity to partner on wells that would recover the hot water and inject the brine stream from the Desalination Plant.

This project would rely solely on groundwater and would result in large groundwater depletion.

Figure N-9. Desal Alternative 7



Costs

Table N-8. Desal Alternative 7 – 25KAF East Brawley Desalination with Well Field (May 2009 price level, 4% real interest rate, 30 year project life)

Direct Capital Costs, May 2009 Price Level	Total
Desal Plant	42,940,000
Source water development, collection and transmission - well water	31,635,517
Recharge Facilities	-
Concentrate Disposal - New Injection Wells	5,400,000
Mitigation Costs (reduced flow from drains)	-
Product Water Distribution	312,000
Working capital (2 months of O&M costs per Reclamation, Page D-20)	780,000
Direct Capital Costs, May 2009 Price Level	$ 81,067,517
Indirect Capital Costs (as percent of direct costs UON)	
Freight and Insurance 5 % of direct capital cost	2,200,000
Owner's direct expense, 10 % of direct capital cost	8,110,000
Construction Overhead, 15 % of direct capital cost	6,600,000
Interest During Construction for half of construction period	2,432,025
Indirect Capital Costs (as percent of direct costs UON)	$ 19,342,025
Capital Cost	$ 100,409,542
Annual O&M costs, May 2009 Price Level	$ 6,157,000
Financial Analysis - cost per acre-foot	
Equivalent annual cost	$ 11,964,000
Product Water, acre-feet	25,000
Equivalent annual cost per acre-foot	**$ 479**

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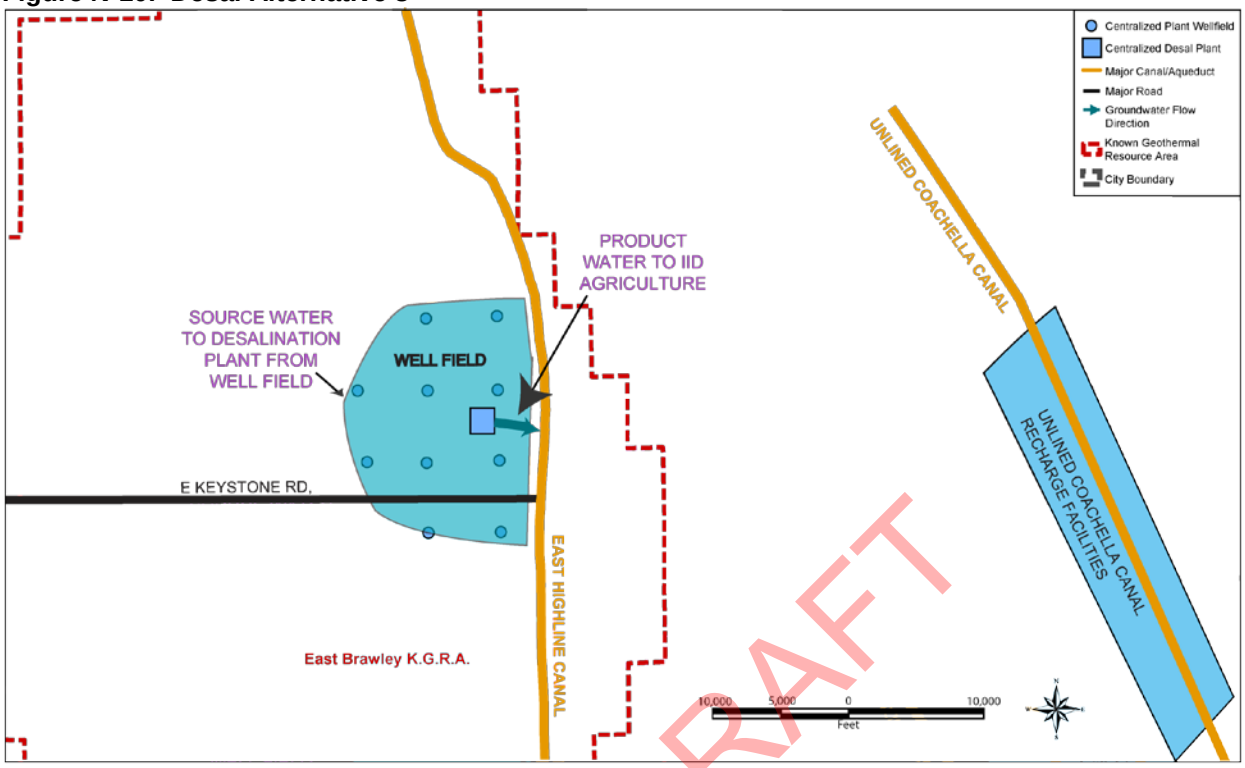
N.1.2.8 Desal Alternative 8 - 25,000 AF East Brawley Desalination with Well Field and Groundwater Recharge

Description

The purpose of this alternative is to use the elements from alternative 7 and add groundwater recharge facilities in the East Mesa to mitigate groundwater pumping effects (Figure N-10). For purpose of the analysis, it was assumed that the old Coachella Canal would be developed to provide for recharge and banking of Colorado River water that is available in years where there is an under-run. The amount of Colorado River water to be banked was assumed to vary from 15,000 AFY to 250,000 AFY based on the analysis described previously. Appendix F describes the potential under-runs that may be available for groundwater recharge and different groundwater banking scenarios.

Figure N-10. Desal Alternative 8



This project would mitigate for most of the groundwater impacts but could result in some groundwater depletion of the groundwater basin. The aquifer is currently full and some period of groundwater development may be needed to optimize groundwater recharge operations. IID development, management, and operations of local groundwater recharge facilities have multiple benefits and the feasibility of recharge in the East Mesa merits further review.

Variants

East Mesa Recharge Facilities. A variant on this theme would be to develop dedicated groundwater recharge basins in the East Mesa. This would be constrained due to ownership and management by the BLM, the existence of sensitive habitats, and ability to obtain easements and rights-of-way. There could be a possibility for land exchange to overcome some of the potential constraints.

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Costs

Table N-9. Desal Alternative 8 – 25KAF East Brawley Desalination with Well Field and Groundwater Recharge (May 2009 price level, 4% real interest rate, 30 year project life)

Direct Capital Costs, May 2009 Price Level	Total
Desal Plant	42,940,000
Source water development, collection and transmission - well water	31,656,397
Recharge Facilities	417,600
Concentrate Disposal - New Injection Wells	5,400,000
Mitigation Costs (reduced flow from drains)	-
Product Water Distribution	312,000
Working capital (2 months of O&M costs per Reclamation, Page D-20)	780,000
Direct Capital Costs, May 2009 Price Level	$ 81,505,997
Indirect Capital Costs (as percent of direct costs UON)	
Freight and Insurance 5 % of direct capital cost	2,220,000
Owner's direct expense, 10 % of direct capital cost	8,150,000
Construction Overhead, 15 % of direct capital cost	6,670,000
Interest During Construction for half of construction period	2,445,180
Indirect Capital Costs (as percent of direct costs UON)	$ 19,485,180
Capital Cost	$ 100,991,177
Annual O&M costs, May 2009 Price Level	$ 6,166,000
Financial Analysis - cost per acre-foot	
Equivalent annual cost	$ 12,006,000
Product Water, acre-feet	25,000
Equivalent annual cost per acre-foot	**$ 480**

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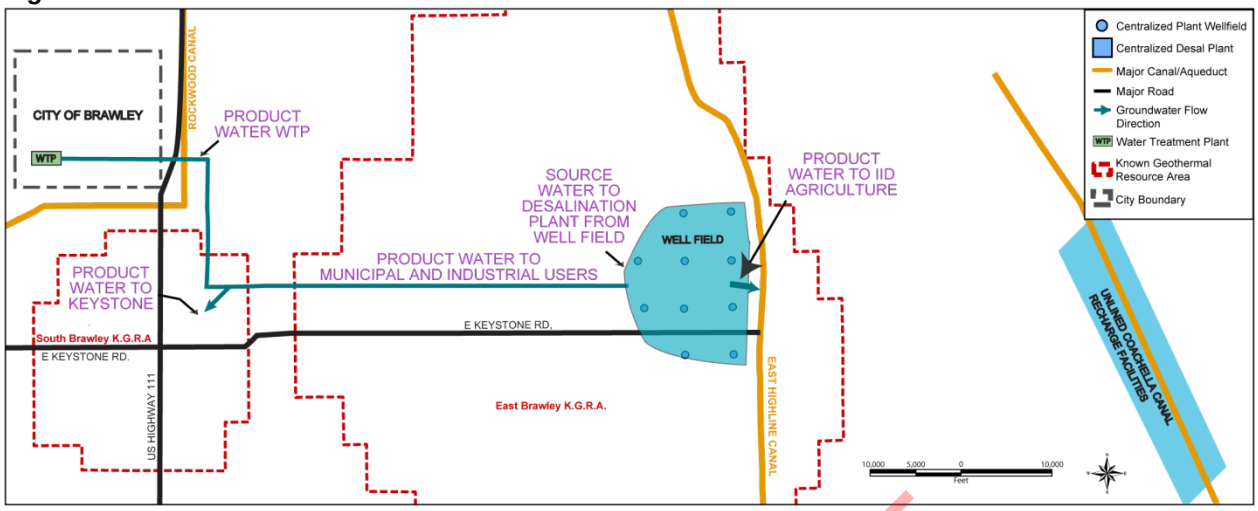
N.1.2.9 Desal Alternative 9 - 25,000 AF East Brawley Desalination with Well Field, Groundwater Recharge and MCI Distribution

Description

The purpose of this alternative is to use all the elements in alternative 8 and add a product water delivery pipeline from East Brawley to the Keystone area and the City of Brawley for municipal and industrial use (Figure N-11). The product water will be delivered through approximately 19 miles of pipeline to the Keystone area and the City of Brawley water treatment plant. This source of water would also provide benefits as a contingency to catastrophic failure of the Coachella Canal and the All American Canal.

The delivery of the product water to the water treatment plants would require further planning to evaluate the quantity of water that can be accepted by the treatment plants and be supplied for municipal and industrial use. The alternative is technically feasible and will be further compared to other alternatives.

Figure N-11. Desal Alternative 9



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Costs

Table N-10. Desal Alternative 9 – 25KAF East Brawley Desalination with Well Field and Groundwater Recharge and MCI Distribution (May 2009 price level, 4% real interest rate, 30 year project life)

Direct Capital Costs, May 2009 Price Level	Total
Desal Plant	42,940,000
Source water development, collection and transmission - well water	33,862,797
Recharge Facilities	417,600
Concentrate Disposal - New Injection Wells	5,400,000
Mitigation Costs (reduced flow from drains)	-
Product Water Distribution	44,440,000
Working capital (2 months of O&M costs per Reclamation, Page D-20)	780,000
Direct Capital Costs, May 2009 Price Level	$ 127,840,397
Indirect Capital Costs (as percent of direct costs UON)	
Freight and Insurance 5 % of direct capital cost	4,430,000
Owner's direct expense, 10 % of direct capital cost	12,780,000
Construction Overhead, 15 % of direct capital cost	13,290,000
Interest During Construction for half of construction period	3,835,212
Indirect Capital Costs (as percent of direct costs UON)	$ 34,335,212
Capital Cost	$ 162,175,609
Annual O&M costs, May 2009 Price Level	$ 7,084,000
Financial Analysis - cost per acre-foot	
Equivalent annual cost	$ 16,463,000
Product Water, acre-feet	25,000
Equivalent annual cost per acre-foot	**$ 659**

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N.1.2.10 Desal Alternative 10 - 5,000 AF East Brawley Desalination with Well Field

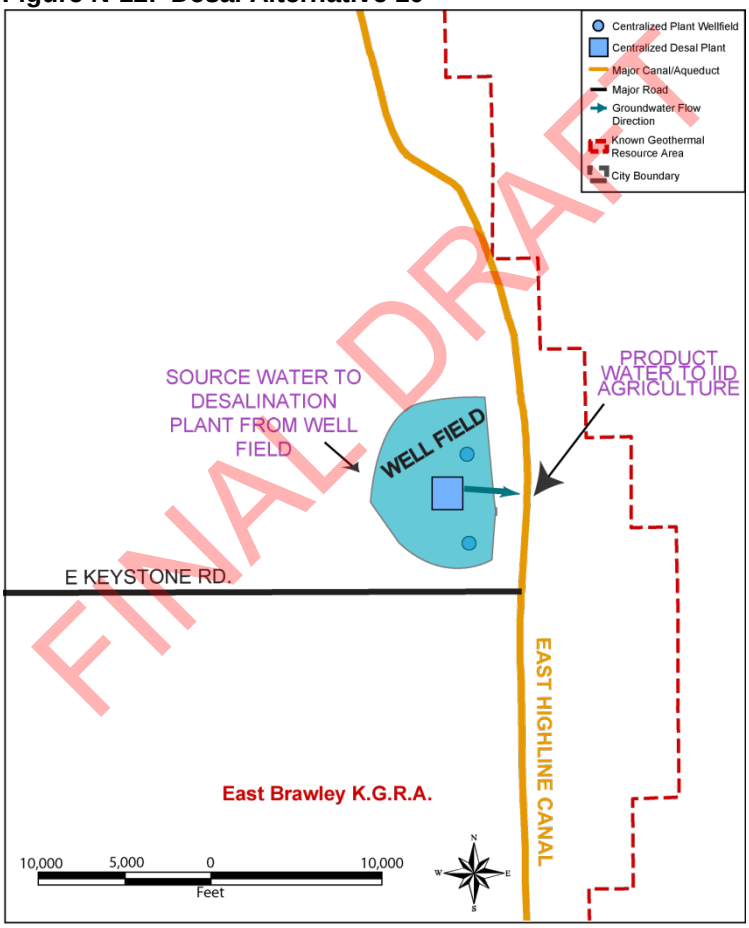
Description

The purpose of this alternative is to determine the feasibility of a 5,000 AFY desalination plant supplied by groundwater located in the East Brawley KGRA (Figure N-12). The exact location has not been determined. The facility was sited to allow for estimation of conveyance costs. The source water would be from a well field located in the East Brawley KGRA and consisting of two wells drilled to an average depth of 900 feet producing 2,000 gpm for a total production capacity of about 4,100 gpm. The wells are connected by pipelines which will convey the water to the plant; would be sited in existing easements and rights-of-way. Total dissolved solids concentration of 1,900 mg/L is assumed. Water temperature from this well configuration is anticipated to be about 170 degrees Fahrenheit. This will necessitate cooling the water prior to treatment to protect membranes and maintain plant efficiency.

The product water would be conveyed to IID facilities for distribution to agricultural uses. Brine disposal will be through injection of the water to the deeper, highly saline formations beneath the plant using one new injection well. If geothermal plants were to be co-located in the future, there could be an opportunity to partner on wells that would recover the hot water and inject the brine stream from the Desalination Plant.

This project would rely solely on groundwater and may result in a groundwater depletion and decline in groundwater level that could lead to migration of poor quality water or land subsidence. Further research of the aquifer characteristics should be conducted to determine the sustainability of using groundwater without mitigation through recharge facilities. The alternative is technically feasible and will be further compared to other alternatives.

Figure N-12. Desal Alternative 10



Costs

Table N-11. Desal Alternative 10 – 5KAF East Brawley Desalination with Well Field (May 2009 price level, 4% real interest rate, 30 year project life)

Direct Capital Costs, May 2009 Price Level		Total
Desal Plant		13,960,000
Source water development, collection and transmission - well water		4,792,448
Recharge Facilities		-
Concentrate Disposal - Using Geothermal Operators Injection Wells		-
Mitigation Costs (reduced flow from drains)		-
Product Water Distribution		388,800
Working capital (2 months of O&M costs per Reclamation, Page D-20)		190,000
Direct Capital Costs, May 2009 Price Level	$	19,331,248
Indirect Capital Costs (as percent of direct costs UON)		
Freight and Insurance 5 % of direct capital cost		730,000
Owner's direct expense, 10 % of direct capital cost		1,930,000
Construction Overhead, 15 % of direct capital cost		2,180,000
Interest During Construction for half of construction period		579,937
Indirect Capital Costs (as percent of direct costs UON)	$	5,419,937
Capital Cost	$	24,751,185
Annual O&M costs, May 2009 Price Level	$	1,525,000
Financial Analysis - cost per acre-foot		
Equivalent annual cost	$	2,956,000
Product Water, acre-feet		5,000
Equivalent annual cost per acre-foot	**$**	**591**

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N.1.2.11 Desal Alternative 11 - 25,000 AF East Mesa Desalination with Well Field

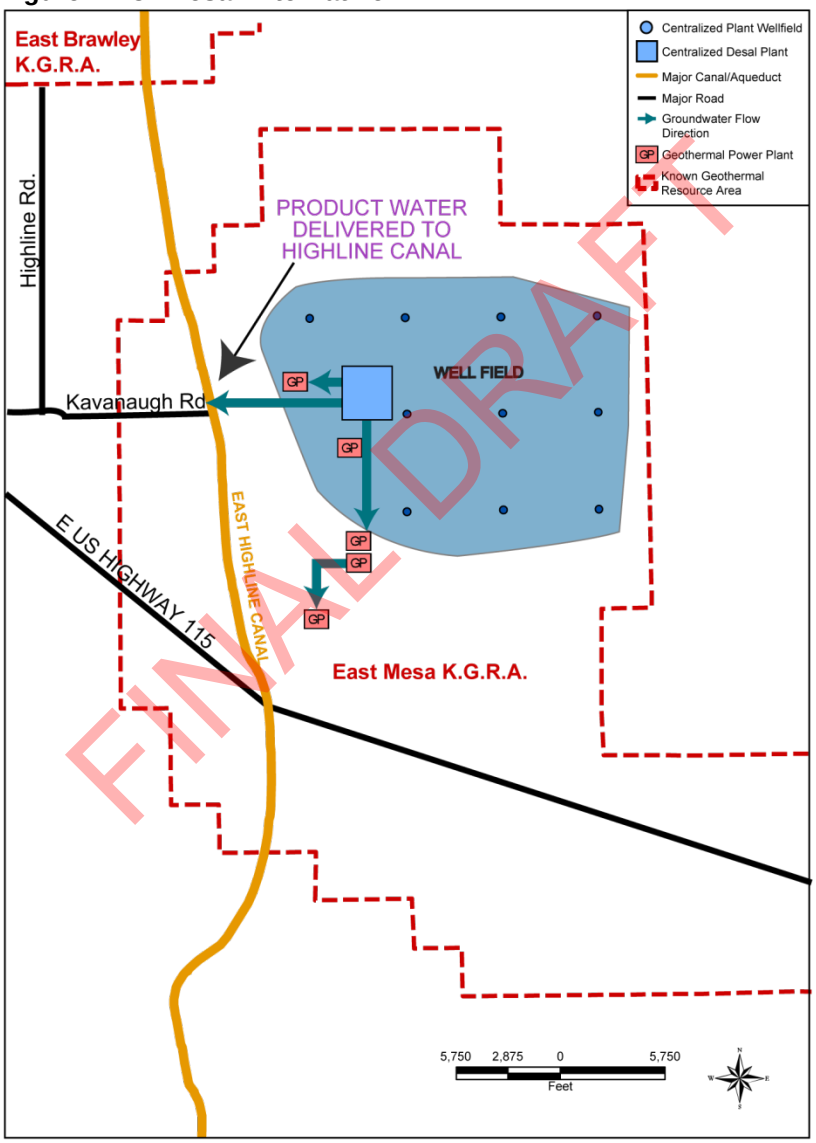
Description

The purpose of this alternative is to determine the feasibility of a 25,000 AFY desalination plant located in the East Mesa KGRA using groundwater without recharge or groundwater banking facilities (Figure N-13). The exact location has not been determined. The facility was sited to allow for estimation of conveyance costs. The source water would be from a well field located in the East Mesa KGRA and consisting of 10 wells drilled to an average depth of 900 feet producing 2,000 gpm for a total production capacity of about 21,000 gpm. The wells are connected by pipelines leading to one-mile long trunk line that will convey the water to the plant; would be sited in existing easements and rights-of-way. Total dissolved solids concentration of 1,900 mg/L is assumed. Water temperature from this well configuration is anticipated to be about 170 degrees Fahrenheit. This will necessitate cooling the water prior to treatment to protect membranes and maintain plant efficiency.

The product water would be conveyed to the geothermal plants and IID facilities for distribution to agricultural uses. Brine disposal will be through injection of the water to the deeper, highly saline formations beneath the plant using three new injection wells. If geothermal plants were to be co-located in the future, there could be an opportunity to partner on wells that would recover the hot water and inject the brine stream from the Desalination Plant.

This project would rely solely on groundwater and would result in large groundwater depletion.

Figure N-13. Desal Alternative 11



Costs

Table N-12. Desal Alternative 11 – 25KAF East Mesa Desalination with Well Field (May 2009 price level, 4% real interest rate, 30 year project life)

Direct Capital Costs, May 2009 Price Level	Total
Desal Plant	42,940,000
Source water development, collection and transmission - well water	27,026,002
Recharge Facilities	-
Concentrate Disposal - New Injection Wells	5,400,000
Mitigation Costs (reduced flow from drains)	-
Product Water Distribution	12,753,600
Working capital (2 months of O&M costs per Reclamation, Page D-20)	780,000
Direct Capital Costs, May 2009 Price Level	$ 88,899,602
Indirect Capital Costs (as percent of direct costs UON)	
Freight and Insurance 5 % of direct capital cost	2,820,000
Owner's direct expense, 10 % of direct capital cost	8,890,000
Construction Overhead, 15 % of direct capital cost	8,470,000
Interest During Construction for half of construction period	2,666,988
Indirect Capital Costs (as percent of direct costs UON)	$ 22,846,988
Capital Cost	$ 111,746,590
Annual O&M costs, May 2009 Price Level	$ 6,327,000
Financial Analysis - cost per acre-foot	
Equivalent annual cost	$ 12,789,000
Product Water, acre-feet	25,000
Equivalent annual cost per acre-foot	**$ 512**

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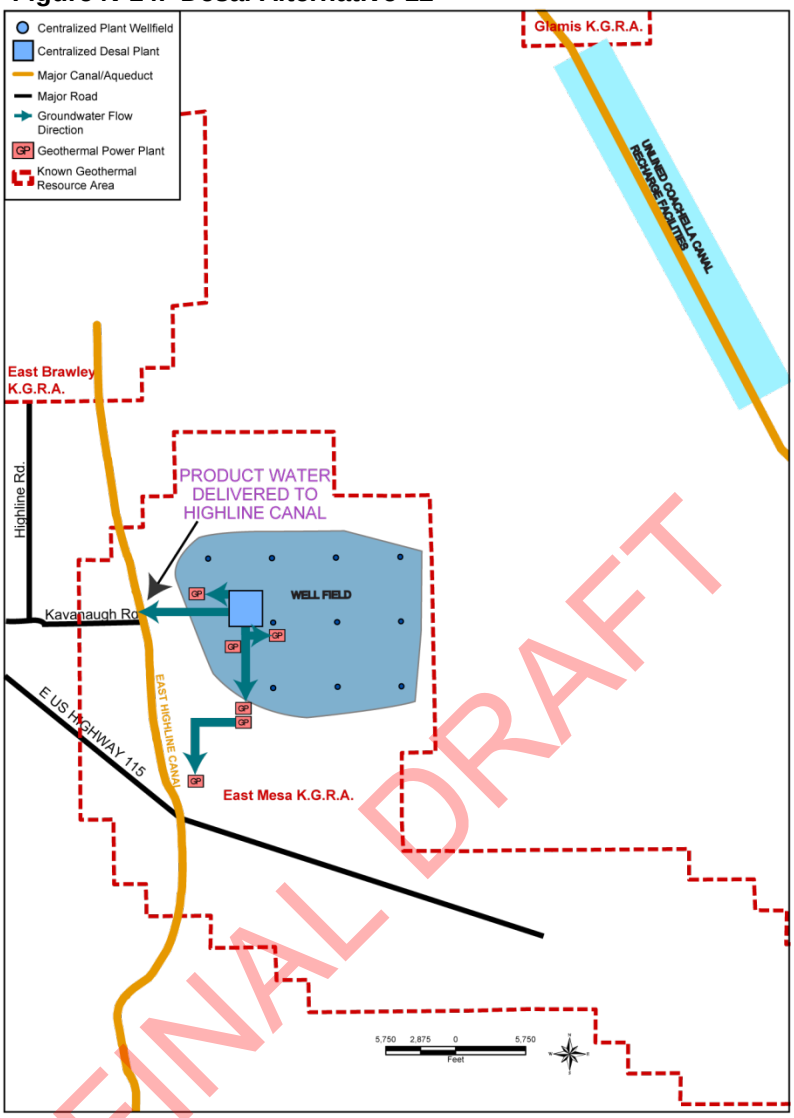
N.1.2.12 Desal Alternative 12 - 25,000 AF East Mesa Desalination with Well Field and Groundwater Recharge

Description

The purpose of this alternative is to utilize the same elements as alternative 11 with the exception that groundwater recharge and banking facilities are included in the East Mesa to minimize the potential negative effects on the groundwater basin and reduce groundwater depletion (Figure N-14). For purpose of the analysis, it was assumed that the old Coachella Canal would be developed to provide for recharge and banking of Colorado River water that is available in years where there is an under-run. The amount of Colorado River water to be banked was assumed to vary from 15,000 AFY to 250,000 AFY. Appendix F describes the potential under-runs that may be available for groundwater recharge and different groundwater banking scenarios.

Figure N-14. Desal Alternative 12



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This project would mitigate for most of the groundwater impacts, but would still result in some groundwater storage depletion of the groundwater basin. The aquifer is currently full and some period of groundwater development may be needed to optimize groundwater recharge operations. IID development, management, and operations of local groundwater recharge facilities have multiple benefits and the feasibility of recharge in the East Mesa merits further review. The alternative is technically feasible and will be further compared to other alternatives.

Variants

East Mesa Recharge Facilities: A variant on this theme would be to develop dedicated groundwater recharge basins in the East Mesa. This would be constrained due to ownership and management by the BLM, the existence of sensitive habitats, and ability to obtain easements and rights-of-way. There could be possibility for land exchange to overcome some of the potential constraints.

Costs

Table N-13. Desal Alternative 12 – 25KAF East Mesa Desalination with Well Field and Groundwater Recharge May 2009 price level, 4% real interest rate, 30 year project life)

Direct Capital Costs, May 2009 Price Level	Total
Desal Plant	42,940,000
Source water development, collection, transmission and recharge - well water	27,046,882
Recharge Facilities	417,600
Concentrate Disposal - New Injection Wells	5,400,000
Mitigation Costs (reduced flow from drains)	-
Product Water Distribution	12,753,600
Working capital (2 months of O&M costs per Reclamation, Page D-20)	780,000
Direct Capital Costs, May 2009 Price Level	$ 89,338,082
Indirect Capital Costs (as percent of direct costs UON)	
Freight and Insurance 5 % of direct capital cost	2,840,000
Owner's direct expense, 10 % of direct capital cost	8,930,000
Construction Overhead, 15 % of direct capital cost	8,530,000
Interest During Construction for half of construction period	2,680,142
Indirect Capital Costs (as percent of direct costs UON)	$ 22,980,142
Capital Cost	$ 112,318,224
Annual O&M costs, May 2009 Price Level	$ 6,336,000
Financial Analysis - cost per acre-foot	
Equivalent annual cost	$ 12,831,000
Product Water, acre-feet	25,000
Equivalent annual cost per acre-foot	**$ 513**

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N.1.2.13 Desal Alternative 13 - 5,000 AF East Mesa Desalination with Well Field

Description

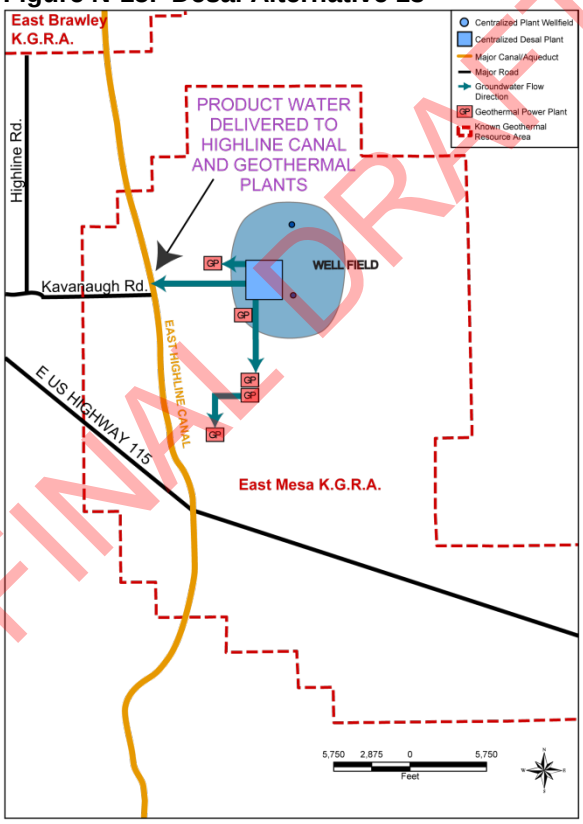
The purpose of this alternative is to reduce the desalination plant from 25,000 AFY to a 5,000 AFY desalination plant located in the East Mesa KGRA and to evaluate and compare small plants if they were to be developed to serve individual geothermal facilities (Figure N-15); for example, if plants were required to develop independent water supplies in lieu of Colorado River Water. The exact location has not been determined. The facility was sited to allow for estimation of conveyance costs. The source water would be from a well field located in the East Mesa KGRA and consisting of two wells drilled to an average depth of 900 feet producing 2,000 gpm for a total production capacity of about 4,100 gpm. The wells are connected by pipelines leading to a one-mile trunk line which will convey the water to a plant. Total dissolved solids concentration of 1,900 mg/L is assumed. Water temperature from this well configuration is

anticipated to be about 170 degrees Fahrenheit. This will necessitate cooling the water prior to treatment to protect membranes and maintain plant efficiency.

The produced water would be conveyed to geothermal plants for industrial use. Brine disposal will be through injection of the water to the deeper, highly saline formations beneath the plant using one new injection well. If geothermal plants were to be co-located in the future, there could be an opportunity to partner on cooling and injection wells that would recover the hot water and inject the brine stream from the desalination plant.

This project would rely solely on groundwater and may result in groundwater depletion and decline in groundwater level which could lead to migration of poor quality water or land subsidence. Further research of the aquifer characteristics should be conducted to determine the sustainability of using groundwater without mitigation through recharge facilities. The alternative is technically feasible and will be further compared to other alternatives.

Figure N-15. Desal Alternative 13



Note: No specific recommendation is made for connecting a specific existing or proposed geothermal plant

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Costs

Table N-14. Desal Alternative 13 – 5KAF East Mesa Desalination with Well Field (May 2009 price level, 4% real interest rate, 30 year project life)

Direct Capital Costs, May 2009 Price Level		Total
Desal Plant		13,960,000
Source water development, collection and transmission - well water		4,976,912
Recharge Facilities		-
Concentrate Disposal - New Injection Wells		1,800,000
Mitigation Costs (reduced flow from drains)		-
Product Water Distribution		4,924,800
Working capital (2 months of O&M costs per Reclamation, Page D-20)		190,000
Direct Capital Cost, May 2009 Price Level	$	25,851,712
Indirect Capital Costs (as percent of direct costs UON)		
Freight and Insurance 5 % of direct capital cost		950,000
Owner's direct expense, 10 % of direct capital cost		2,590,000
Construction Overhead, 15 % of direct capital cost		2,860,000
Interest During Construction for half of construction period		775,551
Indirect Capital Costs (as percent of direct costs UON)	$	7,175,551
Capital Cost	$	33,027,263
Annual O&M costs, May 2009 Price Level	$	1,648,000
Financial Analysis - cost per acre-foot		
Equivalent annual cost	$	3,558,000
Product Water, acre-feet		5,000
Equivalent annual cost per acre-foot	**$**	**712**

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N.1.2.14 Desal Alternative 14 - 50,000 AF South Salton Sea Desalination with Alamo River Water and Industrial Distribution

Description

The purpose of this alternative is to provide 50,000 AFY of water from the Alamo River to the desalination plant located in the South Salton Sea KGRA (Figure N-16). The exact location has not been determined. The facility was sited to allow for estimation of conveyance costs. The source water would be from the Alamo River with an assumed TDS of about 3,000 mg/L. Water temperature from the river or drains is anticipated to be about 75 degrees Fahrenheit, which will not necessitate cooling the water prior to treatment, but would require filtration.

The produced water will be conveyed to geothermal plant operators in the South Salton Sea KGRA for industrial use. Brine disposal will be through injection of the water to the deeper, highly saline formations beneath the plant using five new injection wells. If geothermal plants

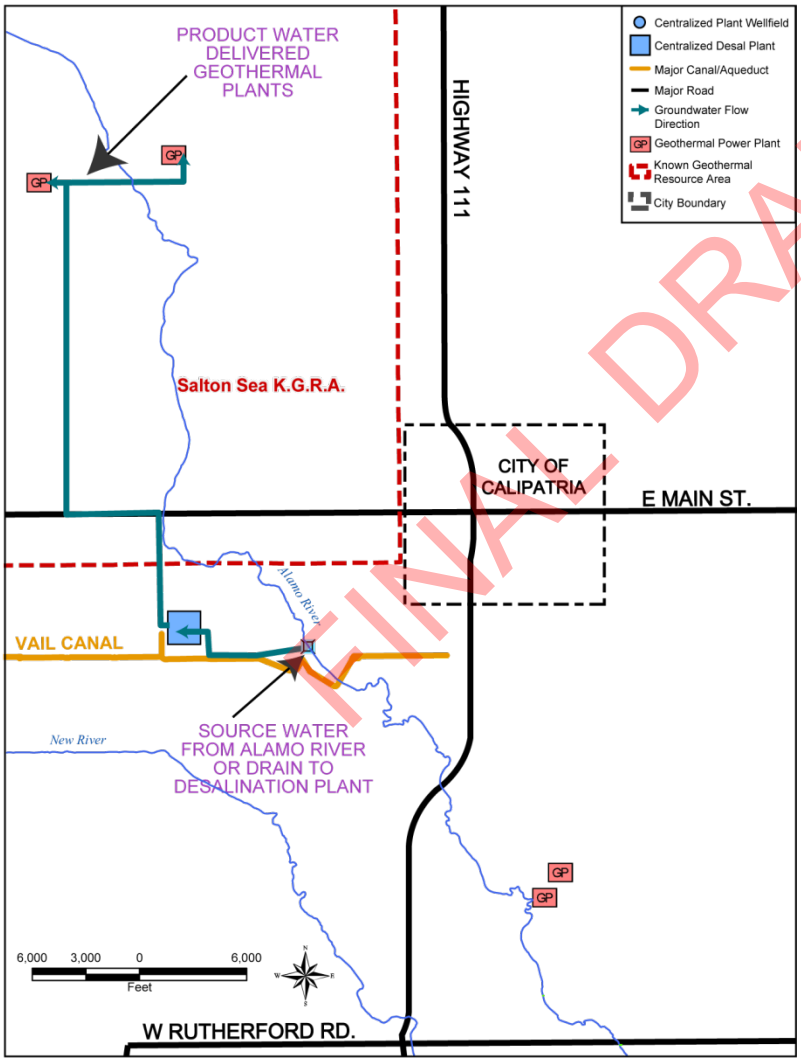
were to be co-located in the future, there could be an opportunity to partner on wells that would recover the hot water and inject the brine stream from the Desalination Plant.

The lack of a well field and recharge facilities will also decrease the capital and operations and maintenance costs. The alternative is technically feasible and will be further compared to other alternatives.

Variants

Drain Water. A variant on this alternative would be the use of source water collected from IID drains instead of the Alamo River. Further research would be needed to determine if the Alamo River or the IID drains are the best source for the desalination plant.

Figure N-16. Desal Alternative 14



Salton Sea Salt Disposal Ponds. A variant on the evaporation basins would be to create evaporation basins in conjuncture with the Salton Sea Restoration plan. The brine could be disposed in borrow pits that may be created during the restoration process. This variant will require further research to determine its feasibility and practicality. Figure N-1 illustrates the anticipated quantity of salt generated as a function of volume brine stream. It is expected that 35 acres of land will be required per 1 MGD of capacity. The dried salts will need to be disposed off-site and further research needs to be conducted to determine the feasibility of this variant.

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Costs

Table N-15. Desal Alternative 14 – 50KAF South Salton Sea Desalination with Alamo River Water and Industrial Distribution (May 2009 price level, 4% real interest rate, 30 year project life)

Direct Capital Costs, May 2009 Price Level	Total
Desal Plant	89,560,000
Source water development and transmission - surface water collection	9,414,240
Recharge Facilities	-
Concentrate Disposal - New Injection Wells	9,000,000
Mitigation Costs (reduced flow from drains)	9,980,391
Product Water Distribution	2,073,600
Working capital (2 months of O&M costs per Reclamation, Page D-20)	2,010,000
Direct Capital Costs, May 2009 Price Level	$ 122,038,231
Indirect Capital Costs (as percent of direct costs UON)	
Freight and Insurance 5 % of direct capital cost	5,180,000
Owner's direct expense, 10 % of direct capital cost	12,200,000
Construction Overhead, 15 % of direct capital cost	15,540,000
Interest During Construction for half of construction period	3,661,147
Indirect Capital Costs (as percent of direct costs UON)	$ 36,581,147
Capital Cost	$ 158,619,378
Annual O&M costs, May 2009 Price Level	$ 15,491,901
Financial Analysis - cost per acre-foot	
Equivalent annual cost	$ 24,664,901
Product Water, acre-feet	50,000
Equivalent annual cost per acre-foot	**$ 493**

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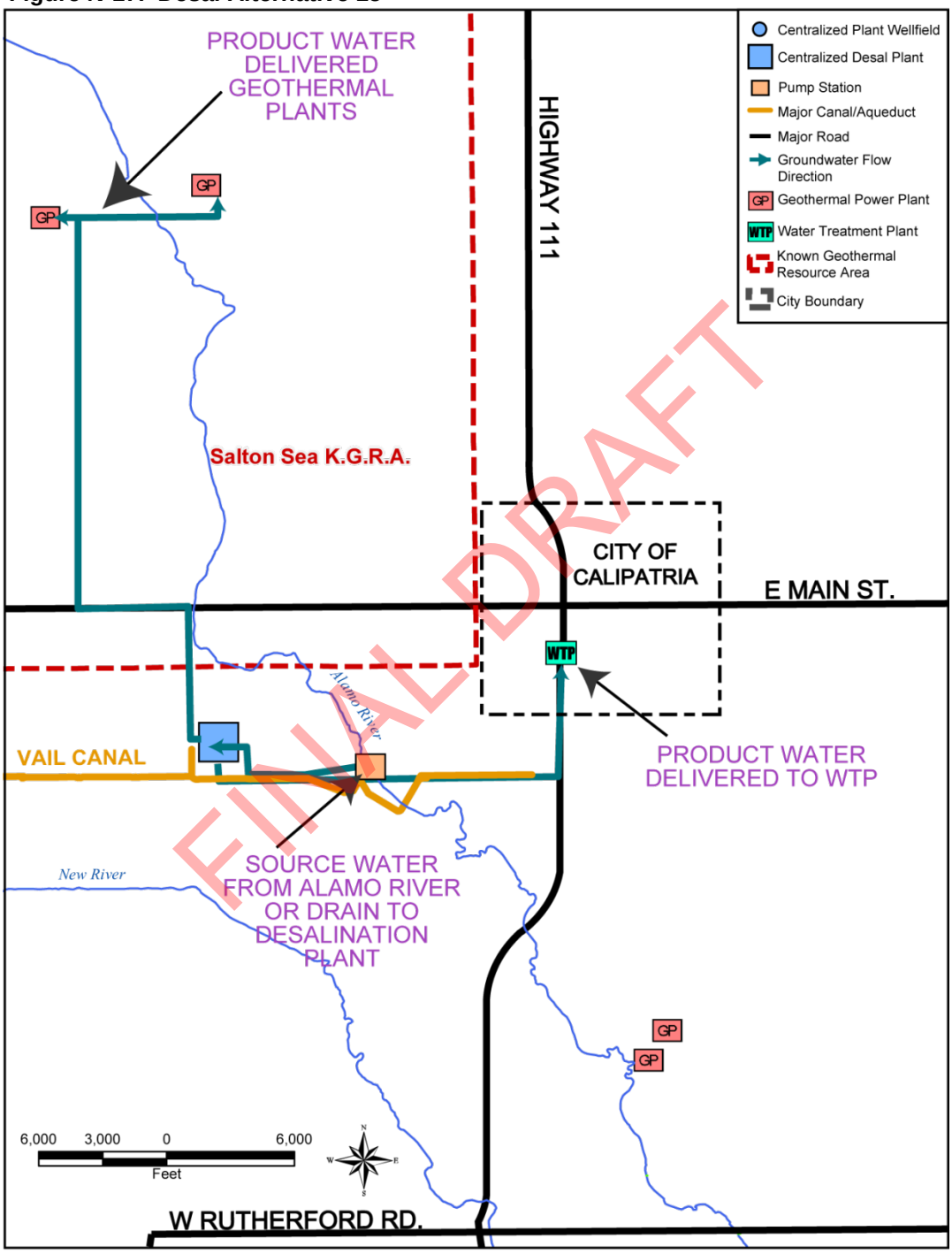
N.1.2.15 Desal Alternative 15 - 50,000 AF South Salton Sea Desalination with Alamo River Water and MCI Distribution

Description

The purpose of this alternative is to use the same elements presented in alternative 14 and add distribution to the Calipatria water treatment plant for municipal use (Figure N-17). The alternative is technically feasible and will be further compared to other alternatives.

A variant on this alternative would be the use of source water collected from IID drains instead of the Alamo River. Further research would be needed to determine if the Alamo River or the IID drains are the best source for the desalination plant.

Figure N-17. Desal Alternative 15



Costs

Table N-16. Desal Alternative 15 – 50KAF South Salton Sea Desalination with Alamo River Water and MCI Distribution (May 2009 price level, 4% real interest rate, 30 year project life)

Direct Capital Costs, May 2009 Price Level	Total
Desal Plant	89,560,000
Source water development and transmission - surface water collection	10,292,000
Recharge Facilities	-
Concentrate Disposal - New Injection Wells	9,000,000
Mitigation Costs (reduced flow from drains)	9,980,391
Product Water Distribution	19,628,800
Working capital (2 months of O&M costs per Reclamation, Page D-20)	2,010,000
Direct Capital Costs, May 2009 Price Level	$ 140,471,191
Indirect Capital Costs (as percent of direct costs UON)	
Freight and Insurance 5 % of direct capital cost	6,060,000
Owner's direct expense, 10 % of direct capital cost	14,050,000
Construction Overhead, 15 % of direct capital cost	18,180,000
Interest During Construction for half of construction period	4,214,136
Indirect Capital Costs (as percent of direct costs UON)	$ 42,504,136
Capital Cost	$ 182,975,327
Annual O&M costs, May 2009 Price Level	$ 15,857,901
Financial Analysis - cost per acre-foot	
Equivalent annual cost	$ 26,438,901
Product Water, acre-feet	50,000
Equivalent annual cost per acre-foot	**$ 529**

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N.1.2.16 Desal Alternative 16 - 5,000 AF South Salton Sea – East Desalination with Well Field

Description

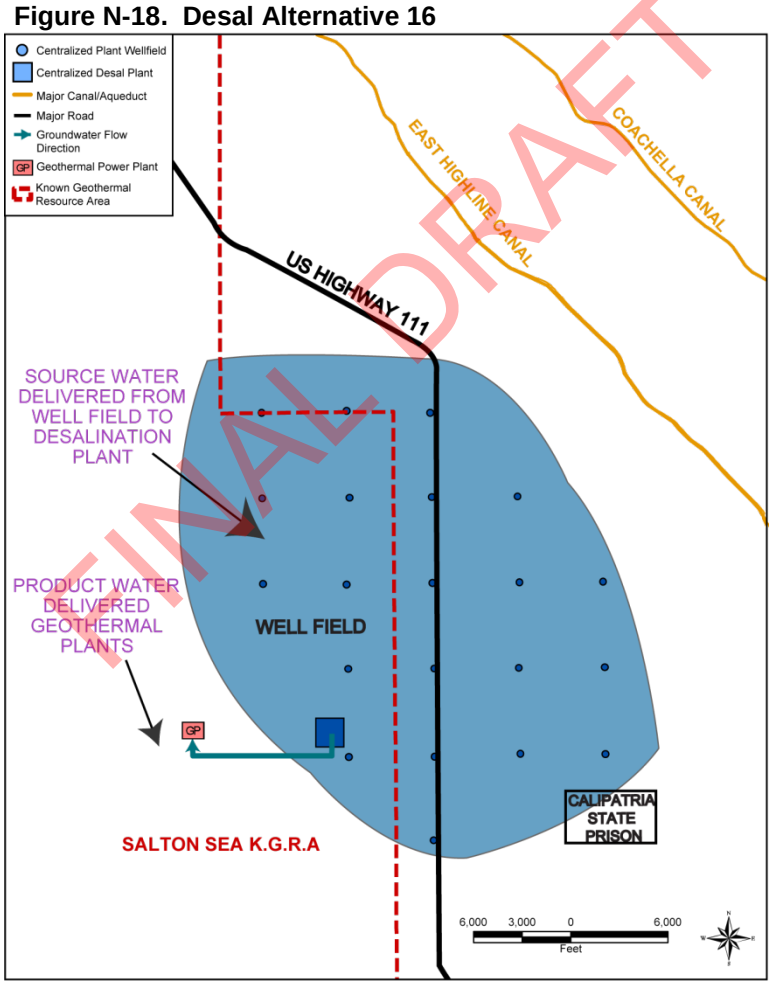
The purpose of this alternative is to provide a 5,000 AFY desalination plant located in the East Side of the South Salton Sea KGRA for industrial use (Figure N-18). The exact location has not been determined. The facility was sited to allow for estimation of conveyance costs. This alternative would also allow for comparison of smaller plants if such plants were to be developed to serve the water needs of individual geothermal plants. The source water would be from a well field located in the East Side of the South Salton Sea KGRA in the shallow aquifer and consisting of 21 wells drilled to an average depth of 300 feet producing 200 gpm for a total production capacity of about 4,100 gpm. The wells are connected by pipelines leading the water to the plant; would be sited in existing easements and rights-of-way. Total dissolved solids concentration of 1,500 mg/L is assumed. Water temperature from this well configuration is

anticipated to be about 94 degrees Fahrenheit. This may necessitate cooling the water prior to treatment to protect membranes and maintain plant efficiency.

The produced water would be conveyed to geothermal plants for industrial use. Brine disposal will be through injection of the water to the deeper, highly saline formations beneath the plant using one new injection well. If geothermal plants were to be co-located in the future, there could be an opportunity to partner on wells that would recover the hot water and inject the brine stream from the Desalination Plant.

This project would rely solely on groundwater and may result in groundwater depletion. Further research of the aquifer characteristics should be conducted to determine the sustainability of using groundwater without mitigation through recharge facilities. The alternative is technically feasible and will be further compared to other alternatives.

Figure N-18. Desal Alternative 16



Costs

Table N-17. Desal Alternative 16 – 5KAF South Salton Sea – East Desalination with Well Field (May 2009 price level, 4% real interest rate, 30 year project life)

Direct Capital Costs, May 2009 Price Level		Total
Desal Plant		12,260,000
Source water development, collection and transmission - well water		34,489,425
Recharge Facilities		-
Concentrate Disposal - New Injection Wells		1,800,000
Mitigation Costs (reduced flow from drains)		-
Product Water Distribution		3,481,600
Working capital (2 months of O&M costs per Reclamation, Page D-20)		170,000
Direct Capital Costs, May 2009 Price Level	$	52,201,025
Indirect Capital Costs (as percent of direct costs UON)		
Freight and Insurance 5 % of direct capital cost		800,000
Owner's direct expense, 10 % of direct capital cost		5,220,000
Construction Overhead, 15 % of direct capital cost		2,390,000
Interest During Construction for half of construction period		1,566,031
Indirect Capital Costs (as percent of direct costs UON)	$	9,976,031
Capital Cost	$	62,177,056
Annual O&M costs, May 2009 Price Level	$	1,971,000
Financial Analysis - cost per acre-foot		
Equivalent annual cost	$	5,567,000
Product Water, acre-feet		5,000
Equivalent annual cost per acre-foot	**$**	**1,113**

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N.1.2.17 Desal Alternative 17 - 5,000 AF Heber Desalination with Well Field

Description

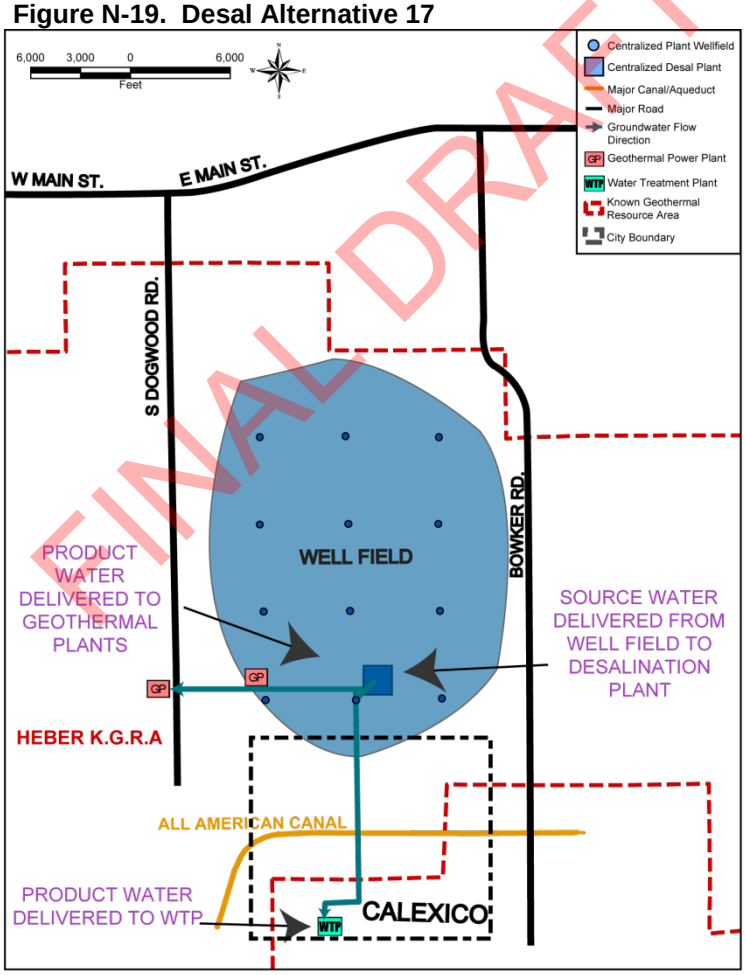
The purpose of this alternative is to provide a 5,000 AFY desalination plant located in the Heber KGRA using groundwater and not using groundwater recharge or banking (Figure N-19). The exact location has not been determined. The facility was sited to allow for estimation of conveyance costs and to allow conveyance of product water to be used by geothermal plants in this area. The source water would be from a well field located in the Heber KGRA and consisting of two wells drilled to an average depth of 1,500 feet producing 350 gpm for a total production capacity of about 4,100 gpm. The wells are connected by pipelines leading to the plant; would be sited in existing easements and rights-of-way. Total dissolved solids concentration of 1,500 mg/L is assumed. Water temperature from this well configuration is

anticipated to be about 300 degrees Fahrenheit. This will necessitate cooling the water prior to treatment to protect membranes and maintain plant efficiency.

The product water would be conveyed to the Calexico water treatment plant for municipal distribution and also conveyed to geothermal operators for industrial use. Brine disposal will be through injection of the water to the deeper, highly saline formations beneath the plant using injection wells currently in operation by the geothermal purveyors. If geothermal plants were to be co-located in the future, there could be an opportunity to partner on wells that would recover the hot water and inject the brine stream from the Desalination Plant.

This project would rely solely on groundwater and may result in further groundwater depletion. Further investigation on aquifer characteristics should be conducted to determine the sustainability of using groundwater. The alternative is technically feasible and will be further compared to other alternatives.

Figure N-19. Desal Alternative 17



Costs

Table N-18. Desal Alternative 17 – 5KAF Heber Desalination with Well Field (May 2009 price level, 4% real interest rate, 30 year project life)

Direct Capital Costs, May 2009 Price Level	Total
Desal Plant	11,750,000
Source water development, collection and transmission - well water	63,103,716
Recharge Facilities	-
Concentrate Disposal - Using Geothermal Operators Injection Wells	Not Included
Mitigation Costs (reduced flow from drains)	-
Product Water Distribution	5,577,600
Working capital (2 months of O&M costs per Reclamation, Page D-20)	170,000
Direct Capital Costs, May 2009 Price Level	$ 81,601,316
Indirect Capital Costs (as percent of direct costs UON)	
Freight and Insurance 5 % of direct capital cost	920,000
Owner's direct expense, 10 % of direct capital cost	8,160,000
Construction Overhead, 15 % of direct capital cost	2,770,000
Interest During Construction for half of construction period	2,448,039
Indirect Capital Costs (as percent of direct costs UON)	$ 14,298,039
Capital Cost	$ 95,899,356
Annual O&M costs, May 2009 Price Level	$ 2,476,000
Financial Analysis - cost per acre-foot	
Equivalent annual cost	$ 3,303,000
Product Water, acre-feet	5,000
Equivalent annual cost per acre-foot	**$ 661**

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N.1.2.18 Groundwater Blending Alternative 18 - 25,000 AF East Mesa with Well Field pumping to All-American Canal

Description

The purpose of this alternative is to utilize groundwater in the East Mesa area based on proximity of the well field to the All-American Canal (AAC). It is estimated that 35 cfs (25,000 AFY) of groundwater will be produced with a TDS of between 1,500 and 3,000 mg/L. The groundwater will be pumped into the AAC and would be blended to have a resultant TDS of about 780 mg/L assuming median flows of 3,975 cfs and a canal water TDS of 753 mg/L with groundwater TDS of 3,000 mg/L. Please see Figure 2 in Appendix M for the resultant water quality with the All-American Canal with respect to groundwater pumping flow.

The designed supply of 25,000 AFY for the well field may not be the actual yield of water that can be supplied for irrigation. Depending on the TDS of the groundwater the resultant TDS in the canal may approach a level that will require over irrigation of the land to compensate for a

higher TDS. If the TDS of the groundwater were 2,000 mg/L the net increase of the water supply with 25,000 acre-feet pumped would be about 17,000 acre-feet. A groundwater TDS of 3,000 mg/L with 25,000 acre-feet pumped would result in an actual net supply of 10,000 acre-feet (Davids Engineering, Inc., 2009). To determine the actual TDS of the groundwater in the location chosen for a well field a pumping test should be performed to determine the aquifer characteristics and water quality samples should be collected during the pumping and analyzed for TDS. This analysis will allow a greater understanding of the final blended TDS that will be supplied for irrigation.

Recharge and banking facilities are not included in the East Mesa to mitigate for the groundwater pumping. This project would not mitigate for the groundwater impacts and would result in some groundwater storage depletion from groundwater basin.

The alternative is technically feasible and will be further compared to other alternatives.

Costs

Table N-18 a. Groundwater Blending Alternative 18 – 25KAF East Mesa with Well Field pumping to All-American Canal (May 2009 price level, 4% real interest rate, 30 year project life)

Direct Capital Costs, May 2009 Price Level	Total
Source water development, collection and transmission - well water	24,599,532
Highway and Canal Crossings (allowance)	360,000
Electric Power Installed - Well Field	8,000,000
Product Water Distribution	24,000
Land Costs for 640 acres	416,000
Direct Capital Costs, May 2009 Price Level	$ 33,399,532
Indirect Capital Costs (as percent of direct costs UON)	
Freight and Insurance 5 % of direct capital cost	440,000
Owner's direct expense, 10 % of direct capital cost	3,340,000
Construction Overhead, 15 % of direct capital cost	1,320,000
Interest During Construction for half of construction period	1,001,986
Indirect Capital Costs (as percent of direct costs UON)	$ 6,101,986
Capital Cost	$ 39,501,517
Annual O&M costs, May 2009 Price Level	$ 198,000
Financial Analysis - cost per acre-foot	
Equivalent annual cost	$ 2,482,000
Product Water, acre-feet	25,000
Equivalent annual cost per acre-foot	**$ 99**

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N.1.2.19 Groundwater Blending Alternative 19 - 25,000 AF East Mesa with Well Field pumping to All-American Canal – With Percolation Basins Supplied by Coachella Canal

Description

The purpose of this alternative is to add 200 acres of percolation basins to alternative to mitigate for the production of 25,000 AFY. The source of water for groundwater banking is from under-run years. The recharge water will be supplied by a turnout from the Coachella Canal and the recharge quantity will be approximately 30,000 acre-feet during years of overrun and assuming a 5,000 acre-feet loss of the percolated water about 25,000 acre-feet will be banked.

The total amount of water that can be percolated through the percolation basins will be able to exceed the take amount of 25,000 AFY from the aquifer. During years of overrun up to 60,000 AFY of lower TDS canal water could be percolated and may result in the lowering of the TDS within the aquifer in the East Mesa. This lowering of TDS may allow for better quality groundwater to be produced by the wells in years of under-run which would result in a greater actual yield of water that can be supplied for irrigation.

Further review and refinement of this alternative will be based on the evaluation of actual field conditions. Viable properties in the East Mesa will need to be located and negotiations with BLM will be necessary to secure the easements and rights of way for the well sites and the percolation basins. Due to these uncertainties a 30-percent contingency has been added to the source water development, collection and transmission line item for the project costs as well as to the acquisition price of the land.

The alternative is technically feasible and will be further compared to other alternatives.

Variants

Instead of using the Coachella Canal to supply the percolation basins the All American Canal could be used. Depending on the quality of the source water a SCADA system could be installed to monitor a reservoir that would be used to pre-blend the water for the canal. This type of monitoring would allow better management of the TDS during periods of low flow in the canal.

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Costs

Table N-18 b. Groundwater Blending Alternative 19 – 25KAF East Mesa with Well Field pumping to All-American Canal – With Percolation Basins Supplied by Coachella Canal (May 2009 price level, 4% real interest rate, 30 year project life)

Direct Capital Costs		Total
Source water development, collection and transmission - well water	$	26,725,187
Highway and Canal Crossings (allowance)		360,000
Electric Power Installed - Well Field		8,000,000
Product Water Distribution		24,000
Land Costs for 640 acres		416,000
Percolation Basins		5,033,600
Working capital (2 months of O&M costs per Reclamation, Page D-20)		-
Direct Capital Costs, May 2009 Price Level	$	40,558,787
Indirect Capital Costs (as percent of direct costs UON)		
Freight and Insurance 5 % of direct capital cost		690,000
Owner's direct expense, 10 % of direct capital cost		4,060,000
Construction Overhead, 15 % of direct capital cost		2,080,000
Interest During Construction for half of construction period		1,216,764
Indirect Capital Costs (as percent of direct costs UON)	$	8,046,764
Capital Cost	$	48,605,551
Annual O&M costs, May 2009 Price Level	$	243,000
Financial Analysis - cost per acre-foot		
Equivalent annual cost	$	3,054,000
Product Water, acre-feet		25,000
Equivalent annual cost per acre-foot	**$**	**122**

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N.1.2.20 Next Steps/Additional Information Required

This investigation has been done at a concept level based on available information. Decisions to eliminate these alternatives should consider the following assumptions. If these alternatives are further evaluated, additional examination of these limitations should be made.

- Further field work and original data collection should be conducted to determine if pumping of groundwater will result in unacceptable levels of groundwater depletion and have potentially negative effects on the aquifers beneath the different KGRAs. A test well should be drilled, water quality samples obtained, and an aquifer test should be conducted to assess the aquifer characteristics for each potential well field location. A temperature log should be completed on each test borehole to determine if the water

temperature for the source water requires cooling prior to desalination. TDS levels and the levels of specific ions should be established.

- If these alternatives pass additional screening further feasibility studies of recharge in the East Mesa should be conducted, including meeting with the BLM; scoping further field and pre-design studies; evaluating input; and taking operational scenarios (alternatives 2, 5, 8, and 12).

- Determine the quantity of water municipalities and geothermal plant operators can use for alternatives 3, 9, and 13. Also, determine the appropriate water quality parameters for the finished water.

- Determine the point-of-take for source water, whether the Alamo River or the drains for alternative 4, 15, and 16. The river diversion or drain diversion will need to be engineered and an analysis performed to determine the most efficient method of providing the source water.

- Research the potential to use borrow pits created from the Salton Sea restoration for evaporation ponds and phasing projects to be sequenced with efforts to restore the Salton Sea. Using Figure N-1, it is expected that 35 acres of land will be required per 1 MGD of capacity.

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N.2 Banking of Inadvertent Under-runs

N.2.1 Purpose and Design Considerations

Imperial Irrigation District (IID) has a fixed annual consumptive use allocation from the Colorado River based on the Quantification Settlement Agreement (QSA) and the United States Bureau of Reclamation (USBR) Colorado River Decree accounting. Most of IID's demands are based on agricultural irrigation which tends to vary from year to year.

On an annual basis this results in overruns (diversions in excess of consumptive use right) or under-runs (diversions that are less than consumptive use rights). These inadvertent overruns must be paid back by extraordinary water conservation in future years. Under- runs are lost every year and do not carry over unless there is groundwater storage space that can be used. USBR has developed the Inadvertent Overrun and Payback Policy (IOPP) that provides accounting for overruns and manner of payback.

Surface water is typically stored underground by spreading the water in shallow basins overlying an aquifer which has capacity to absorb the water and which will keep the water where it can later be recovered by pumping. The soil between the shallow basins and the aquifer must allow the water to flow through to the aquifer. Layers of clay or fault lines may prevent the water from reaching the aquifer. As the stored water will blend with the water already in the aquifer, the quality of both water supplies must meet a variety of water quality standards. Resultant water quality will be a mix of the two water types.

The physical characteristics of the aquifer must be such that the stored water will be retained within the aquifer and available for recovery when needed. Adequate wells and conveyance are needed for the recovery.

Establishing a viable water banking program – especially if the program is physically located outside the district whose water is being stored – requires developing a number of contractual agreements and institutional relationships. These may address use of facilities for conveying the water, ownership of the water while in storage, use of facilities to recover the water, and limitations on the recovery of the water to protect other users of the aquifer.

Practical solutions for challenges created by the seasonal availability of water for storage, water quality issues, costs of conveyance, and seasonal demand for water may involve exchanges of water between water agencies. These exchanges also create development of contractual agreements and institutional relationships.

N.2.2 Project Alternative - Water Banking Alternative 1 – Coachella Valley Groundwater Storage Project The proposed project is based on a preliminary memorandum provided by Imperial Irrigation District.

Description

Water Banking Alternative 1 proposes storing inadvertent overruns by them via the Coachella Canal to spreading grounds located in the East Coachella Valley. Recovery of the water would be accomplished by exchange. Agricultural users overlying the aquifer where the water was stored would pump the water for their use. IID would receive their Colorado River entitlement in exchange.

The physical facilities would consist of a canal turnout and pump station, 5 miles of power transmission lines and a 500-acre spreading grounds. The spreading grounds would include a stilling basin for desilting and clarification, a geo-biologic treatment basin, and a series of tiered spreading basins covering 292 acres. Maximum recharge capacity is estimated at slightly over 100,000 acres per year (150 cfs).

The anticipated yield of this alternative varies depending on a variety of assumptions including, the management of overruns, available initial storage, aquifer losses and total storage capacity. Based on an analyses prepared by Natural Resources Consulting Engineers (NRCE 2009), the yield may vary between 19,000 AFY and 55,000 AFY. For purposes of this analysis, a yield of 50,000 AFY has been used.

Implementation is anticipated to require on the order of 5 to 8 years. Preliminary planning efforts (studies, land acquisition, negotiations, draft environmental) are anticipated to require 1.5 to 2 years); completion of environmental documentation and approvals, another 2.25 to 3 years; design and bidding, 1.5 to 2 years; and construction would take 1 to 1.5 years.

Cost

The capital cost of Water Banking Alternative 1 is $ 99.2 million. The alternative would deliver 50,000 AFY at a cost of approximately $ 266 per acre foot. Table N-19 presents the cost of developing this alternative.

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Table N-19. Water Banking Alternative 1 IID East Coachella Valley Recharge/Storage

(May 2009 price level, 4% real interest rate, 30 year project life)

Capital Cost		
Design	$	7,950,000
Ground Acquisition/Grading and Construction		81,000,000
Offsite Infrastructure		1,250,000
Contingency		9,000,000
Capital Cost	$	99,200,000
O&M Cost		
Recharge facility O&M Costs	$	2,916,000
Annual Land Lease		128,000
Wheeling-Water Delivery to Site [1]		1,500,000
Energy Cost for Withdrawal Pumping [2]		3,000,000
Total O&M Costs	$	7,544,000
Financial Analysis (4%, 30 years)		
Equivalent Annual Capital Cost		$5,736,746
O&M		7,544,000
Equivalent Annual Cost		$13,280,746
Yield (AFY)		50,000
Equivalent Annual Cost per acre-foot		$266

Notes

[1] Subject to negotiations with land owner.

[2] Subject to negotiation with Coachella Valley Water District

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N.3 Recycling of Municipal Wastewater

N.3.1 Purpose and Design Considerations

The purpose of this section is to evaluate opportunities to recycle municipal wastewater. It investigates a broad range of concepts for recycling ranging from irrigation of crops with secondary treatment, to municipal and industrial use with tertiary treatment. Each alternative includes treatment costs, distribution system costs, and an analysis of potential customers. Four existing plants (Brawley, El Centro, Calexico, and Imperial) and a proposed regional plant are investigated. The cost of additional treatment processes at existing plants and the cost of the proposed regional plants are based on an EPA study (EPA 2001). The alternatives address two different concepts for use: either direct delivery to specific customers or delivery to the IID distribution system where it would be blended with Colorado River water.

Figure N-20 shows the locations of existing wastewater treatment plants and of the proposed regional plant.

Figure N-20. Overview of Wastewater Treatment Plants in IID

N.3.1.1 Availability of and use of wastewater treatment plant effluent

Effluent from the publicly owned wastewater treatment plants is currently discharged to surface drainage, either IID drains or the Alamo or New Rivers. None of it is recycled. Briefly, the cost of water from IID has been so low, and the supply so reliable, that it has been clear to the wastewater agencies that recycling plant effluent would be far more expensive than use of water purchased from IID. But, discussions have started between wastewater plant operators and potential industrial customers.

Additionally, implementing any recycled water programs has been limited due to the concerns about removing inflows from the Salton Sea. Treated wastewater from facilities within IID ultimately discharges to the Salton Sea. The flows help support habitats on the New and Alamos Rivers. The Salton Sea depends on such inflows for several reasons. The inflows help to reduce the effect of evaporation, which causes the salinity levels in the sea to concentrate by providing a constant source of new water. The Sea also serves as a critical link to the Pacific Flyway for bird migration. Also, due to the QSA transfer agreements, flows into the Salton Sea will be reduced. Further reduction could occur because the flows from Mexico may be diminished as Mexicali implements their own reclaimed water program.[1]

State law says that: "The owner of a waste water treatment plant operated, for the purpose of treating wastes from a sanitary sewer system, holds the exclusive right to the treated waste water as against anyone who has supplied the water discharged into the waste water collection and treatment system, including a person using water under a water service contract, unless otherwise provided by agreement."[2] This implies that unless IID has a contract with any of the entities treating and disposing of wastewater that stipulates otherwise, that the wastewater entity has the exclusive right to treat, sell and convey the water to other entities. The wastewater treatment entity needs approval from the RWQCB to ensure consistency with the Water Quality Control Plan and that the new uses of water have appropriate permits or waste discharge requirements.

The approval of the SWRCB would also be required prior to making any change in the point of discharge, place of use, or purpose of use of treated wastewater since all of the wastewater treatment plants currently operate under NPDES permits and discharge wastewater to either the New or Alamo Rivers or IID drains, and reuse of treated wastewater would likely diminish flows to these watercourses. It is not believed that there are any existing water rights or diverters that would be affected or have claim to wastewater flows, but there could be public trust issues and any impacts and effects from any change in use and recycling would need to be evaluated pursuant to CEQA. If impacts are identified as result of the proposed reuse of wastewater, these would need to be mitigated. Without further analysis it cannot be determined what such impacts and mitigation costs may be. The local lead agency proposing the projects would need scope the analysis to consider the effects in such a way that the analysis would support the RWQCB and SWRCB when they make their determination as responsible agencies. IID does not currently have requirements, policies, or permitting standards related to reuse of wastewater within the IID boundaries.

Table N-20 reviews the wastewater plants within the IID service area. Following that table is a more in-depth review of the largest wastewater plant and the plans of their operators.

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[1] Salton Sea Authority Plan for Multi-Purpose Project July 2006 Draft for Board Review
[2] Water Code, Division 2, Part 2, Chapter 1, Article 1.5, 1210-1212

Table N-20. Wastewater Treatment Plants, Imperial County

Discharge sources	Current Conditions				Anticipated Capital Improvements
	Plant Capacity [AFY]	Average Flow [AFY]	Treatment Level	Discharge to (Discharge point/End of Drainage Path)	
City of Brawley WWTP	6,608 (5.9 MGD) [1]	4,481 (4.0 MGD) [1]	Secondary (with impending improvements) [1]	New River [+] / Salton Sea	$25 to $30 million within next three years. Improvements will provide Secondary treatment. [1]
City of Calexico Municipal WWTP	4,816 (4.3 MGD) [2]	3,024 to 3,249 (2.7 to 2.9 MGD) [2]	Secondary with disinfection	New River / Salton Sea [+]	Current plant is 40 years old. Have completed designs for an 8.5 MGD, advanced secondary plant. Economy has stopped the project. Project may be re-scoped. Will take 2 to 3 years to construct. [2]
Calipatria WWTP	1,938 (1.73 MGD) [1]	840 (0.75 MGD) [1]	Primary [1]	"G" Drain / Alamo River [+] (to Salton Sea)	Starting preliminary plans to upgrade to secondary treatment. Capacity is adequate – the prison is the main source of flow and it has significantly reduced flows. [1]
El Centro Municipal WWTP	8,960 (8 MGD) [3]	4,033 (3.6 MGD) [3]	Secondary with disinfection [3]	Central Main Drain / Salton Sea via Alamo River [+]	Repairs to collection systems are anticipated over next five years. Little work to the plant. [3]
Gateway of the Americas WWTP	224 (0.2 MGD) [4]	205 (0.18 MGD) [^]	Secondary with disinfection [4]		No active plans. Ultimate plant intended as 1.5 MGD with daily flows of 1.0 to 1.1 MGD. [4]
Heber PUD WWTP	907 (0.81 MGD) [5]	560 (0.5 MGD) [5]	Primary [5]		Completed design for an upgrade to 1.2 MGD and secondary treatment at a cost of $12.5 million. Project is unfunded. [5]
City of Holtville Municipal WWTP	952 (0.85 MGD) [6]	672 to 728 (0.6 to 0.65 MGD) [6]	Secondary with disinfection [6]	Pear Drain/Alamo River[^] (to Salton Sea)	Evaluating process upgrades to achieve regulatory compliance (still secondary). And expansion initially to 1.2 MGD, ultimately 1.8 MGD. [6]
City of Imperial Water Pollution Control Plant	2,689 (2.4 MGD) [7]	1,568 to 1,792 (1.4 to 1.6 MGD) [7]	Secondary with disinfection [7]	Dolson Drain / Salton Sea via Alamo River [+]	May be replaced by "Keystone" plant north of the city. [7]
City of Imperial proposed Keystone/Mesquite Lake WWRP	-----	-----	-----	-----	Ultimately 15 MGD, initially 5 MGD. Will at some point replace Imperial's existing plant. $40 million for the initial 5 MGD plant. $30 million to include only the equipment for 2.5 MGD capacity (and the structures for a full 5 MGD). Cost wise, for full build out of initial 5 MGD. [8]
Niland WWTP	560 (0.5 MGD) [9]	196 to 202 (0.175 to 0.18 MGD)[9]	Primary [9]		Various repairs are needed. Funding is a challenge. No increase in size or change in process is envisioned. [9]
Seeley County WWTP	224 (0.2 MGD) [10]	112 to 168 (0.1 to 0.15 MGD) [10]	Secondary with disinfection [10]	New River [+] / Salton Sea	
Westmorland WWTP	560 (0.5 MGD) [11]	246 (0.22 MGD)[11]	Primary[11]	Trifolium Drain No. 6 / Salton Sea via New River [+]	If a proposed annexation, adding maybe 400 homes occurs, an increase in plant size would be needed. But, no plans today. [11]
Totals	**28,438**	**15,937 to 16,282**			

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Personal Communications:

[1] Ruben Mireles, Brawley WWTP Operations Division Manager and Calipatria WWTP Chief Operator. June 16, 2009
[2] Arturo Estrada, Caliexico Municipal WWTP Chief Operator. June 17, 2009
[3] Randy Hines, El Centro WWTP Supervisor, June 15 and June 18, 2009
[4] Ed Delgado, County Administrative Analyst. June 28,2009; June 23, 2009; June 24, 2009
[5] Graciela Lopez Heber PUD Finance Manager. June 17, 2009
[6] Frank Cornejo. Hotville Municipal WWTP, Waterworks Supervisor. June 23, 2009.
[9] James Strang. Niland WWTP Lead Operator. June 23, 2009
[N] Jackie Loper, City of Imperial Water Pollution Control Plant Maintenance Supervisor. June 19, 2009
[8] Brian Knoll, Albert Well Associates. June 29, 2009
[10] Hector Orozco. Seeley County WWTP Chief Operator. June 24, 2009
[11] Lucas Agatep. Westmorland WWTP Chief Operator. June 18, 2009

+ From NPDES Permit
^ From Service Area Plan
Note: Date of information varies from NPDES permits and Service Area Plans.

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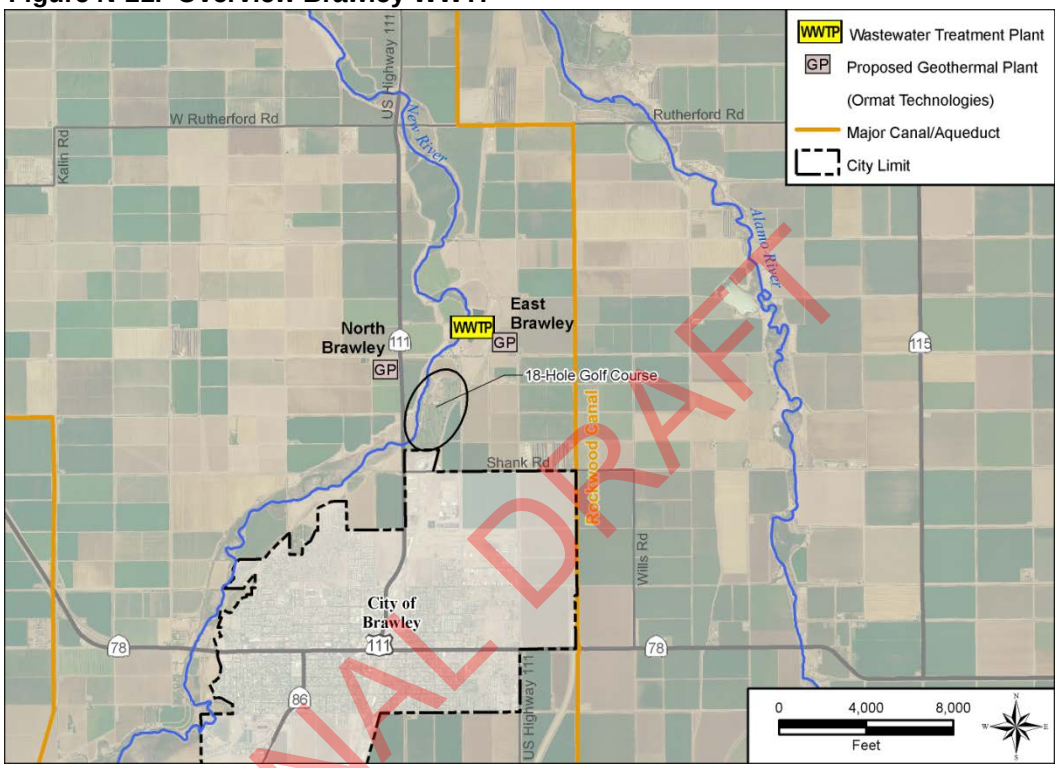
Brawley Wastewater Treatment Plant

The City of Brawley Wastewater Treatment Plant is located on Best Road on the east side of the Alamo River (Figure N-21). It is one mile north of the developed portion of Brawley and 2.5 miles north by north-east of the center of Brawley. The plant is adjacent to farmed lands. It is within 1.5 miles of two proposed geothermal plants. A golf course is located 0.5 miles to the south.

Figure N-21. Overview Brawley WWTP



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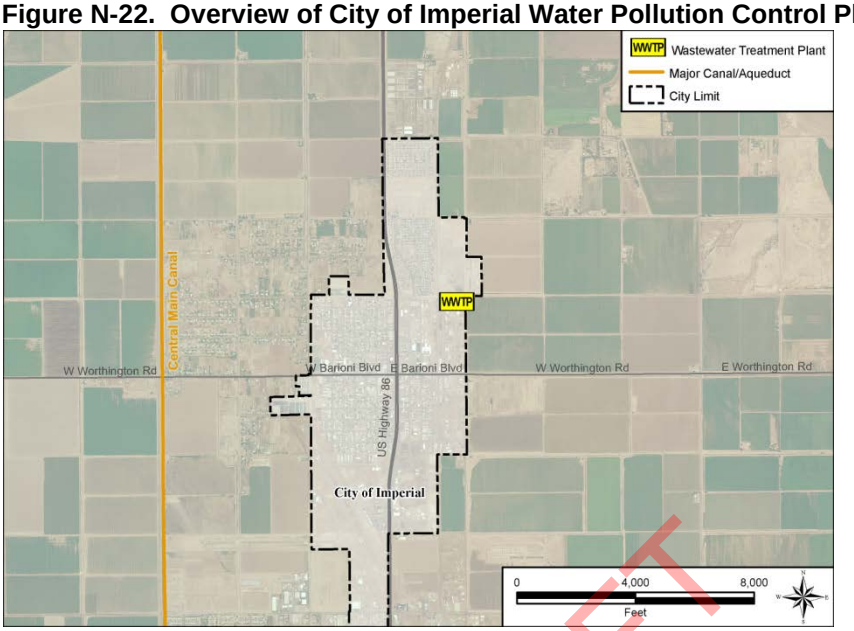
The plant capacity is 5.9 MGD with an average flow of 4.0 MGD. While the plant currently provides primary treatment, it is expected that construction will start in the near future to provide secondary treatment with disinfection.

There have been discussions between the City of Brawley and Ormat Technologies to provide effluent (with additional treatment) to Ormat for use in cooling towers. In addition, Ormat has investigated the costs of such treatment. Consideration has also been given to delivering recycled water to the golf course located just south of the plant, to Caltrans, and to a proposed ethanol plant.

City of Imperial Water Pollution Control Plant

The City of Imperial Water Pollution Control Plant has a capacity of 2.4 MGD and currently treats 1.5 MGD (Figure N-22). The city has taken a leading role in the planning for future development north of Imperial and south of Brawley. Part of the planning for the "Keystone Planning Area" is a proposed Keystone Regional Water Reclamation Facility. This proposed facility would include tertiary treatment and provisions for delivery of recycled water.

Figure N-22. Overview of City of Imperial Water Pollution Control Plant



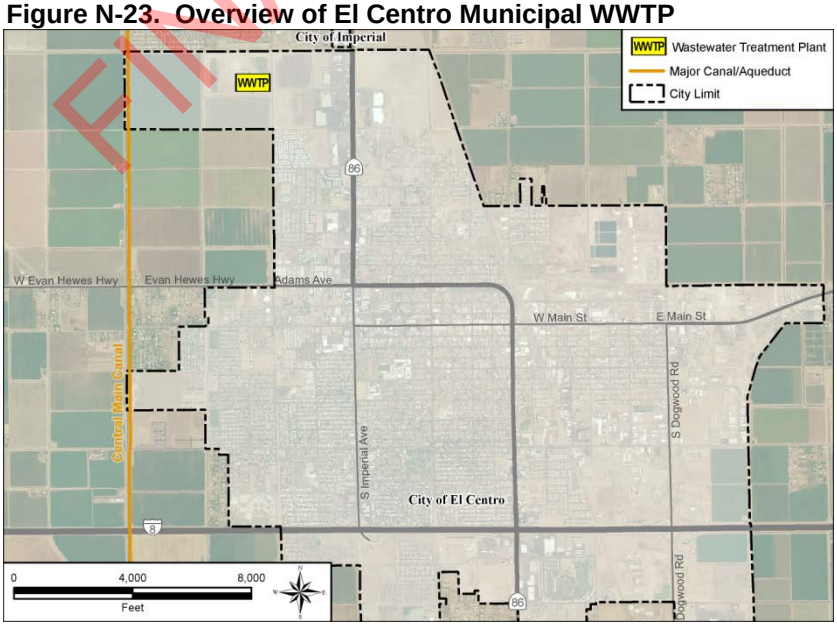
El Centro Municipal Wastewater Treatment Plant

The El Centro Municipal Wastewater Treatment Plant has a capacity of 8 MGD and an average flow of 3.6 MGD (Figure N-23). The plant provides secondary treatment with disinfection. The plant has compliance issues with selenium levels.

There has been interest expressed in delivery of recycled water to power plants or irrigation.

At present, no money has been committed for future capital projects at the plant.

Figure N-23. Overview of El Centro Municipal WWTP



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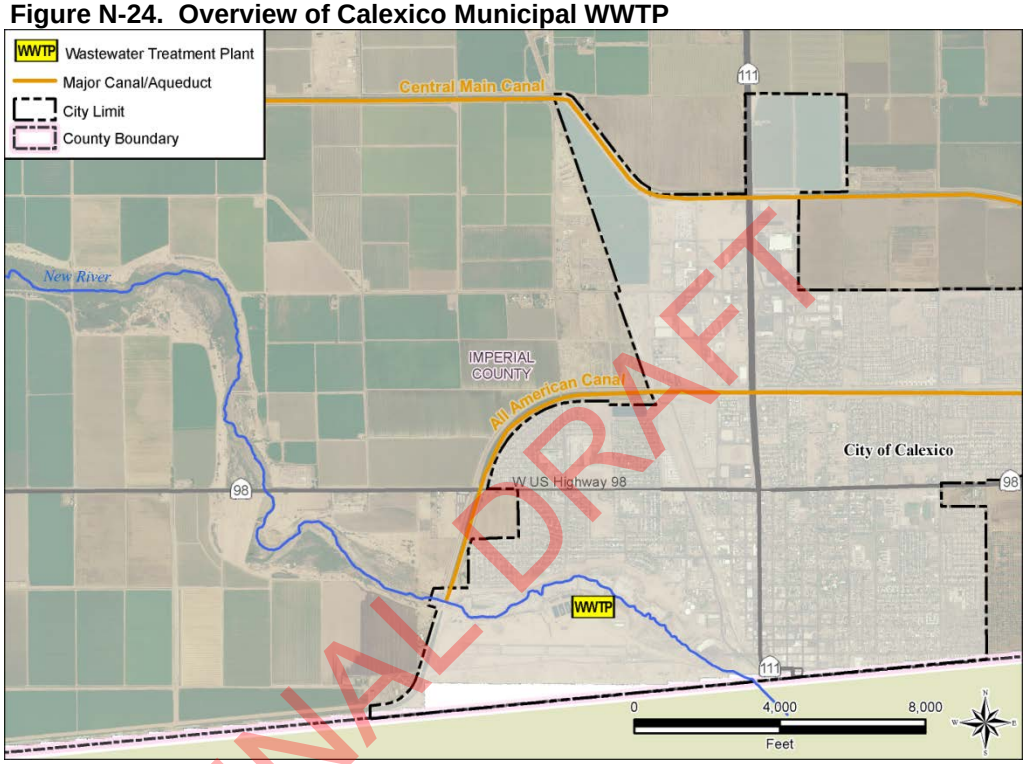
Calexico Municipal Wastewater Treatment Plant

The Calixico Wastewater Treatment Plant has a capacity of 4.3 MGD and an average flow of 2.7 to 2.9 MGD (Figure N-24). The plant provides secondary treatment with disinfection.

The majority of the process equipment at the plant is 40 years old. There are completed designs to upgrade the plant to advanced secondary treatment and a capacity of 8.5 MGD. Implementation of these plans has been slowed by the recession.

Figure N-24. Overview of Calexico Municipal WWTP



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N.3.1.2 Project Elements

The following subsection discusses the project elements that will then be combined into a series of Project Alternatives. Initially, it focuses on the markets for recycled water and the cost of conveying water to those markets. It then addresses improvements to the treatment plants.

Unit costs have been developed by a number of methods, depending on the available data. Where appropriate unit costs are available from IID's Definite Plan (Unit Cost Summary for Imperial Irrigation District System Conservation Projects), those costs have been used with a contingency factor of 30 percent. Generally, data is available from this source for storage and conveyance facilities. The cost of upgrading treatment facilities has been developed from an EPA survey (EPA, 2001). All costs have been updated to May 2009 price levels.

Markets for Recycled Water and Conveyance Costs

Four broad markets are being considered for recycled water use in this evaluation: (1) adjacent agriculture, (2) local municipal and industrial uses, (3) industrial use at power

plants, and (4) the IID distribution system. Table N-21 provides guidance on the accepted uses of recycled water and will be referred to later in this section.

Table N-21. Demand Sectors and Examples of Minimum Treatment Levels for Specific Uses to Protect Public Health3

Types of Use	*Treatment Level*		
	Disinfected Tertiary	*Disinfected Secondary*	*Undisinfected Secondary*
Urban Uses and Landscape Irrigation			
Fire protection	☑		
Toilet & urinal flushing	☑		
Irrigation of parks, schoolyards, residential landscaping	☑		
Irrigation of cemeteries, highway landscaping		☑	
Irrigation of nurseries		☑	
Landscape impoundment	☑	☑*	
Agricultural Irrigation			
Pasture for milk animals		☑	
Fodder and fiber crops			☑
Orchards (no contact between fruit and recycled water)			☑
Vineyards (no contact between fruit and recycled water)			☑
Non-food bearing trees			☑
Food crops eaten after processing		☑	
Food crops eaten raw	☑		
Commercial/Industrial			
Cooling & air conditioning - w/cooling towers	☑	☑*	
Structural fire fighting	☑		
Commercial car washes	☑		
Commercial laundries	☑		
Artificial snow making	☑		
Soil compaction, concrete mixing		☑	
Environmental and Other Uses			
Recreational ponds with body contact (swimming)	☑		
Wildlife habitat/wetland		☑	
Aquaculture	☑	☑*	
Groundwater Recharge			
Seawater intrusion barrier	☑*		
Replenishment of potable aquifers	☑*		

**Restrictions may apply*

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Agriculture near the WWTP

A common use of wastewater effluent is on crops adjacent to the treatment plant. Often, land disposal and application to crops is used as part of the treatment and disposal of treated effluent. In the southern portion of the San Joaquin Valley, this is the typical method of

[3] DWR Water Facts No. 23 – Water Recycling, October 2004

handling effluent. The majority of crops – with the exception of food crops eaten raw – can be grown with secondary effluent or disinfected secondary effluent. The majority of existing wastewater treatment plants within IID's service area provides secondary or disinfected secondary treatment.

A challenge with using recycled water for irrigation is that while the supply of recycled water is constant through the year, irrigation demand peaks during the summer. One is given a choice between building a distribution system large enough to use all available recycled water in the winter and supplementing the supply with other water in the summer; or building a smaller system that can meet summer demand and has excess supply in the winter. With the smaller system, there is recycled water in the winter that cannot be used.

The IID Definite Plan uses 5.25 feet/acre as the average water use within IID. If Colorado River diversions are used to proportion this amount to each month, approximately 5 percent, or 0.25 feet is used per month from December through February. Were the goal to apply 500 acre-feet of recycled water in one year, a distribution system would have to deliver to a quarter-section of cultivated land.[4] Additional water – presumably canal water delivered by IID – would be required from March through October to keep the land in production.

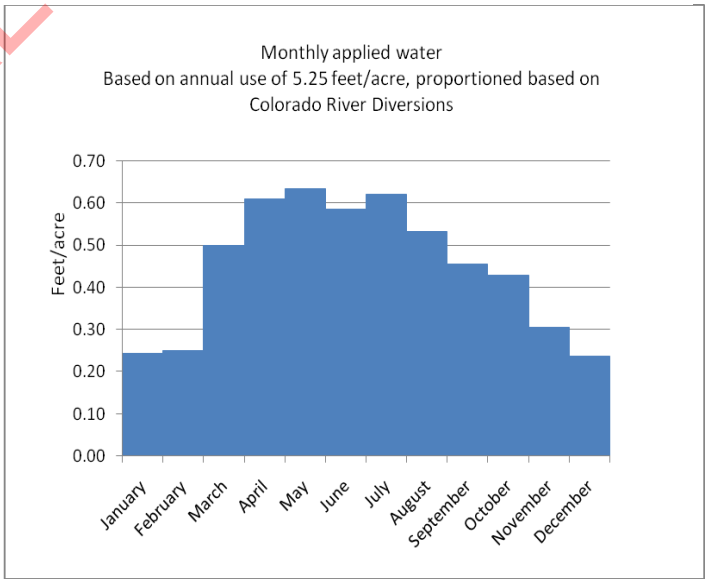
Design Basis

As discussed above and for planning purposes, the service area for each plant will include a quarter section (160 acres) for every 500 AFY of available recycled water (current average flow). The service areas were selected based on inspection of aerial photography. In one case (Brawley WWTP), some deliveries will be made to a short canal that it appears can be isolated from the remainder of the IID system – Spruce Lateral 5.

Pressure pipelines to the agriculture will be sized to flow at five feet per second. Costs will be based on the IID Definite Plan costs for PVC pipe with a 30 percent contingency.

Note that all areas served by recycled water will also need regular access to canal water as the service areas are sized based on winter demands – significantly lower than summer demands.

Figure N-25. Monthly Applied Water



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[4] 0.25 ft/acre/month * 12 months/year * 160 acres/quarter section ≈ 500 acre-feet/quarter section/year

Local Municipal and Industrial Use

Many communities in southern California have developed programs for direct use of recycled water for municipal and industrial purposes. The recycled water service area is typically served by dual piping. One system provides potable water for use inside residences and the majority of inside use at commercial facilities. The second system distributes recycled water predominately for irrigation and for some industrial uses.

While in some situations, a number of large, consistent customers are located close together provide a ready market, there is generally a significant challenge developing the customer base and constructing a distribution system large enough to use the available recycled water.

Serving recycled water to municipal and industrial customers would require tertiary treatment of wastewater.

Design Basis

Without a market survey of an area (including review of water sales to identify the potential market followed by discussions with potential users) it is extremely difficult to determine the market for recycled water in an area. Such a survey is beyond the scope of this investigation. For purposes of this study the following assumptions have been made:

- Deliveries are assumed to be for landscape irrigation. Annual deliveries are assumed to be 5.25 per acre (the same as IID's average agricultural deliveries). The extent of recycled systems will be limited to areas where the recycled supply can meet peak monthly demand. Thus, in non-peak months, there will be wastewater plant effluent that cannot be used as recycled water. Over the course of a year, the excess supply is 29 percent of total supply.[5]

- Tertiary treatment will be required for municipal and industrial use.

- One-day's storage will be provided at each plant to regulate flows. Conveyance has been sized with a peaking factor of four. This is equivalent to allowing all deliveries to be made in a six hour period. A relatively high peaking factor has been selected to allow irrigation to be done during the night reducing the likelihood of human contract. The pressure at the delivery point is assumed to be 80 pounds to allow pressurizing of sprinkler systems.

- Cost for use of recycled wastewater are typically higher when constructed to serve already developed metropolitan areas. Ideally, advanced planning for dual plumbing of new developments at the General or Specific plan stage of the land development process is preferred and costs can be incorporated into the community design.

[5] Some systems have been developed which combine various water sources into a non-potable system. Yucaipa Valley Water District has developed a non-potable system combining wastewater plant effluent, untreated surface water and backwash water from their water treatment plant.

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Industrial /Geothermal Market

This investigation has been initiated predominately by interest in developing additional geothermal power plants in Imperial County. Table N-22 shows the historic use of IID water at existing geothermal plants.

Table N-22. Historic Water Use at Geothermal Plants

Plant	Average Annual Deliveries by IID to Geothermal Plants (1997 – 2008) Acre-feet/year
Heber 1	1156
Heber 2	3663
Ormesa 11	1993
Ormesa 1	1655
Ormesa 1E	923
Ormesa 1H	1040
Leathers	1354
Elmore	1910
Vulcan	164
Del Ranch	948
Salton Sea 5	1120
Salton Sea 3 & 4	399
Salton Sea 1 & 2	10

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Recent investigations for Ormat Technologies

Recently Brawley and Ormat Technologies have been investigating opportunities for the use of effluent from the Brawly WWTP at Ormat facilities. The design basis for serving the Industrial/Geothermal Market will be based on work recently done for the City of Brawley and for Ormat Technologies.

The Brawley WWTP is to be reconstructed in the immediate future should anticipated funding be available. The design is complete and proposed improvements will provide secondary treatment with disinfection.

Ormat has had additional studies done to determine what additional treatment (beyond the proposed improvements) would be needed to provide water quality satisfactory for their use and deliver to their plant. Based on these investigations, additional treatment to remove organics would be required. Filters, including Dynasand filters, and MBR (Membrane Bioreactors) were evaluated. Cost would be from $129 to $308/AF for the additional treatment. The investigation found that no salt removal would be needed as Ormat injects cooling water. Ormat is seeking 8 MGD, and Brawley WWTP can provide only 4 MGD. The report is draft and no additional information was made available.

Recycled water use for industrial customers in the West Basin area of Los Angeles County

The recycled systems constructed for industrial customers in the service area of West Basin Municipal Water District are worth noting. The source water for this system is tertiary effluent from the City of Los Angeles Hyperion Wastewater Treatment System and it serves a number of industrial customers – typically oil refineries. Each of the customers has an agreement with West Basin defining the quality of water that will be delivered to them. West Basin provides desalted water (RO systems) to match the specifications of the customer.

Design Basis

This investigation assumed that recycled water delivered to power plants would have been tertiary treated and that no desalting would be required. The assumptions were consistent with those made for other municipal and industrial users.

IID Distribution System

Delivering recycled water to the canal system – if water quality concerns can be solved simplifies a number of challenges:

- If there are enough users downstream, the market for the recycled water is assured.
- As the recycled water supply and the surface water supply are blended, the delivery area can be large enough to provide a market for all the recycled water.
- Negligible storage at the WWTP may be needed.
- Distribution pipelines are minimized.

A concern with delivery to IID's distribution system is the use of the system to deliver raw water to municipal water treatment plants. Table N-23 shows the canals currently used for delivery to water treatment plants.

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Table N-23. Summary of the Canals that Provide Water to the Water Treatment Plants in IID

Community within Imperial County	Canals that Supply the Water Treatment Plants
Brawley	Mansfield and Central Main Canals
Calexico	Date and Dahlia Lateral #1 Canals
Calipatria	C West Lateral Gate #38
El Centro	Date and Dahlia Lateral #1 Canals
Heber	Dogwood Canal Gate #37
Holtville	Pear Canal
Imperial	Newside and Dahlia Canals
Niland	C West Lateral Gate #38
Seeley	Elder Canal
Westmorland	Westmorland Canal

Note: Information from the service area plans for Holtville (October 2006), Brawley (February 2007), Calipatria (November 2004), and Westmorland (March 2005); Information about the source of the water for the water treatment plants for Calexico (March 2007), El Centro (March 2006), and Imperial (December 2005) was found in the UWMP for that city.

Design Basis

The conveyance systems from the wastewater treatment plants to IIDs distribution system are sized without peaking and with a residual head of 25 psi at the canal.

Treatment upgrades and storage requirements

Determining the cost of treatment upgrades at a wastewater treatment plant for a reconnaissance level investigation presents significant challenges. For purposes of this study data developed for a national EPA study has been used (EPA 2001). That study developed costs for constructing wastewater treatment plants with various levels of treatment. For purposes of this investigation the cost of upgrading an existing treatment plant from secondary treatment to "advanced treatment with nutrient removal" was used. The EPA study states that the data it provides is the best that is available, but suggests that it is likely to provide a high costs. Significantly improving the accuracy of these estimates would require working with each plant operator to develop conceptual designs for required improvements which is beyond the scope of this investigation.

Where storage is needed to regulate delivery of recycled water, storage for one day's flow has been included at the wastewater plant. The storage cost is estimated assuming the reservoir will have earth berm side walls, 15-foot depth of water, be lined with a geotextile and have a floating cover. The storage can be located at the plant and at an elevation allowing delivery from the process trains without pumping. Costs will be based on the IID Definite Plan unit costs and include a 30 percent contingency. Costs would rise if additional lands are needed to be acquired for storage.

Mitigation

Any recycling project removes water from IID drains, the New River or the Alamo River; and, ultimately, from the Salton Sea. The QSA requires mitigation for the environmental impact of removing this water from the drains. This investigation presumes that the same mitigation cost would be required of a recycling project. Calculations of the mitigation cost

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were provided by IID and are based on USFWS and CDFG negotiated mitigation requirements (Wilcox, 2009).

The cost of mitigation cost includes a capital cost of $183.12 per acre foot of transferred water and an operation and maintenance (O&M) cost of $73.68 per acre foot.

N.3.2 Project Alternatives

Six recycled water alternatives have been laid out to bracket the possibilities for recycling. Table N-24 summarizes the elements of these alternatives. The cost information in the table will be discussed later in this section.

Alternatives 1, 2, and 3 use the four largest wastewater treatment plants within IID's service area (Brawley, Calexico, El Centro, and Imperial) as the supply source. These plants produce 80 percent of all wastewater effluent within IID's service area. The alternatives differ in the market that would receive the recycled water and the source of wastewater. These two factors then govern the level of treatment and the needed distribution system.

Alternatives 4, 5, and 6 presume the construction of a new wastewater treatment plant. The purpose was to evaluate a larger centralized plant and investigate the potential to realize economies of scale. The alternatives vary in how large an area wastewater would be collected from and in the market that would receive the recycled water.

These alternatives can also be divided by their potential customers. Alternatives 1, 2, 4, and 5 all look to develop distribution systems serving specific customers with recycled water. Alternatives 3 and 6 deliver recycled water to the IID distribution system for use by all IID customers located downstream of that delivery point.

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Table N-24. Recycled Water Alternatives

Design Components, "Cost Elements"	Configuration Alternatives					
	Existing plants (independently)			Central Plant - Keystone		
	1	2	3	4	5	6
Treatment Plant Location(s) and Treatment Level						
1 Brawley, Imperial, El Centro, and Calexico (Independently): Secondary with Disinfection						
2 Brawley, Imperial, El Centro, and Calexico (Independently): Tertiary with Disinfection						
3 Central Plant - Keystone: Tertiary with Disinfection - 7.5 MGD						
4 Central Plant - Keystone: Tertiary with Disinfection - 15 MGD						
Source Water						
1 Brawley						
2 Imperial						
3 El Centro						
4 Calexico						
5 Keystone/New Development Area						
Conveyance						
1 Surrounding Ag.						
2 Local Service Area Demand						
3 Industrial - Geothermal Plant (Brawley WWTP Only[3])						
4 Into Central Canal						
Project Cost (May 2009 Price Level, 4 percent real interest rate, 30-year project life)						
Capital Cost	$18,779,688	$140,568,145	$90,531,216	$51,323,359	$20,818,710	102,374,854
Annual O&M Cost	$ 486,671	$ 2,567,145	$,992,257	$ 1,438,723	$ 829,853	$ 2,280,145
Equivalent Annual Cost	$1,572,702	$10,726,215	$7,498,347	$ 4,406,758	$ 2,033,801	$ 8,200,493
Yield (AF)	13,331	11,674	13,331	4,696	6,611	16,808
Equivalent Annual Cost per AF	**$ 118**	**$ 919**	**$ 562**	**$ 938**	**$ 308**	**$ 488**

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N.3.2.1 Recycled Water Alternative 1 –Disinfected Secondary Effluent from Existing Wastewater Treatment Plants applied to adjacent agriculture

Description

Recycled Water Alternative 1 proposes delivering the effluent for agricultural use in the vicinity of each plant. These plants currently produce disinfected secondary effluent and no additional treatment would be needed for application to most crops (An exception is vegetables, eaten raw).

Improvements to each plant would include installation of storage for one day's flow. A pump station would be installed at the plant to allow delivery. New conveyance systems – Pump stations and pipelines – would deliver the recycled water from each plant to adjacent farms.

Table N-25 shows the amount of agricultural land each plant would serve based on the analysis presented in Section N.2.1.2.

Table N-25. Recycled Water Alternative 1 – Potentially Served Agricultural Area

Wastewater Treatment Plants	Average Effluent Flow [AFY]	Potentially served agricultural area at 5.25 af/acre
City of Brawley WWTP	4,481	9 quarter sections
City of Calexico Municipal WWTP	3,024 to 3,249 (use 3,137)	6 quarter sections
El Centro Municipal WWTP	4,033	8 quarter sections
City of Imperial Water Pollution Control Plant	1,568 to 1,792 (use 1640)	3 quarter sections

Each of these plants is discussed separately below.

Modifications to the Brawley WWTP would require construction of storage equal to an average days flow and conveyance to Spruce Lateral 5. Recycled water would be delivered to crops both from the pipeline and from Spruce Lateral 5 (Figure N-26). This distribution system assumes that a portion of the lateral could be isolated from the remainder of IID's system to assure that deliveries of recycled water would be only to limited acreage. Were this concept of using Spruce Lateral 5 not to work, then additional conveyance facilities would need to be constructed.[6]

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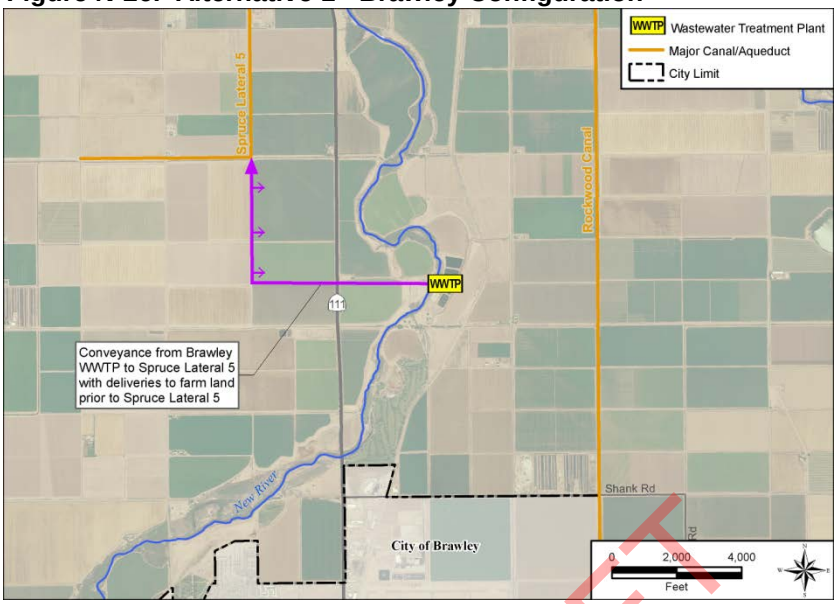
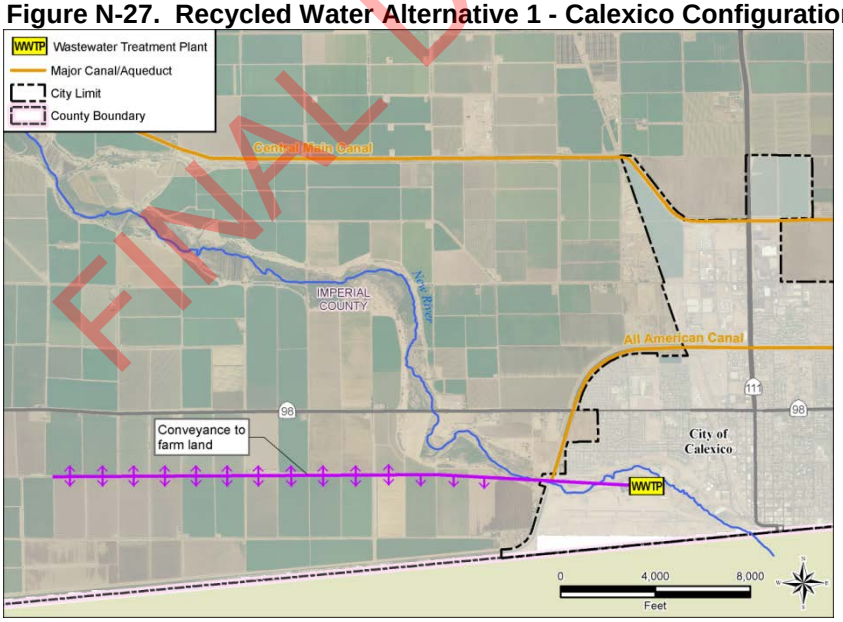
[6] The City of Brawley's web site indicates that the feasibility of serving recycled water to the golf course is currently being examined.

Figure N-26. Alternative 1 - Brawley Configuration



Modifications to the Calexico WWTP would include the construction of storage equal to an average day's flow and construction of a conveyance system including four miles of pipelines delivering recycled water to the west of the plant and of the All American Canal (Figure N-27).

Figure N-27. Recycled Water Alternative 1 - Calexico Configuration



Modifications to the El Centro WWTP would include construction of storage equal to an average days flow and construction of a conveyance system including 4.5 miles of pipelines to the west (Figure N-28). Inspection of aerial photography indicates that this area is close to existing urbanized areas. Were these areas to develop, the recycled water would have to be delivered elsewhere.

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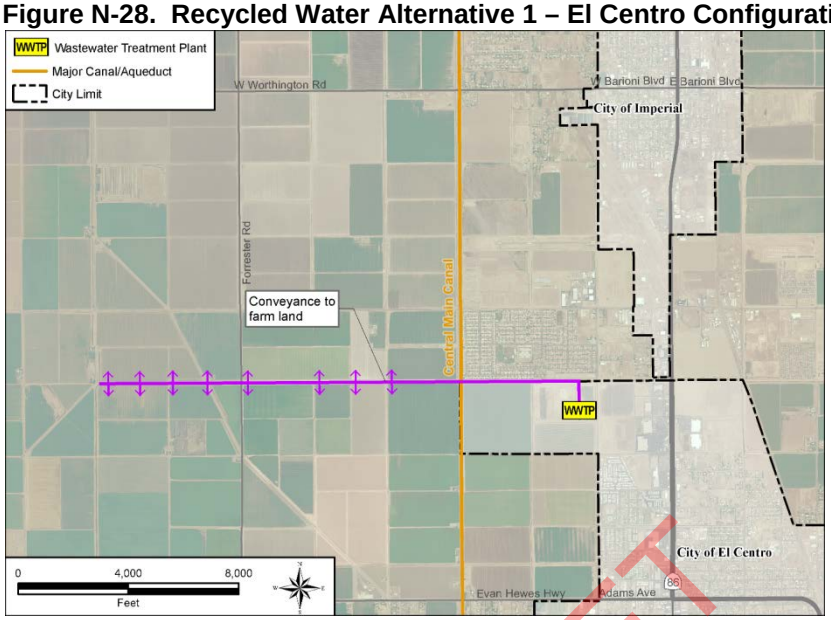
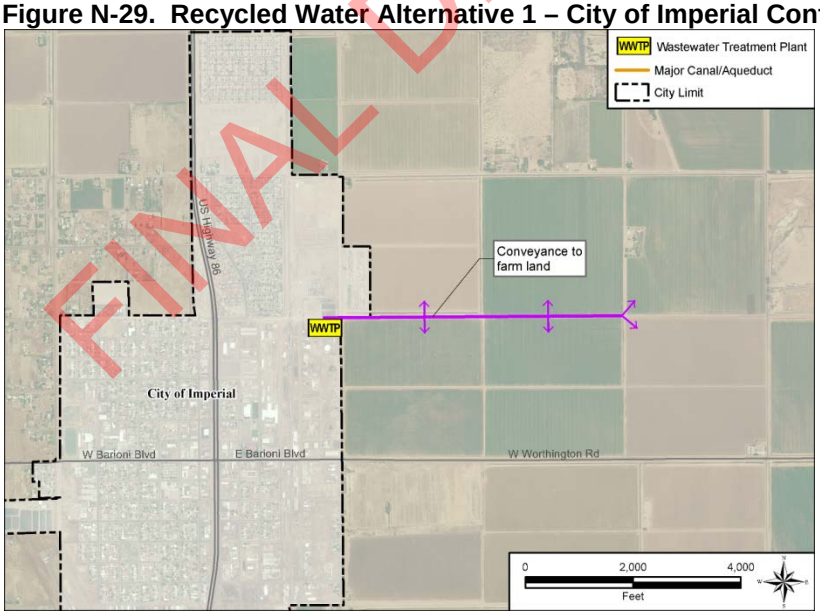
Figure N-28. Recycled Water Alternative 1 – El Centro Configuration



Modifications to the City of Imperial Water Pollution Control Plant would include construction of storage equal to an average days flow and construction of a conveyance system including one mile of pipeline (Figure N-29).

Figure N-29. Recycled Water Alternative 1 – City of Imperial Configuration



Recycled Water Alternative 1 would produce 13,331 AFY yield. It is technically feasible and the cost, at $118 per AF, within the cost limits developed for this investigation. It will be carried forward for further investigation.

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Cost

The capital cost of Recycled Water Alternative 1 would be on the order of $18,800,000. The alternative would deliver 13,300 AFY at a cost of approximately $ 118 per acre foot (May 2009 price level, 4 percent real interest rate, 30 year project life). Approximately half of this cost is mitigation costs. On-farm costs to facilitate use of recycled water have not been addressed in this calculation. Table N-26 presents the cost of developing these systems.

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Table N-26. Recycled Water Alternative 1 Disinfected Secondary Effluent from Existing WWTP applied to adjacent agriculture (May 2009 price level, 4 percent real interest rate, 30 year project life

	Total
Recycled Facilities (Storage & Conveyance) at Brawley WWTP	
Capital Cost	
Storage (4.0 MG, 12.3 af)	$ 1,267,578
Pumping Facilities, 2@100 hp incl standby	287,040
Pipelines (conveyance to Spruce Lateral 5)	2,543,112
Irrigation Turnouts	576,122
Check Structures	78,000
Mitigation Costs (reduced drain flows)	820,561
On-Farm costs, if any	not included
Capital Cost	$ 5,572,413
O&M Costs	
O&M Costs	168,052
Financial Analysis (4%, 30 years)	
Equivalent Annual Cost	$ 490,305
Yield (AFY)	4,481
Equivalent Annual Cost per acre-foot	$164
Recycled Facilities (Storage & Conveyance) at Calexico WWTP	
Capital Cost	
Storage (2.8 MG, 8.6 af)	$ 891,072
Pumping Facilities, 2 @ 100 hp incl standby	266,240
Pipelines (conveyance to west for 4.5 miles)	3,442,982
Irrigation Turnouts	1,456,775
Mitigation Costs (reduced drain flows)	574,447
On-Farm costs, if any	not included
Capital Cost	$ 6,631,517
O&M Costs	
O&M Costs	119,521
Financial Analysis (4%, 30 years)	
Equivalent Annual Cost	$ 503,023
Yield (AFY)	3,137
Equivalent Annual Cost per acre-foot	$160

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Recycled Facilities (Storage & Conveyance) at El Centro WWTP	
Capital Cost	
Storage (3.6 MGD, 11.1 af)	$ 1,021,176
Pumping Facilities, 100 hp + standby	234,806
Pipelines (conveyance to west for 4.5 miles)	2,065,789
Irrigation Turnouts	374,400
Mitigation Costs (reduced drain flows)	738,523
On-Farm costs, if any	not included
Capital Cost	$4,434,694
O&M Costs	
O&M Costs	151,981
Financial Analysis (4%, 30 years)	
Equivalent Annual Cost	$408,440
Yield (AFY)	4,033
Equivalent Annual Cost per acre-foot	$156

Recycled Facilities (Storage & Conveyance) at Imperial WWTP	
Capital Cost	
Storage (1.5 MG, 4.6 af)	$ 652,626
Pumping Facilities, 20 hp + standby	178,152
Pipelines (conveyance to east for 1 mile)	815,443
Irrigation Turnouts	187,200
Mitigation Costs (reduced drain flows)	307,642
On-Farm costs, if any	not included
Capital Cost	$ 2,141,063
O&M Costs	
O&M Costs	47,117
Financial Analysis (4%, 30 years)	
Equivalent Annual Cost	$262,847
Yield (AFY)	1,680
Equivalent Annual Cost per acre-foot	$102

Recycled Water Alternative 1 - Summary Costs	
Capital Cost	$ 18,779,688
O&M Costs	486,671
Equivalent Annual Cost	1,572,702
Yield (AFY)	13,331
Equivalent Annual Cost per acre-foot	$ 118

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N.3.2.2 Recycled Water Alternative 2 – Upgrade Existing Plants to Tertiary and deliver effluent to a local market

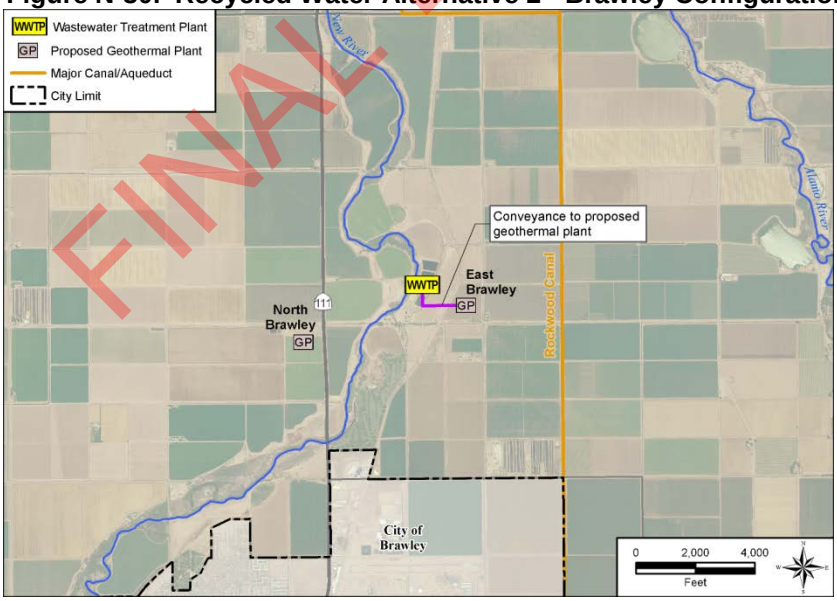
Description

Recycled Water Alternative 2 proposes upgrading the four largest plants from secondary to tertiary treatment and delivering their effluent to municipal and industrial use in the adjacent communities. This alternative presents a number of challenges. The cost of upgrading the treatment process is high. Identifying the customers who would receive the water is required. If the customers are existing MCI customers, this alternative would require constructing new distribution systems through established communities and require modifications of the customer's on-site plumbing systems. If the customers are in future developments, then, with appropriate regulation, the required infrastructure (dual plumbing) could be established when the area developed. In the absence of known major industrial customers, the size of the service areas of this alternative would be limited by a wastewater plants ability to meet the summer peak demand for irrigation. Thus, during the winter, there would be effluent that cannot be marketed.

Each of these plants is discussed separately below.

The Brawley WWTP is located close to two proposed geothermal power plants. The proposed East Brawley plant is one-half mile to the southeast and the proposed West Brawley plant is one mile to the southwest. This alternative delivers the entire flow of the Brawley WWTP to the East Brawley plant (Figure N-30).

Figure N-30. Recycled Water Alternative 2 - Brawley Configuration



The Calexico WWTP could potentially serve approximately 422 acres of irrigated landscape (0.62ft/month irrigation required in the peak month) (Figure N-31). Inspection of aerial photographs indicates that there may be 44 acres of large irrigated areas within two miles of the plant (10 sites from 2 to 8 acres each). It would take roughly 3.0 miles of pipe to serve these areas. The remaining 378 acres to be served could be new development spread over a

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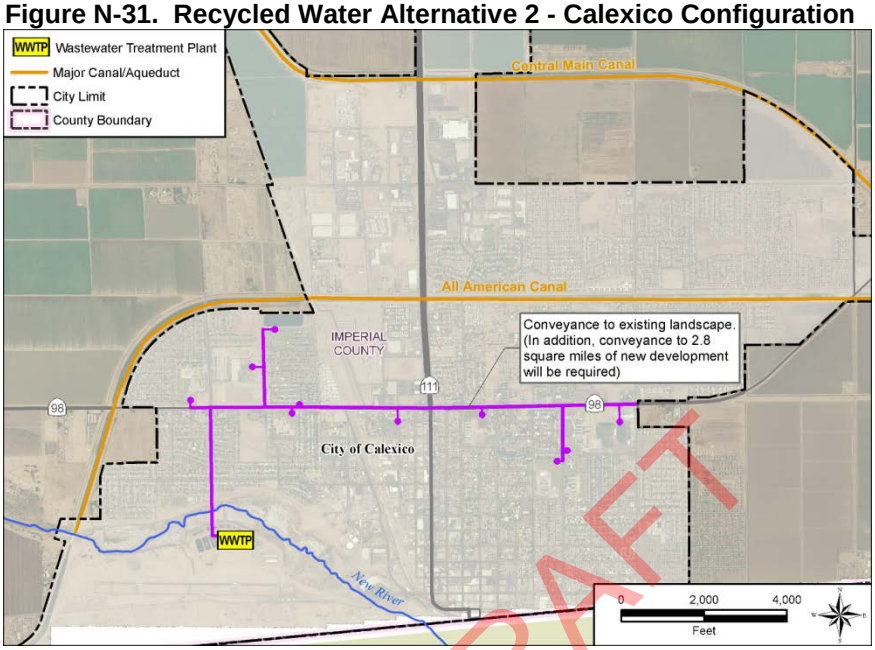
total area of 2.4 square miles. Approximately 2,200 AFY of recycled water would be served by this system.

Figure N-31. Recycled Water Alternative 2 - Calexico Configuration



The El Centro WWTP could potentially serve approximately 542 acres of irrigated landscape (0.62ft/month irrigation required in the peak month) (Figure N-32). Inspection of aerial photographs indicates that there may be 100 acres of large irrigated areas within two miles of the plant (Six sites with 6 acres to 40 acres of irrigated landscape). It would take roughly 4.5 miles of pipe to serve these areas. The remaining 442 acres to be served could be new development spread over a total area of approximately 2.8 square miles. Approximately 2,200 AFY of recycled water would be served by this system.

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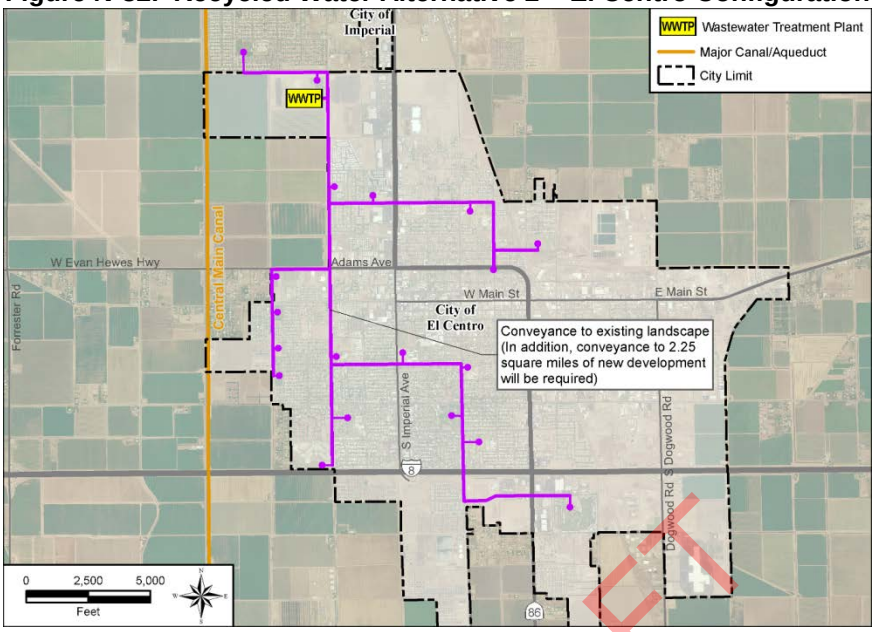
Figure N-32. Recycled Water Alternative 2 – El Centro Configuration



The City of Imperial Water Pollution Control Plant could potentially serve approximately 226 acres of irrigated landscape (0.62ft/month irrigation required in the peak month) (Figure N-33). Inspection of aerial photographs indicates that there may be 19 acres of large irrigated areas within one mile of the plant. It would take roughly 1.25 miles of pipe to serve these areas. The remaining 207 acres to be served could be new development spread over a total area of approximately 1.3 square miles. Approximately 1,200 AFY of recycled water would be served by this system.

Recycled Water Alternative 2 would produce 11,674 AFY yield. While it is technically feasible, the cost, at $919 per AF, is beyond the cost limits developed for this investigation. It will not be carried forward for further investigation.

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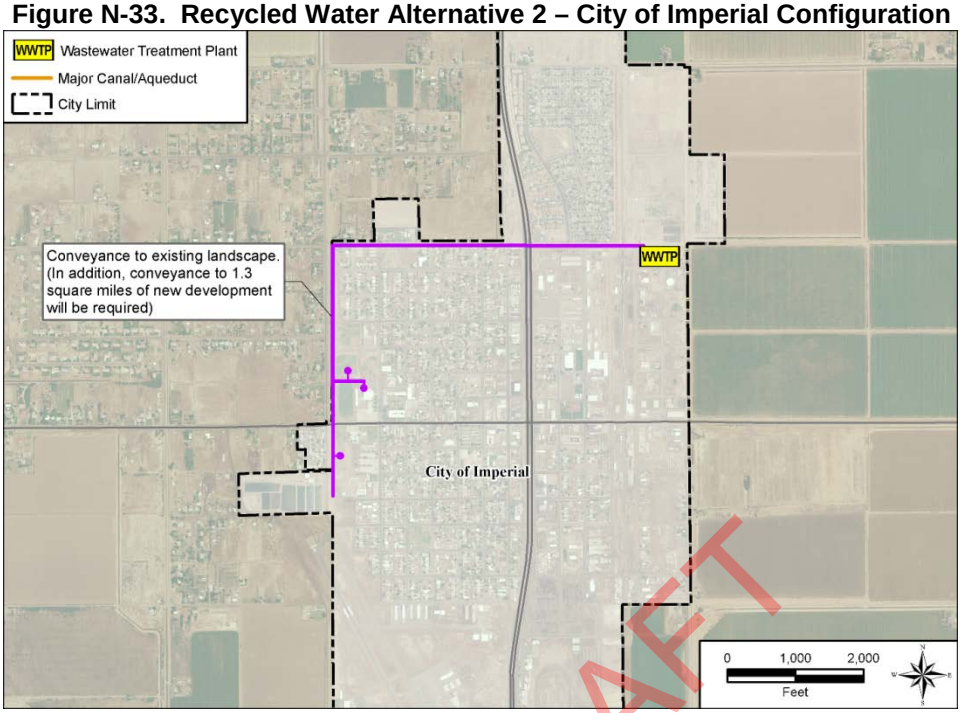
Figure N-33. Recycled Water Alternative 2 – City of Imperial Configuration



Cost

The capital cost of Recycled Water Alternative 2 would be on the order of $141 million Approximately half of that cost is for an increased level of treatment. The alternative would deliver 11,674 AFY at a cost of approximately $919 per acre foot (May 2009 price level, 4 percent real interest rate, 30-year project life). Approximately 60 percent of the capital cost is for treatment. Significant amounts (not included in this estimate) would also be needed to connect irrigation uses in large areas of future developments. Costs included by the users of the recycled water to facilitate use of recycled water have not been addressed in this calculation. Table N-27 presents the cost of developing these systems.

The costs per acre-foot for three of the plants are similar – Imperial, El Centro, and Calexico. The cost per acre-foot for the Brawley WWTP is significantly lower ($448) than the others as all deliveries are to the proposed geothermal power plant one-half mile away rather than to a number of irrigation users. Distribution costs are lower and (due to the constant demand of the plant) all available effluent is used.

A previous analysis prepared for Ormat Technologies by another firm, found a much lower cost ranging from: $129/acre-foot to $308/acre-foot as opposed to $448/acre-foot. While the source of the difference cannot be determined, it is probable that the firm which prepared the previous analysis had more specific knowledge of treatment requirements. It is unlikely that the previous analysis included mitigation costs.

Table N-27. Recycled Water Alternative 2 – Tertiary Treatment applied to local market (May 2009 price level, 4% real interest rate, 30 year project life)

Recycled Facilities (Storage & Conveyance) at Brawley WWTP
Capital Cost

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Tertiary Treatment (4.0 MGD)	$ 24,326,976
Storage (4.0 MG, 12.3 af)	1,267,578
Pumping Facilities, 3 @ 40 hp incl standby (deliver to Ormat)	270,348
Pipelines to Ormat Technologies	119,180
Mitigation Costs (reduced drain flows)	820,561
On-site costs	not included
Capital Cost	$ 26,804,643
O&M Costs	
O&M Costs	$ 638,824
Financial Analysis (4%, 30 years)	
Equivalent Annual Cost	$2,188,939
Yield (AFY)	4,481
Equivalent Annual Cost per acre-foot	$488

Recycled Facilities (Storage & Conveyance) at Calexico WWTP

Capital Cost	
Tertiary Treatment (2.8 MGD)	$ 18,837,421
Storage (2.8 MG, 8.6 af)	891,072
Pumping Facilities, 4 @ 100 hp including standby	565,344
Pipelines (2.4 square miles of new dev)	17,417,867
Pipelines (existing development)	2,816,986
Mitigation Costs (reduced drain flows)	574,447
On-site costs	not included
Capital Cost	$ 40,528,689
O&M Costs	
O&M Costs	680,129
Financial Analysis (4%, 30 years)	
Equivalent Annual Cost	$3,023,907
Water delivered (acre-feet/year)	3,137
Equivalent Annual Cost per acre-foot	$964

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Recycled Facilities (Storage & Conveyance) at El Centro WWTP	
Capital Cost	
Tertiary Treatment (3.6 MGD)	$ 22,557,748
Storage (3.6 MGD, 11.1 af)	1,021,176
Pumping Facilities, 4 each @ 200 hp, incl standby, VFDs	1,186,380
Pipelines (2.25 square miles of new dev)	16,329,250
Pipelines (Serving exist development)	7,708,656
Mitigation Costs (reduced drain flows)	524,351
On-Site costs	not included
Capital Cost	$ 49,327,562
O&M Costs	
O&M Costs	719,616
Financial Analysis (4%, 30 years)	
Equivalent Annual Cost	$3,572,234
Yield (AFY)	2,863
Equivalent Annual Cost per acre-foot	$1,248

Recycled Facilities (Storage & Conveyance) at Imperial WWTP	
Capital Cost	
Tertiary Treatment (1.5 MGD)	$ 12,030,992
Storage (1.5 MGD, 4.6 af)	627,525
Pumping Facilities, 4 @ 40 hp including standby	304,512
Pipelines serving existing development	1,291,118
Pipelines (1.3 square miles of new dev)	9,434,678
Mitigation Costs (reduced drain flows)	218,426
On-site costs	not included
Capital Cost	$ 23,907,251
O&M Costs	
O&M Costs	558,576
Financial Analysis (4%, 30 years)	
Equivalent Annual Cost	$1,941,135
Yield (AFY)	1,193
Equivalent Annual Cost per acre-foot	$1,627

Recycled Water Alternative 2 - Summary Costs	
Capital Cost	$ 140,568,145
O&M Costs	2,597,145
Equivalent Annual Cost	$ 10,726,215
Yield (AFY)	11,674
Equivalent Annual Cost per acre-foot	**$ 919**

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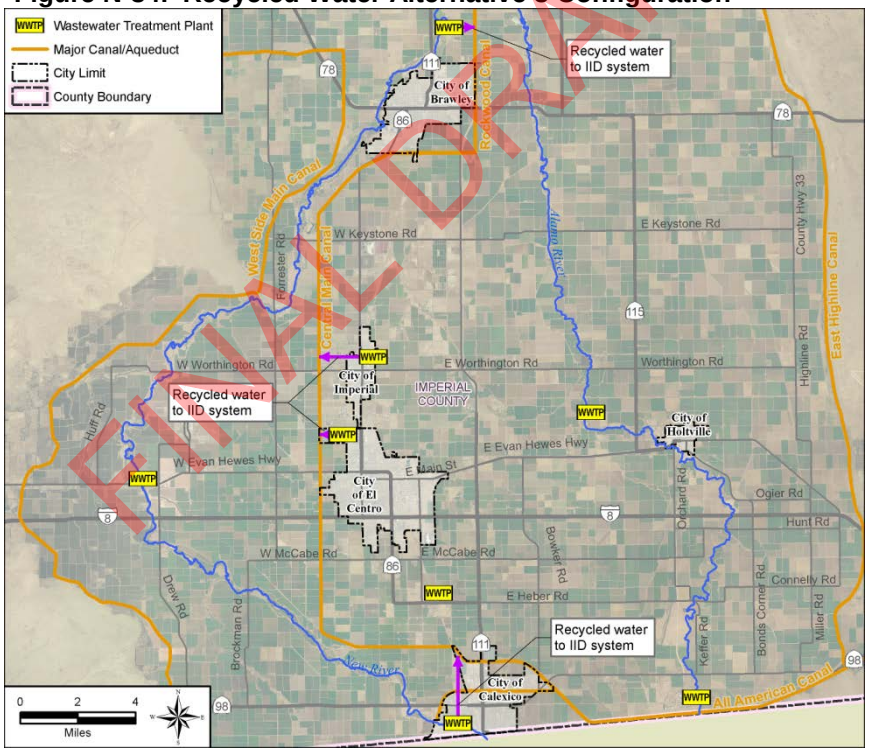
N.3.2.3 Recycled Water Alternative 3 – Upgrade existing plants to tertiary and deliver effluent to IID canal system

Description

Recycled Water Alternative 3 (like Recycled Water Alternative 2) proposes upgrading the four largest plants from secondary to tertiary treatment, but the deliveries would be made to IID's canal system rather than developing separate distribution systems for deliveries from each plant (Figure N-34). The purpose of this analysis was to test the reduction in cost from elimination of the dual plumbing system and distribution in already developed areas. This alternative presumes that the institutional and regulatory issues associated with delivering tertiary treated water to a raw water system can be solved. If they can be, then the challenges of developing a market for recycled water and the purple pipe distribution system to deliver that water is solved.

As deliveries from the treatment plants are made to IID's distribution system, those deliveries can most likely be regulated by the distribution system – both on a daily and on a seasonal basis. Thus, no storage would be needed at the treatment plant and all effluent can be used.

Figure N-34. Recycled Water Alternative 3 Configuration



Recycled Water Alternative 3 would produce 13,331 AFY yield. It is technically feasible and the cost, at $562 per AF, is within the cost limits developed for this investigation. It will be carried forward for further investigation.

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Cost

Table N-28 presents the cost of developing this alternative.

Table N-28. Recycled Water Alternative 3 – Tertiary Treated Water into the Central Main Canal (May 2009 price level, 4% real interest rate, 30 year project life)

Recycled Facilities (Storage & Conveyance) at Brawley WWTP	
Capital Cost	
Tertiary Treatment (4.0 MGD)	$ 24,326,976
Pumping Facilities, 3 @ 30 including standby	480,480
Pipelines (conveyance to Rockwood Canal)	1,441,326
Turnout to canal	23,400
Mitigation Costs (reduced drain flows)	820,561
Capital Cost	$ 27,092,743
O&M Costs	
O&M Costs	625,459
Financial Analysis (4%, 30 years)	
Equivalent Annual Cost	$2,192,235
Yield (AFY)	4,481
Equivalent Annual Cost per acre-foot	$489
Recycled Facilities (Storage & Conveyance) at Calexico WWTP	
Capital Cost	
Tertiary Treatment (2.8 MGD)	18,837,421
Pumping Facilities, 3 @ 30 including standby	480,480
Pipelines (2.5 miles to Central Main Canal)	3,011,237
Turnout to canal	23,400
Mitigation Costs (reduced drain flows)	574,447
Capital Cost	$ 22,926,985
O&M Costs	
O&M Costs	593,462
Financial Analysis (4%, 30 years)	
Equivalent Annual Cost	$1,919,332
Yield (AFY)	3,137
Equivalent Annual Cost per acre-foot	$612

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Recycled Facilities (Storage & Conveyance) at El Centro WWTP	
Capital Cost	
Tertiary Treatment (3.6 MGD)	$ 23,553,391
Pumping Facilities (3 @ 40 hp)	493,116
Pipelines (3.0 miles to Central main Canal)	3,098,684
Turnout to canal	23,400
Mitigation Costs (reduced drain flows)	738,523
Capital Cost	$ 27,907,114
O&M Costs	
O&M Costs	715,509
Financial Analysis (4%, 30 years)	
Equivalent Annual Cost	$2,329,380
Water delivered	4,033
Equivalent Annual Cost per acre-foot	$578

Recycled Facilities (Storage & Conveyance) at Imperial WWTP	
Capital Cost	
Tertiary Treatment (1.5 MGD)	10,302,585
Pumping Facilities, 2@ 30 hp incl standby	409,188
Pipelines (conveyance to Central Main Canal)	1,561,560
Turnout to canal	23,400
Mitigation Costs (reduced drain flows)	307,642
Capital Cost	12,604,374
O&M Costs	
O&M Costs	328,489
Financial Analysis (4%, 30 years)	
Equivalent Annual Cost	$1,057,401
Yield (AFY)	1,680
Equivalent Annual Cost per acre-foot	$629

Recycled Water Alternative 3 - Summary Costs	
Capital Cost	$ 90,531,216
O&M Costs	2,992,257
Equivalent Annual Cost	7,498,347
Yield (AFY)	13,331
Equivalent Annual Cost per acre-foot	**$ 562**

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N.3.2.4 Recycled Water Alternative 4 – Regional plant serving tertiary water locally

Description

Recycled Water Alternative 4 proposes construction of a new, regional wastewater treatment plant located between the cities of Imperial and Brawley, in the Keystone Planning Area (Figure N-35). At this time, a design exists for a 5 MGD Keystone Regional Water Reclamation Facility. The expected ultimate treatment capacity needed for all proposed new development in the Keystone Planning Area is 15 MGD, and the proposed plant can be expanded to that size. The plant is proposed to provide tertiary treatment with the intent of delivering the treated effluent to a recycled water system serving new development located between the two cities.

This investigation assumes that the treatment plant would be constructed to meet future needs for wastewater treatment. If the effluent were not intended to be recycled, then the plant would be built to provide secondary treatment. Thus, only the increment treatment from secondary to tertiary is included in this investigation.

This alternative assumes construction of a 7.5 MGD tertiary treatment plant with an average effluent flow of 5.9 MGD. The size plant was selected based on the brief market analysis for recycled water that follows.

The Mesquite Lake Specific Plan Area, surrounding the proposed plant, is 5,100 acres zoned for industry with railway access (IVEDC, 2007). Under the presumption that industrial use would consist of warehousing, distribution and food processing, it appears that there would be few customers for significant amounts of recycled water here. More distant from the proposed plant are a number of proposed subdivisions including Rancho Los Lagos Specific Plan and the 101 Ranch Specific Plan located south of Brawley; Barioni Lakes located north of the City of Imperial; and a number of developments located east of Imperial (Imperial County, 2009). These proposed developments may be markets for recycled water. Rancho Los Lagos is proposed to include a golf course, other parks and schools (say 220 acres out of 1,200 acres). Barioni Lakes includes 95 acres of park land including recreational lakes and 82 acres of schools out of 1,100 total acres. An “Imperial Regional Sports park” is proposed for the southeast corner of Neckel Road and Dogwood Road, approximately two miles east of the City of Imperial. This park may be 160 acres. These developments and the developments on the east side of Imperial may eventually contain enough landscaping to provide a market for a recycled water treatment plant producing 5.9 MGD. Due to the varying irrigation demands through the year, the actual amount of recycled water used would average less than 5.9 MGD.

Recycled Water Alternative 4 would produce 4,696 AFY yield. While it is technically feasible and the cost, at $938 per AF, it is beyond the cost limits developed for this investigation. It will not be carried forward for further investigation.

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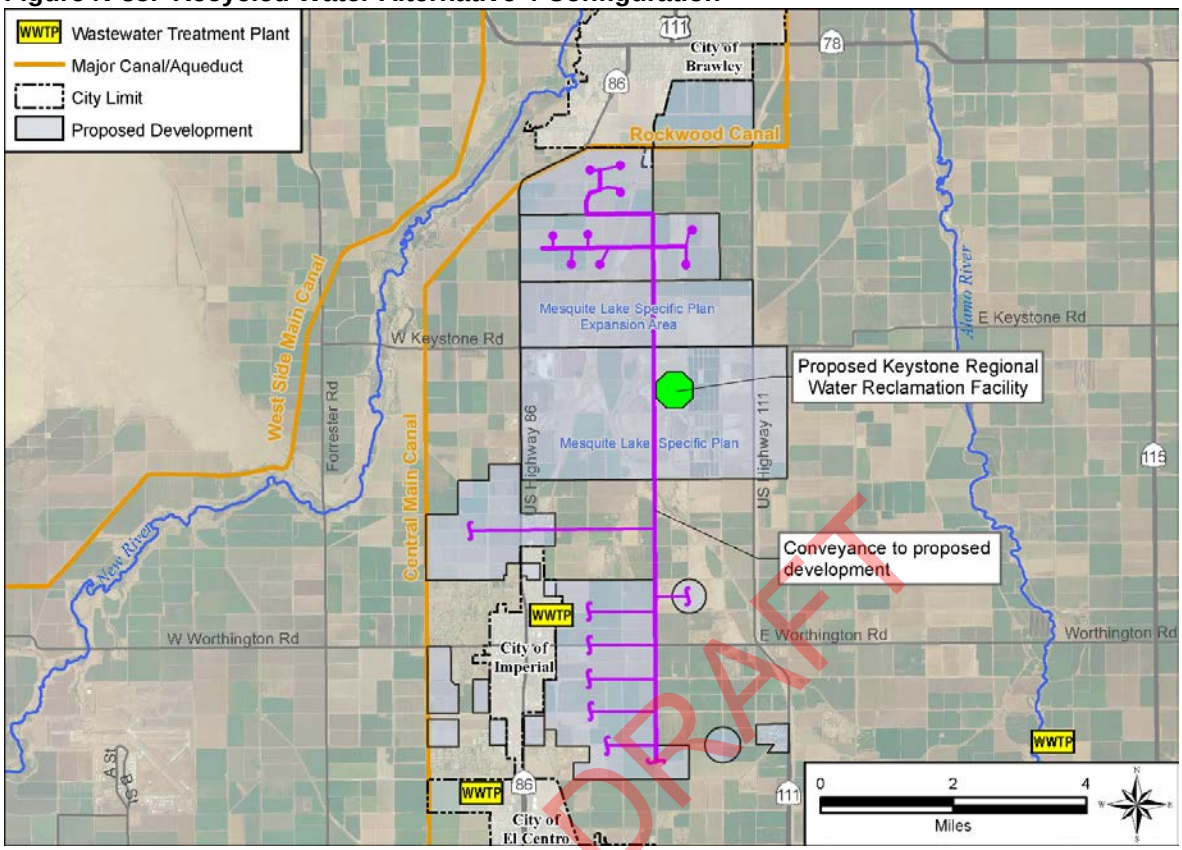
Figure N-35. Recycled Water Alternative 4 Configuration



Cost

Table N-29 gives a more detailed cost estimate.

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Table N-29. Recycled Water Alternative 4 – Keystone Regional Water Reclamation Plant delivering to future MCI customers (May 2009 price level, 4% real interest rate, 30 year project life)

Recycled Facilities (Storage & Conveyance) at Keystone Regional Water Reclamation Facility		
Capital Cost	**$**	**15,729,759**
Tertiary Treatment (7.5MGD. Cost over secondary)		
Storage (One day's flow)		1,162,672
Pumping Facilities, 6 @ 200 including standby		2,030,652
Recycled Water Pipelines		32,400,276
Turnout to canal		-
Mitigation Costs (for reduced drain flows)		-
On-site costs		not included
Capital Cost	$	51,323,358
O&M Costs		
O&M Costs	$	1,438,723
Financial Analysis (4%, 30 years)		
Equivalent Annual Cost		$4,406,758
Yield (AFY)		4,696
Equivalent Annual Cost per acre-foot		**$938**

N.3.2.5 Recycled Water Alternative 5 – Regional Plant serving tertiary water to IID canal

Description

Recycled Water Alternative 5 proposes construction of a new, regional wastewater treatment plant located between the cities of Imperial and Brawley, in the Keystone Planning Area (Figure N-36). The proposed plant would be identical to the one proposed in Recycled Water Alternative 4: a 7.5 MGD tertiary treatment plant with an average effluent flow of 5.9 MGD.

This alternative would require construction of sewer force mains and lift stations to direct flow from the four existing plants to the new Keystone Regional Plant. However, this alternative presumes delivery of the plant effluent to IID's distribution system at the Central Canal located 3.5 miles west of the proposed plant. Because the delivery is to IID's distribution system, all of the plant effluent can be recycled (Alternative 4 was limited by a need to meet the peak summer demand in its market area).

Recycled Water Alternative 5 would yield 6,611 AFY. It is technically feasible and the cost, at $308 per AF, is within the cost limits developed for this investigation. It will be carried forward for further investigation.

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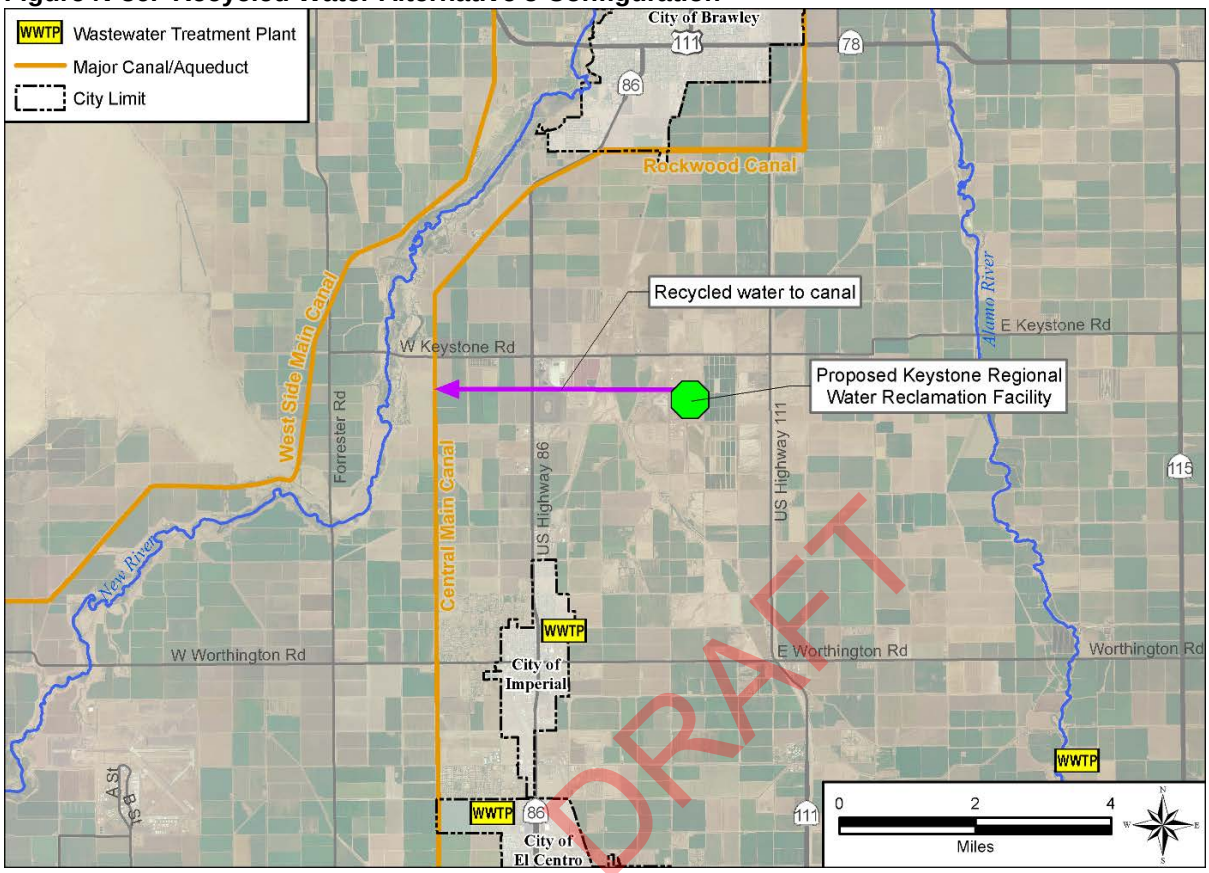
Figure N-36. Recycled Water Alternative 5 Configuration



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Cost

Recycled Water Alternative 5 has an estimated capital cost of $21 million. This capital cost is dominated by the treatment costs. Recycled Water Alternative 4's extensive recycled conveyance system is not needed. The system would deliver 6,600 acre-feet of recycled water per year at an equivalent annual cost of $308 per acre-foot. Table N-30 gives a more detailed cost estimate.

Table N-30. Recycled Water Alternative 5 – Keystone Regional Water Reclamation Plant delivering to Central Canal (May 2009 price level, 4% real interest rate, 30 year project life)

Capital Cost		
Tertiary Treatment (7.5MGD. Cost over secondary)	$	15,729,759
Pumping Facilities for recycled system, 3 @ 100 including standby		447,470
Pipeline to Canal		4,566,482
Turnout to canal		75,000
Mitigation Costs (reduced drain flows)		-
Capital Cost	$	20,818,710
O&M Costs		
O&M Costs	$	829,853
Financial Analysis (4%, 30 years)		
Equivalent Annual Capital Cost		$1,203,948
O&M		829,853
Equivalent Annual Cost		$2,033,801
Yield (AFY)		6,611
Equivalent Annual Cost per acre-foot		$308

N.3.2.6 Recycled Water Alternative 6 – Regional Plant serving tertiary water to local service area and IID canal

Description

Recycled Water Alternative 6 proposes the replacement of the existing wastewater treatment plants in Brawley, Imperial, El Centro and Calexico with a new regional plant that would serve these cities and serve future needs in the Keystone Planning Area (Figure N-37). The proposed plant would be twice the plant proposed in Recycled Water Alternatives 4 and 5: a 15 MGD tertiary treatment plant. Current average flows at the four existing plants are 11.9 MGD. For this investigation we have presumed that the plants average flow would equal the maximum flow.

Like Recycled Water Alternative 5, assumes all of the plants effluent would be delivered to IID's distribution system at the Central Canal located 3.5 miles west of the proposed plant.

Recycled Water Alternative 6 would yield 16,808 AFY. It is technically feasible and the cost, at $4,888 per AF, is within the cost limits developed for this investigation. It will be carried forward for further investigation.

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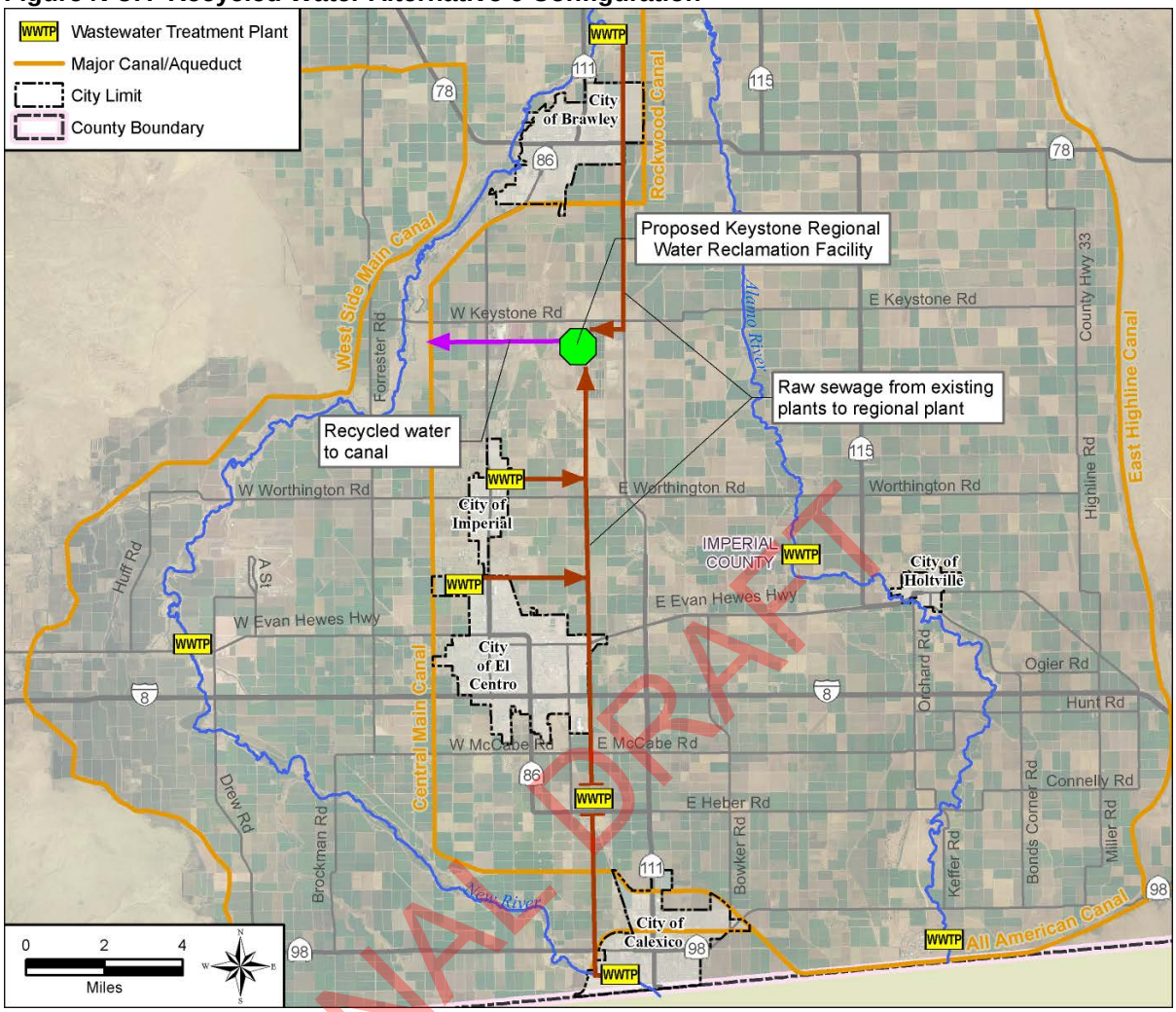
Figure N-37. Recycled Water Alternative 6 Configuration



Cost

Recycled Water Alternative 6 has an estimated capital cost of $102 million. This capital cost is dominated by the cost of force mains to deliver raw sewage from the existing plants to the regional plant. Recycled Water Alternative 4's extensive recycled conveyance system is not needed. The system would deliver 16,800 AFY of recycled water at an equivalent annual cost of $488 per acre-foot. Table N-31 gives a more detailed cost estimate.

Table N-31. Recycled Water Alternative 6 – Keystone Regional Water Reclamation Plant delivering to Central Canal (May 2009 price level, 4% real interest rate, 30-year project life)

Capital Cost		
Tertiary Treatment (15MGD. Cost over secondary)	$	24,841,252
Sewer Lift Station, Brawley to Keystone, 4 @ 300 hp incl standby		1,298,700
Sewer Lift Station, Imperial to Keystone, 3 @ 40 hp incl standby		518,388
Sewer Lift Station, El Centro to Keystone, 3 @ 40 hp incl standby		518,388
Sewer Lift Station, Calexico to Keystone, 6 @ 200 hp incl standby		1,469,052
Pumping Facilities for recycled system, 3 @ 100 including standby		664,279
Force Main, Brawley to Keystone		22,228,982
Force Main, Calexico, Cl Centro & Imperial to Keystone		42,146,454
Pipeline to Canal		5,517,832
Turnout to canal		93,600
Mitigation Costs (reduced drain flows)		3,077,927
Capital Cost	$	102,374,854
O&M Costs		
O&M Costs	$	2,280,145
Financial Analysis (4%, 30 years)		
Equivalent Annual Cost		$8,200,493
Yield (AFY)		16,808
Equivalent Annual Cost per acre-foot		**$488**

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N.3.2.7 Other Projects

In addition to the project alternatives presented and evaluated above there are a number of other opportunities that could be considered in the area. Potential projects include those that may have been identified on an informal level by cities or power plant owners as well as some opportunities that may not have been considered and were outside the scope of this report; such as grey water.

Existing Plants

While no plants within IID currently have any land disposal or reuse, increased emphasis by the RWQCB, along with the UWMP requirements and increasing limitations to IID supplies, may make recycled water a cost effective alternative. Interviews with the wastewater treatment plant operators or representatives indicate that several plants have been approached with ideas or have begun internal discussions of potential recycled water projects.

A number of plants, including the City of Calexico Municipal WWTP, the City of El Centro Municipal WWTP, and City of Holtville Municipal WTTP, mentioned consideration of crop or surrounding area irrigation, some possibly at current treatment levels. Specifically, a study evaluating the tie in of a CHP facility to the Gateway of the Americas WWTP included consideration for using reclaimed water for the irrigation at the CHP facility. Additionally, the City of Brawley's website specifically indicates that the feasibility of using recycled water on a golf course south of the Brawley WWTP is being evaluated.

Several plants have also had interest expressed by various industrial water consumers. As included in the alternatives consideration discussion, the City of Brawley is negotiating with Ormat Nevada, Inc. Ormat approached the city for reclaimed use for cooling tower purposes at a new/expanded plant. The preliminary design report on reclaimed water structures has been started. The Heber PUD WWTP is also in discussion with Ormat regarding use of reclaimed water. Additionally, the City of Brawley has had Caltrans and an ethanol plant planned nearby expressed some interest in the use of recycled water. The Calipatria WWTP indicated they also had discussion with an ethanol plant at one point. Modern ethanol plants have refined water treatment techniques to enable recycling of water to boilers and these treatment techniques typically also enable the plants to use lower quality water such as sewage treatment plant effluents. A potential solar farm has also contacted at least two of the area plants, the Westmoreland WWTP and the Seeley County WWTP.

In the interviews all of the plants operators or representatives spoken with could identify a potential market for recycled water from their plant even if the options were not actively being pursued or discussed. Most indicated that they expected more recycled water in the area eventually, some anticipate it in the near future. There appears to be increased focus on recycled water opportunities with increased emphasis by the RWQCB, along with the UWMP requirements and increasing limitations to IID supplies. As an example, Niland WWTP indicated that when the Region Board last visited they recommended evaluating reuse opportunities.

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Geothermal Plants

There are also several geothermal plants in the area that are treating cooling water and disposing with NPDES permits. These plants may have opportunities to provide a cost effective source of recycled water supply. One plant, the IID's El Centro Generating Station, has a NPDES permit and a RWQCB order to install RO to treat up to 1,200 AFY.

Grey water

Grey water is household wastewater from sinks, showers, and washer machines, which can be reused for watering plants and flushing toilets. A simple example of reuse of grey water is a homeowner using water from his washing machine or shower for irrigation or to flush a toilet. Depending on the systems used, grey water systems could recycle water without building public infrastructure.

"Scalper" plants

The construction of small recycling plants located in the upper portion of a wastewater service area can have some advantages over recycling at a larger, central wastewater plant. There may be a location that balances the supply of sewage with the demand for recycled water. With the proper location, the cost of the recycled water distribution system is controlled. Also, the new plant may allow downsizing sewer trunk lines or defer their replacement. This is somewhat similar to Recycled Water Alternative 2.

N.3.2.8 Next steps

This investigation has developed conceptual level alternatives based on limited information. Based on this data the cost of recycled water may vary from $170/acre-feet for secondary recycled water delivered to farm land to a thousand dollars for tertiary water delivered to municipal and industrial users. But, this has been a conceptual analysis with a great deal of uncertainty. Decisions to eliminate or further evaluate these alternatives should consider the following assumptions and limitation on the analysis. They should also be considered in the scoping of additional investigations.

There has been limited discussion with the operators of the wastewater plants and none with the potential customers:

- The use of recycled water often presents water quality challenges for the customers. With these projects in particular, salt levels may be a concern. As a rule of thumb, wastewater treatment plant effluent has 300 ppm more TDS than the treated water used in the plants service area. Without desalting, effluent in the IID area may be in the range of 1,000 ppm TDS. This level will affect agricultural and other uses of the recycled water and create costs for those users. High organics are also a concern for customers (See the earlier discussion of Ormat Technologies investigations of reusing effluent from the Brawley WWTP).

- Users may face challenges with the perceptions created by use of recycled water. The agency implementing the recycled water system and the potential users will have to work together to achieve a successful program. Agreements with growers to take the water would be needed. The acceptability of deliveries secondary treated wastewater to even a limited reach of canal (Recycled Water Alternative 1, Brawley WWTP, Recycled Water Alternatives 3,5, and 6) needs to be further examined. Use of recycled water on farmland may require IID acquiring the farm land and then leasing it with restrictions.

- There may be additional markets that have not been identified, which substantially reduce the alternatives costs. An example might be a proposed geothermal plant in the South Brawley KGRA that could receive recycled water from the regional plant proposed in Recycled Water Alternatives 4, 5, and 6. Little is known about Ormat Technologies concepts and analysis for using effluent from the Brawly WWTP.

- The proposed markets for an alternative may not exist. For example, the arrangement of facilities at a park or at a school may make use of recycled water unfeasible.

- Alternatives delivering recycled water to municipal and industrial customers (Recycled Water Alternatives 2 and 4) would require the cooperation of the relevant land use entities.

- In light of increased interest in conservation, the supply and quality of plant effluent available for recycling may reduce in the future. Conservation may reduce the market for recycled water. Conservation may increase TDS levels in effluent.

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Delivering recycled water to IID's Distribution System may not be acceptable:

- Recycled Water Alternatives 3, 5, and 6 propose delivering tertiary-treated recycled water to IID's Distribution System. This may not be acceptable for regulatory reasons, water quality reasons or to the users of water delivered from the system.

The estimates of the cost of additional treatment are based on generic data:

- Cost estimates for upgrading treatment to tertiary are based on generic curves that may not be applicable to these cases.

- This investigation assumed that the market for recycled water would be present immediately upon completion of the development of the supply and the conveyance system. Experience on many existing recycled water projects indicates that this typically is not the case. This concern is particularly true for Recycled Water Alternatives 4, 5, and 6, which envision development of a new plant to provide wastewater treatment for future development and deliver recycled water to future development (Recycled Water Alternative 6 serves the recycled water to existing development).

- Other water management strategies impact the feasibility of recycled water. Urban conservation reduces the amount of sewage and increases the TDS levels in that sewage. Urban conservation can also reduce the market for recycled water.

The feasibility of abandoning local wastewater treatment plants for a regional plant has not been evaluated with the owners of those plants

- It is known that the City of Imperial is interested in abandoning their plant because of land use considerations.

- Brawley is about to make a major investment in their wastewater treatment plant. It may not be acceptable to abandon a new plant.

Equity issues have not been addressed in this investigation

- Who should pay for a project and on what basis has not been addressed. Do new users pay the cost of new water? Do all stakeholders in IID's supply pay proportionally to their water use? Do municipal and industrial users pay the cost of on-site conversions?

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IMPERIAL IRWMP

INTEGRATED REGIONAL WATER MANAGEMENT PLAN

GEI Consultants

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Appendix J: 2015 IID QSA Implementation Report

City of Calexico 2015 Urban Water Management Plan

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IMPERIAL IRRIGATION DISTRICT

QUANTIFICATION SETTLEMENT AGREEMENT

IMPLEMENTATION REPORT

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Simply put, the Colorado River – which supplies one quarter of Southern California's freshwater supply for agricultural production, urban growth and environmental purposes – is under tremendous stress.

For the past 16 years the Lower Colorado River Basin has been suffering through its own drought (in addition to five years of drought across California), and yet, the needs of its regional water users continue to be met largely due to the effective implementation of the state's plan to utilize and distribute its Colorado River water supply.

With more than a decade of water levels at lakes Mead and Powell significantly dropping and upper basin snowpack falling below average, the likelihood of a shortage being declared on the river in the near term if conditions do not improve is increasing. Effective implementation of the terms of the Quantification Settlement Agreement has been essential to avoid this operating condition in recent years.

With water rights to the largest annual consumptive use entitlement of Colorado River water among the Lower Basin states (3.1 million acre-feet), Imperial Irrigation District's water conservation efforts are paramount to maintaining agricultural production and generating conserved water for dry Southern California.

While providing more than 95 percent of its water to grow food and fiber for the nation, supporting agriculture and driving local, regional and state economies during the worst droughts in history, IID continues to increase the annual volume of water the district is conserving for transfer to Southern California and to supply mitigation water for the Salton Sea.

At full implementation of QSA conservation measures, the district will conserve more than 487,000 acre-feet of water annually, the largest volumes coming from water for transfer to San Diego, to the Metropolitan Water District of Southern California and to the Coachella Valley (200,000, 105,000 and 103,000 acre-feet respectfully).

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Overwhelming support was received for the on-farm efficiency conservation program as farmers created over 25,000 acre-feet of excess on-farm conservation for storage. In total, 38,313 acre-feet was created for storage, the balance coming from the 12-hour delivery program and seepage interceptor projects. Imperial Valley growers have been helpful in identifying extraordinary conservation measures and are using more sprinkler, drip irrigation and pumping methods and 12-hour water orders to generate additional conserved water.

To conserve water throughout the delivery system, the district has initiated several capital improvement projects, building a number of interties along major canals and kicked off planning efforts to double its operational reservoir capacity through the development of more system reservoirs. IID carefully manages multiple projects to upgrade the water delivery system to generate conserved water, while providing operational flexibility to growers to support their overall conservation.

In addition to its scheduled conservation measures, the fallowing program generated nearly 44,000 acre-feet of excess conservation in 2015. This water was delivered to the Salton Sea as early mitigation water in support of the water transfer and to cover exposed playa to address air quality concerns at the sea – a body of water that has received increased attention during the drought and faces a crisis when scheduled mitigation deliveries end after 2017.

Further, in the spirit of cooperation, the district entered into an amendment to the California intentionally created surplus storage agreement with the California water agencies agreeing to a three-year period that IID could store additional excess intentionally created surplus water in the Metropolitan Water District of Southern California system. This storage alternative supplements the limited conservation methodologies and volumetric limitations currently imposed on IID by Lake Mead's storage policies that preclude the storage of conserved water created from most efficiency conservation measures. The amendment provides more flexibility for IID to bank water created by on-farm and other system efficiency conservation measures, helping MWD during the drought and providing operational flexibility for IID in future years.

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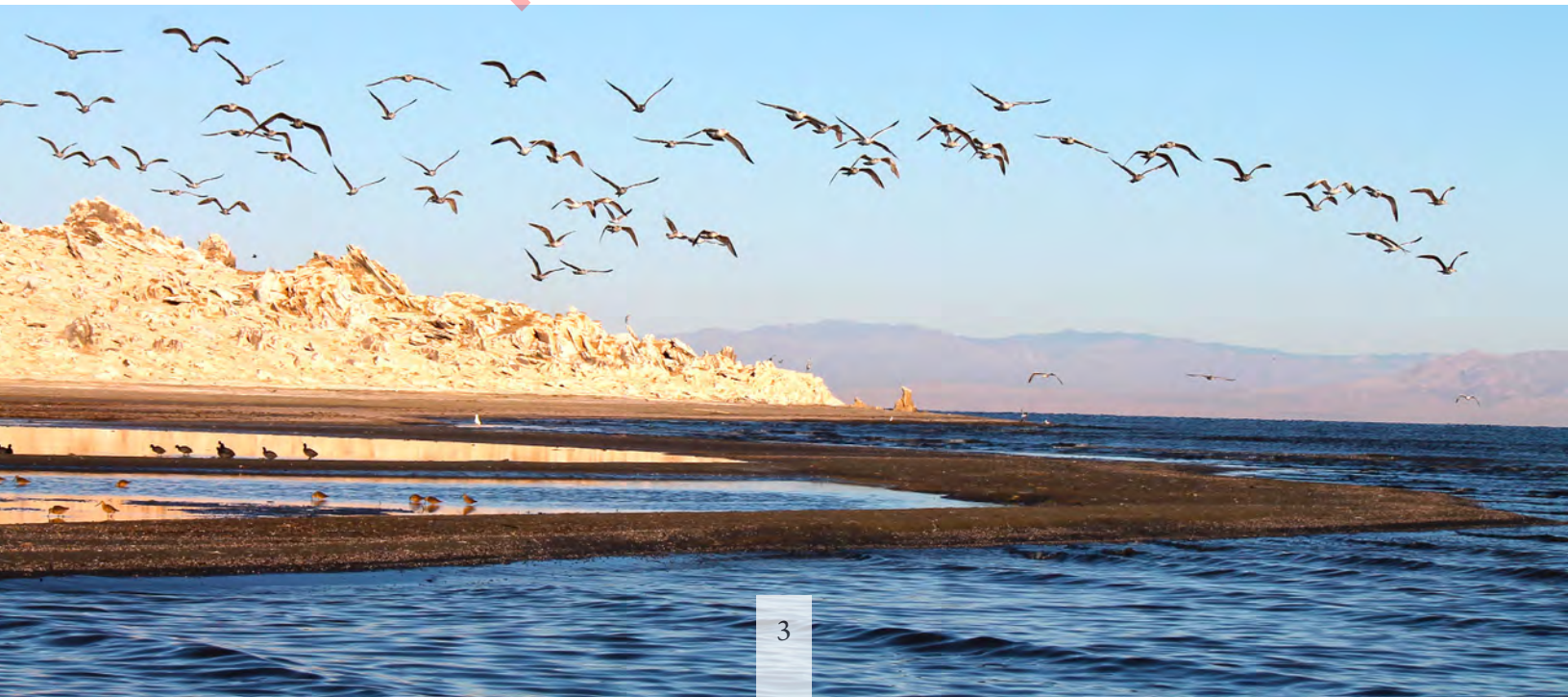

With the end of land fallowing and the completion of Salton Sea mitigation deliveries approaching and efficiency-based conservation programs ramping up, IID remains committed to meeting the conservation and transfer terms of the nation's largest ag-to-urban water transfer agreement. Yet, as time marches on, a critical component to the on-going success of IID's conserved water transfers, and a precursor to the district's ability to participate in future drought contingency planning efforts, is certainty regarding the state's Salton Sea restoration obligations.

Though the future looms large in the hearts and minds of those living in the region who will be most impacted by degraded air quality after mitigation deliveries end and Salton Sea playa begins to be rapidly exposed, the district remains hopeful that action to address public and environmental impacts will be developed.

In 2015, public comments regarding the potential air quality and environmental concerns at the sea after the transfer's mitigation water ends was widespread and followed by a multi-agency Salton Sea Task Force formed by the governor to seek input and develop recommendations for a restoration plan.

IID, in cooperation with Imperial County, also released its draft Salton Sea Restoration and Renewable Energy Initiative Framework to initiate a dialogue about sea restoration to maintain the security of California's Colorado River water supply, address Salton Sea public health and environmental concerns and support the state's renewable energy objectives.

California responded, announcing task force actions, which include creation of 25,000 acres of playa-based habitat and air quality projects by 2025 to address declining elevation and evaluation of renewable energy development at the sea.

IID's petition to the California State Water Resources Control Board (2014) has given the Salton Sea a voice. With it, the district will continue to seek answers to the complex problems posed by the Salton Sea and its role as part of the Lower Colorado River system.

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Water Accounting

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ANNUAL WATER ACCOUNTING SUMMARY

All values are provisional consumptive use volume in acre-feet at Imperial Dam

Year	Misc PPRs	Conserved Water								
		IID/MWD Efficiency (1988 Agreement)	All-American Canal Lining	San Diego County Water Authority Conservation	Salton Sea Mitigation Conservation	Exhibit C Payback Conservation	IOPP Conservation Payback	ICS Conservation	Coachella Valley Water District Conservation	Total Conservation
2003	11,500	105,130	--	3,445	0	0	--	--	0	108,575
2004	11,500	101,900	--	20,000	15,000	48,149	0	--	0	185,049
2005	11,500	101,940	--	30,000	15,000	31,266	0	--	0	178,206
2006	11,500	101,160	--	40,000	20,000	37,154	0	1,000	0	199,314
2007	11,500	105,000	--	50,000	25,021	34,831	1,263	0	0	216,115
2008	11,500	105,000	8,898	50,000	26,085	0	16,197	0	4,000	210,180
2009	11,126	105,000	65,577	60,000	30,133	0	0	13,797	8,000	282,507
2010	11,500	105,000	67,700	70,000	33,761	0	0	0	6,809	283,270
2011	11,500	103,940	67,700	63,278	0	0	0	10,528	16,000	261,446
2012	11,500	104,140	67,700	106,722	15,182	0	14,299	0	21,000	329,043
2013	11,500	105,000	67,700	100,000	71,398	0	93,057	0	26,000	463,155
2014	11,500	104,100	67,700	100,000	89,168	0	117,391	37,735	31,000	547,094
2015	11,500	107,820	67,700	100,000	153,327	0	0	38,313	36,000	503,160
2016										
2017										
Total	**149,126**	**1,355,130**	**480,675**	**793,445**	**494,075**	**151,400**	**242,207**	**101,373**	**148,809**	**3,767,114**

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2015 IID WATER ACCOUNTING

All values are provisional consumptive use volume in acre-feet at Imperial Dam

	Consumptive Use	Fallowing	Efficiency	Salton Sea Delivery	Storage at Lake Mead	Storage at MWD
Miscellaneous Present Perfected Rights	11,500					
1988 IID/MWD Transfer	107,820		107,820			
SDCWA Transfer	100,000	40,000	60,000			
CVWD Transfer	36,000	4,157	31,843			
San Diego Transfer - Salton Sea Mitigation[1]	153,327	153,327		153,327		
Inadvertent Overrun Payback	0					
Intentionally Created Surplus	38,313		38,313			38,313
AAC Lining Project Transfer	67,700		67,700			
IID Water Users[2]	2,480,933					
LCWSP Wellfield Pumpage[3]	7,219					
Total	**3,002,812**	**197,484**	**305,676**	**153,327**	**0**	**38,313**
IID QSA Entitlement	3,100,000					
Inadvertent Overrun Reported by USBR	--					
Underrun	-97,188					

Notes:

1) Adjusted for excess conservation and delivery of 566 AF in 2014 and 43,893 AF in 2015 (110,000-566+43,893=153,327 AF). See Salton Sea Mitigation Accounting for details.

2) Draft USBR Water Accounting, 4/22/2016.

3) Included as part of IID's CU in lieu of an equivalent diversion.

2014 IID WATER ACCOUNTING

All values are provisional consumptive use volume in acre-feet at Imperial Dam

	Consumptive Use	Fallowing	Efficiency	Salton Sea Delivery	Storage at Lake Mead	Storage at MWD
Miscellaneous Present Perfected Rights	11,500					
1988 IID/MWD Transfer	104,100		104,100			
SDCWA Transfer	100,000	60,000	40,000			
CVWD Transfer	31,000		31,000			
San Diego Transfer - Salton Sea Mitigation[1]	89,168	89,168		89,168		
Inadvertent Overrun Payback	117,391	111,789	5,602		117,391	
Intentionally Created Surplus	37,735	37,735			18,867	18,868
AAC Lining Project Transfer	67,700		67,700			
IID Water Users[2]	2,533,414					
LCWSP Wellfield Pumpage[3]	7,195					
Total	**3,099,203**	**298,692**	**248,402**	**89,168**	**136,258**	**18,868**
IID QSA Entitlement	3,100,000					
Inadvertent Overrun Reported by USBR	--					
Underrun	-797					

Notes:

1) Adjusted for excess conservation and delivery of 1,398 AF in 2013 and 566 AF in 2014 (90,000-1,398+566=89,168 AF). See Salton Sea Mitigation Accounting for details.

2) USBR Decree Acocunting published 5/15/2015.

3) Included as part of IID's CU in lieu of an equivalent diversion.

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2013 IID WATER ACCOUNTING

All values are provisional consumptive use volume in acre-feet at Imperial Dam

	Consumptive Use	Fallowing	Efficiency	Salton Sea Delivery	Storage at Lake Mead
Miscellaneous Present Perfected Rights	11,500				
1988 IID/MWD Transfer	105,000		105,000		
SDCWA Transfer	100,000	80,000	20,000		
CVWD Transfer	26,000		26,000		
San Diego Transfer - Salton Sea Mitigation[1]	71,398	71,398		71,470	-72
Inadvertent Overrun Payback[2]	93,057	91,005	2,052		93,057
Intentionally Created Surplus	0				
AAC Lining Project Transfer	67,700		67,700		
IID Water Users[3]	2,554,854				
LCWSP Wellfield Pumpage	5,510				
Total	**3,035,019**	**242,403**	**220,752**		
IID QSA Entitlement	3,100,000				
Inadvertent Overrun Reported by USBR	--				
Underrun	-64,981				

Notes:

1) Excess fallow and delivery of 1,398 AF (1,470 AF adjusted for 2012 underdelivery of 72AF). See Salton Sea Mitigation Accounting for details.

2) 37,347 AF applied as early Inadvertent Overrun Payback.

3) USBR reported value as per Decree Accounting records published May 2014.

2012 IID WATER ACCOUNTING

All values are provisional consumptive use volume in acre-feet at Imperial Dam

	Consumptive Use	Fallowing	Efficiency	Salton Sea Delivery	Storage at Lake Mead
Miscellaneous Present Perfected Rights	11,500				
1988 IID/MWD Transfer[1]	104,140		104,140		
SDCWA Transfer[2]	106,722	106,722			
CVWD Transfer	21,000		21,000		
San Diego Transfer - Salton Sea Mitigation[4]	15,182	15,182		15,110	72[3]
Inadvertent Overrun Payback[5]	0				5,842
Intentionally Created Surplus	0				
AAC Lining Project Transfer	67,700		67,700		
IID Water Users[6]	2,903,216				
LCWSP Wellfield Pumpage	4,616				
IID Additional Conserved Water & Storage[7]	14,299	3,411	10,888		
Total	**3,248,375**	**125,315**	**203,728**	**15,110**	**5,914**
IID QSA Entitlement	3,100,000				
Amount Exceeding Approved Water Order	148,375				
EOY Inadvertent Overrun Reported by USBR[7,8]	134,076				
Underrun	--				

Notes:

1) *Reduced as per Agreement due to reduction in number of required Tailwater Return Systems.*
2) *Due to the risk associated with QSA litigation, IID was able to create only 63,278 AF of the required 80,000 AF by fallowing in calendar year 2011. The balance of 16,722 AF of fallowed water, while under contract in the 2011-2012 Fallowing Program, was conserved in calendar year 2012. While IID considers the 16,722 AF to have been transferred by utilization of IID's IOPP right in calendar year 2011, to satisfy accounting deadlines, IID agreed to transfer 106,722 AF of conserved water instead of 90,000 AF in calendar year 2012; however IID reserves its position regarding the utilization of its IOPP right for transfer shortfalls.*
3) *In 2012, IID conserved 15,182 AF of Colorado River water for Salton Sea mitigation purposes, but delivered 15,110 AF to the Sea. This resulted in a 72 AF under-delivery. In 2013, IID increased deliveries to the Salton Sea by 72 AF.*
4) *Remaining Salton Sea Mitigation balance of 19,879 AF from carryover of 2010 early mitigation water delivery - See SS Mitigation Accounting for details.*
5) *5,842 AF from ICS and 448 AF from CVWD groundwater storage (see IID's CVWD Groundwater Storage Accounting) used as early IOPP payback for 2011 overrun - See IOPP Accounting and Provisional Lake Mead Accounting for details.*
6) *USBR reported value as per Provisional Decree Accounting records dated May 2013*
7) *14,299 AF created for ICS purposes but due to policy limitations in overrun years, was used instead to reduce current year's overrun.*
8) *USBR reported overrun as per Final Decree Report records published May 2013.*

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2011 IID WATER ACCOUNTING

All values are provisional consumptive use volume in acre-feet at Imperial Dam

	Consumptive Use	Fallowing	Efficiency	Salton Sea Delivery	Storage at Lake Mead
Miscellaneous Present Perfected Rights	11,500				
1988 IID/MWD Transfer[1]	103,940		103,940		
SDCWA Transfer[2]	63,278	63,278			
CVWD Transfer	16,000		16,000		
San Diego Transfer - Salton Sea Mitigation[3]	0				
Inadvertent Overrun Payback	0				
Intentionally Created Surplus	0				
AAC Lining Project Transfer	67,700		67,700		
IID Water Users[4]	2,915,784				
LCWSP Wellfield Pumpage	4,460				
IID Additional Conserved Water & Storage[5]	10,528		10,528		
Total	**3,193,190**	**63,278**	**198,168**	**0**	**0**
IID QSA Entitlement	3,100,000				
Amount Exceeding Approved Water Order	93,190				
EOY Inadvertent Overrun Reported by USBR[5,6]	82,662				
Underrun	--				

Notes:

1) *Reduced as per Agreement due to reduction in number of required Tailwater Return Systems.*
2) *Due to the risk associated with QSA litigation, IID was able to create only 63,278 AF of the required 80,000 AF by fallowing in calendar year 2011. The balance of 16,722 AF of fallowed water, while under contract in the 2011-2012 Fallowing Program, was conserved in calendar year 2012. While IID considers the 16,722 AF to have been transferred by utilization of IID's IOPP right in calendar year 2011, to satisfy accounting deadlines, IID agreed to transfer 106,722 AF of conserved water instead of 90,000 AF in calendar year 2012; however IID reserves its position regarding the utilization of its IOPP right for transfer shortfalls.*
3) *Salton Sea Mitigation obligation of 40,000 AF from carryover of previous years deliveries - See SS Mitigation Accounting for details.*
4) *USBR reported value as per final Decree Accounting records published May 2012*
5) *10,528 AF created for ICS purposes but due to policy limitations in overrun years, was used instead to reduce current year's overrun.*
6) *USBR reported overrun as per final Decree Accounting records dated May 2012. Does not include IID's 16,722 AF conservation shortfall for SDCWA, which was transferred by use of IOPP - See SDCWA Transfer Accounting for details.*

2010 IID WATER ACCOUNTING

All values are provisional consumptive use volume in acre-feet at Imperial Dam

	Consumptive Use	Fallowing	Efficiency	Salton Sea Delivery	Storage at Lake Mead
Miscellaneous Present Perfected Rights	11,500				
1988 IID/MWD Transfer	105,000		105,000		
SDCWA Transfer	70,000	70,000			
CVWD Transfer	12,000		6,809[1]		5,191
San Diego Transfer - Salton Sea Mitigation	33,736	33,761		33,736[2]	25[3]
Inadvertent Overrun Payback	0				
Intentionally Created Surplus	0				
AAC Lining Project Transfer	67,700		67,700		
IID Water Users[4]	2,540,489				
LCWSP Wellfield Pumpage	5,104				
IID Storage	46,546			46,546[5]	
Total	**2,892,075**	**103,761**	**179,509**	**80,282**	**5,216**
IID QSA Entitlement	3,100,000				
Inadvertent Overrun Reported by USBR	--				
Underrun	207,925				

Notes:

1) *IID was able to create only 6,809 AF of the required 12,000 AF by efficiency conservation due to Main Canal Seepage Recovery pump outage problems; 5,191 AF delivered from IID's ICS account - See ICS Accounting.*
2) *Accounts for carryover Salton Sea Mitigation from previous years - See SS Accounting for Details.*
3) *Difference between 2009 SS mitigation delivery requirement and actual delivered and fallowed amount - See Mead Accounting for Details.*
4) *Reported IID C.U. from Colo. River by USBR (final decree accounting published May 2011), includes 526 AF delivered to Coachella Canal heading for groundwater storage.*
5) *Storage in Salton Sea for 2011 and one half of 2012 mitigation obligation.*

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2009 IID WATER ACCOUNTING

All values are provisional consumptive use volume in acre-feet at Imperial Dam

	Consumptive Use	Fallowing	Efficiency	Salton Sea Delivery	Storage at Lake Mead
Miscellaneous Present Pefected Rights	11,126				
1988 IID/MWD Transfer	105,000		105,000		
SDCWA Transfer	60,000	60,000			
CVWD Transfer	8,000		8,000		
San Diego Transfer - Salton Sea Mitigation	30,158	30,133		30,158	-25[1]
Inadvertent Overrun Payback	0				
Intentionally Created Surplus	12,000		13,797		12,000[2]
AAC Lining Project Transfer[3]	65,577		65,577		
IID Water Users[4]	2,566,713				
LCWSP Wellfield Pumpage	3,684				
Total	**2,862,258**	**90,133**	**192,374**	**30,158**	**11,975**
IID QSA Entitlement	3,100,000				
Inadvertent Overrun Reported by USBR	-				
Underrun	237,767				

Notes:

1) *Carried over to next year.*
2) *According to ICS policy, IID limited to 12,000 AF per year from seepage interception pumps; 1,797 AF created by seepage interception unused and left in Colorado River system.*
3) *2009 conservation yield for Reaches 1, 2, and 3 based on the Secretary of Interior's Oct. 27, 2009 Interim Determination and are 48,727 AF, 14,700 AF and 2,150 AF respectively.*
4) *Reported IID C.U. from Colo. River by USBR.*

2008 IID WATER ACCOUNTING

All values are provisional consumptive use volume in acre-feet at Imperial Dam

	Consumptive Use	Fallowing	Efficiency	Salton Sea Delivery	Storage at Lake Mead
Miscellaneous Present Pefected Rights	11,500				
1988 IID/MWD Transfer	105,000		105,000		
SDCWA Transfer	50,000	50,000			
CVWD Transfer	4,000		4,000		
San Diego Transfer - Salton Sea Mitigation	26,085	26,085		26,085	
Inadvertent Overrun Payback	16,197	11,965	4,232		16,197
Intentionally Created Surplus	0				
AAC Lining Project Transfer	8,898		8,898		
IID Water Users[1]	2,825,116				
LCWSP Wellfield Pumpage	7,350				
MWD diversion of IID early payback per settlement	-2,145				
Total	**3,052,001**	**88,050**	**122,130**	**26,085**	**16,176**
IID QSA Entitlement	3,100,000				
Inadvertent Overrun Reported by USBR	-				
Underrun	47,999				

Notes:

1) Reported IID C.U. from Colo. River by USBR.

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2007 IID WATER ACCOUNTING

All values are provisional consumptive use volume in acre-feet at Imperial Dam

	Consumptive Use	Fallowing	Efficiency	Salton Sea Delivery	Storage at Lake Mead
Miscellaneous Present Pefected Rights	11,500				
1988 IID/MWD Transfer	105,000		105,000		
SDCWA Transfer	50,000	50,000			
San Diego Transfer - Salton Sea Mitigation	25,021	25,021		23,306	2,356[1]
CRWDA Exhibit C Payback	18,900	18,900			18,900
Early CRWDA Exhibit C Payback	15,931	15,931			15,931
Intentionally Created Surplus	0				
Inadvertent Overrun Payback	1,263	1,263			1,263
IID Water Users[2]	2,872,754				
LCWSP Wellfield Pumpage	5,989				
Total	**3,106,358**	**111,115**	**105,000**	**23,306**	**38,450**
IID QSA Entitlement	3,100,000				
Inadvertent Overrun Reported by USBR	6,358				
Underrun	-				

Notes:

1) 1,715 AF from fallowing and 641 AF credit from 2004 - See Lake Mead Accounting

2) Reported IID C.U. from Colo. River by USBR.

2006 IID WATER ACCOUNTING

All values are provisional consumptive use volume in acre-feet at Imperial Dam

	Consumptive Use	Fallowing	Efficiency	Salton Sea Delivery	Storage at Lake Mead
Miscellaneous Present Pefected Rights	11,500				
1988 IID/MWD Transfer	101,160		101,160		
SDCWA Transfer	40,000	40,000			
San Diego Transfer - Salton Sea Mitigation	20,000	20,000			20,000[1]
CRWDA Exhibit C Payback	18,900	18,900			18,900
Early CRWDA Exhibit C Payback	18,719	18,719			18,719
Inadvertent Overrun Payback	0				1,000
Intentionally Created Surplus	1,000	1,000			0
IID Water Users[2]	2,909,680				
LCWSP Wellfield Pumpage	1,412				
Adjustments (USBR 2003-2006 Canal Loss, II B (6), ICS)	-9,957				
Total	**3,112,414**	**98,619**	**101,160**	**0**	**58,619**
IID QSA Entitlement	3,100,000				
Inadvertent Overrun Reported by USBR	12,414				
Underrun	-				

Notes:

1) Restoration of 2004 and 2005 reregulation conservation to Colo. River from Salton Sea.

2) Reported IID C.U. from Colo. River by USBR.

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2005 IID WATER ACCOUNTING

All values are provisional consumptive use volume in acre-feet at Imperial Dam

	Consumptive Use	Fallowing	Efficiency	Salton Sea Delivery	Storage at Lake Mead
Miscellaneous Present Pefected Rights	11,500				
1988 IID/MWD Transfer	101,940		101,940		
SDCWA Transfer	30,000	30,000			
San Diego Transfer - Salton Sea Mitigation	15,000	15,000			15,000[2]
CRWDA Exhibit C Payback	18,900	18,900			18,900
Early CRWDA Exhibit C Payback	7,305	7,305			7,305
Inadvertent Overrun Payback	0				
Colo. River Reregulation Conservation & Storage in SS[1]	0			21,476	
IID Water Users[3]	2,756,846				
LCWSP Wellfield Pumpage	1,036				
Total	**2,942,527**	**71,205**	**101,940**	**21,476**	**41,205**
IID QSA Entitlement	3,100,000				
Inadvertent Overrun Reported by USBR	-				
Underrun[4]	159,881				

Notes:

1) Per Agreement, IID is credited with 25% of Colo. River reregulation water stored in Salton Sea as a reduction to Exhibit C payback.

2) Restoration of 2004 reregulation conservation to Colo. River from Salton Sea.

3) Reported IID C.U. from Colo. River by USBR.

4) Does not include canal loss adjustment per 2006 IID/USBR Agreement

2004 IID WATER ACCOUNTING

All values are provisional consumptive use volume in acre-feet at Imperial Dam

	Consumptive Use	Fallowing	Efficiency	Salton Sea Delivery	Storage at Lake Mead
Miscellaneous Present Pefected Rights	11,500				
1988 IID/MWD Transfer	101,900		101,900		
SDCWA Transfer	20,000	20,000			
San Diego Transfer - Salton Sea Mitigation	15,000	15,000		14,359	641
CRWDA Exhibit C Payback	18,900	18,900			18,900
Early CRWDA Exhibit C Payback	25,881	25,881			25,881
Inadvertent Overrun Payback	0				
Colo. River Reregulation Conservation & Storage in SS[1]	0			15,880	
IID Water Users[2]	2,743,909				
LCWSP Wellfield Pumpage	1,259				
Total	**2,938,349**	**79,781**	**101,900**	**30,239**	**45,422**
IID QSA Entitlement	3,100,000				
Inadvertent Overrun Reported by USBR	-				
Underrun[3]	166,408				

Notes:

1) *Per Agreement, IID is credited with 25% of Colo. River reregulation water stored in Salton Sea as a reduction to Exhibit C payback.*
2) *Reported IID C.U. from Colo. River by USBR.*
3) *Does not include canal loss adjustment per 2006 IID/USBR Agreement.*

FINAL DRAFT

2003 IID WATER ACCOUNTING

All values are provisional consumptive use volume in acre-feet at Imperial Dam

	Consumptive Use	Fallowing	Efficiency	Salton Sea Delivery	Storage at Lake Mead
Miscellaneous Present Pefected Rights	11,500				
1988 IID/MWD Transfer	105,130		105,130		
SDCWA Transfer	10,000	3,445			
San Diego Transfer - Salton Sea Mitigation[2]	5,000				
CRWDA Exhibit C Payback	0				
Early CRWDA Exhibit C Payback	0				
Inadvertent Overrun Payback	0				
IID Water Users[1]	2,978,223				
LCWSP Wellfield Pumpage	1,249				
Total	**3,111,102**	**3,445**	**105,130**	**0**	**0**
IID QSA Entitlement	3,100,000				
Inadvertent Overrun Reported by USBR[2]	6,555				
Underrun	-				

Notes:

1) *Reported IID C.U. from Colo. River by USBR. Does not include canal loss adjustment per 2006 IID/USBR Agreement.*
2) *Since the QSA was executed in October of 2003, IID was able to only fallow 3,445 AF and therefore had an inadvertent overrun of 6,555 AF which was used to satisfy IID's 10,000 AF obligation to SDCWA. The USBR waived payback for 2003 overruns for all Lower Basin contractors as the IOPP did not take effect until January 1, 2004.*

SDCWA TRANSFER ACCOUNTING

All values are provisional consumptive use volume in acre-feet at Imperial Dam

Year	Obligation	Fallowing	Efficiency	Total Volume	Annual Over/Under Obligation
2003[1]	10,000	3,445	0	3,445	-6,555
2004	20,000	20,000	0	20,000	0
2005	30,000	30,000	0	30,000	0
2006	40,000	40,000	0	40,000	0
2007	50,000	50,000	0	50,000	0
2008	50,000	50,000	0	50,000	0
2009	60,000	60,000	0	60,000	0
2010	70,000	70,000	0	70,000	0
2011[2]	80,000	63,278	0	63,278	-16,722
2012[2]	90,000	106,722	0	106,722	16,722
2013	100,000	80,000	20,000	100,000	0
2014	100,000	60,000	40,000	100,000	0
2015	100,000	40,000	60,000	100,000	0
2016	100,000				
2017	100,000				
Total	**1,000,000**	**673,445**	**120,000**	**793,445**	

Notes:

1) *Since the QSA was executed in October of 2003, IID was only able to fallow 3,445 AF and therefore had an inadvertent overrun of 6,555 AF which was used to satisfy IID's 10,000 AF obligation to SDCWA. The USBR waived payback for 2003 overruns for all Lower Basin entities.*

2) *Due to the risk associated with QSA litigation, IID was able to create only 63,278 AF of the required 80,000 AF by fallowing in calendar year 2011. The balance of 16,722 AF of fallowed water, while under contract in the 2011-2012 Fallowing Program, was conserved in calendar year 2012. While IID considers the 16,722 AF to have been transferred by utilization of IID's IOPP right in calendar year 2011, to satisfy accounting deadlines, IID agreed to transfer 106,722 AF of conserved water instead of 90,000 AF in calendar year 2012; however IID reserves its position regarding the utilization of its IOPP right for transfer shortfalls.*

FINAL DRAFT

CVWD TRANSFER ACCOUNTING

All values are provisional consumptive use volume in acre-feet at Imperial Dam

Year	Obligation	Fallowing	Efficiency	Total Volume	Annual Over/Under Obligation
2003	0	0	0	0	0
2004	0	0	0	0	0
2005	0	0	0	0	0
2006	0	0	0	0	0
2007	0	0	0	0	0
2008	4,000	0	4,000	4,000	0
2009	8,000	0	8,000	8,000	0
2010	12,000	0	12,000[1]	12,000	0
2011	16,000	0	16,000	16,000	0
2012	21,000	0	21,000	21,000	0
2013	26,000	0	26,000	26,000	0
2014	31,000	0	31,000	31,000	0
2015	36,000	4,157	31,843	36,000	0
2016	41,000				
2017	45,000				
Total	**240,000**	**4,157**	**149,843**	**154,000**	

Notes:

1) *6,809 AF created by Main Canal Seepage Recovery Project and 5,191 AF delivered from IID's ICS account - See ICS Accounting.*

SALTON SEA MITIGATION ACCOUNTING

All values are provisional consumptive use volume in acre-feet at Imperial Dam

Year	Obligation			Delivery to Sea				Inflow/Outflow	
	Fallow	Fallow (revised)	Entitlement	Delivery to Sea	CR Rereg Conservation & Storage	Total Volume	Remaining Obligation Balance	Annual Over/Under Obligation	Running Balance in Salton Sea
2003[1]	5,000			0	0	0	725,182	-5,000	-5,000
2004	10,000			14,359	15,880	30,239	715,182	20,239	15,239
2005	15,000			0	21,476	21,476	700,182	6,476	21,715
2006	20,000			0	0	0	680,182	-20,000	1,715
2007	25,000			23,306	0	23,306	655,182	-1,694	21
2008	25,000			26,085	0	26,085	630,182	1,085	1,106
2009	30,000			30,158	0	30,158	600,182	158	1,264
2010[2]	35,000			80,282	0	80,282	565,182	45,282	46,546
2011[3]	~~40,000~~	0	26,667	0	0	0	565,182	-26,667	19,879
2012[4]	~~45,000~~	15,182	19,879	15,110	0	15,110	550,000	-19,951	-72
2013	70,000			71,470	0	71,470	480,000	1,470	1,398
2014	90,000			89,168	0	89,168	390,000	-832	566
2015	110,000			153,327	0	153,327	236,673	43,327	43,893
2016	130,000								
2017	150,000								
Total[5]	**730,182**		**46,546**	**503,265**	**37,356**	**540,621**			

Notes:

1) *Since the QSA was executed in October of 2003, SWRCB approved the 2003 obligation being satisfied in 2004.*
2) *46,521 AF of IID's entitlement water was delivered to the Salton Sea for storage as early mitigation water in 2010 for the scheduled obligations of 2011 and half of 2012.*
3) *IID delivered entitlement water to the Salton Sea in 2010 for storage to be used for future mitigation. When entitlement water is used to mitigate transferred water created by fallowing, the transferred volume is multiplied by 1/3 to determine the entitlement water mitigation volume (i.e., 80,000 AF x .33 = 26,667 AF).*
4) *19,879 AF of entitlement water (see footnote 3) accounted for 66.3% of the 2012 Salton Sea obligation. The remaining 33.7% of the 2012 Salton Sea obligation totaled 15,182 AF from fallowing.*
5) *Due to use of entitlement water, adjustments have been made to the total obligation.*

FINAL DRAFT

CRWDA EXHIBIT C ACCOUNTING

All values are provisional consumptive use volume in acre-feet at Imperial Dam

Year	Obligation	Payback					Exhibit C Delivery Difference (Early Payback)		Adjusted Exhibit C Obligation
		Fallowing	Adjustment for USBR/IID 2007 Canal Loss Compromise Agreement	CR Rereg Conservation & Storage[1]	Total Volume	Remaining Balance	Annual Over/Under Obligation	Running Balance	
2003	0	0		0	0	151,400	0	0	0
2004	18,900	44,781	-602	3,970	48,149	103,251	29,249	29,249	0
2005	18,900	26,205	-308	5,369	31,266	71,985	12,366	41,615	0
2006	18,900	37,619	-465	0	37,154	34,831	18,254	59,869	0
2007	18,900	34,831	0	0	34,831	0[2]	15,931	75,800	0
2008	18,900	0	0	0	0	0			0
2009	18,900	0	0	0	0	0			0
2010	19,000	0	0	0	0	0			0
2011	19,000	0	0	0	0	0			0
Total	**151,400**	**143,436**	**-1,375**	**9,339**	**151,400**	**0**			

Notes:

1) *Per Agreement, IID is credited with 25% of Colo. River reregulation water stored in Salton Sea as a reduction to Exhibit C payback.*
2) *Total obligation of 151,400 AF completed four years early in 2007.*

IID'S CVWD GROUNDWATER STORAGE ACCOUNTING

All values are provisional consumptive use volume in acre-feet at Imperial Dam

Year	IID Water Delivered to CVWD MP 0.2 Turnout	5% Canal Conveyance Losses	5% Storage Losses	Amount Withdrawn	Net IID Water Stored as of Jan 1 following year
2003	0	0	0	0	0
2004	0	0	0	0	0
2005	0	0	0	0	0
2006	0	0	0	0	0
2007	0	0	0	0	0
2008	0	0	0	0	0
2009	0	0	0	0	0
2010	525	25	6	0	494
2011	0	0	25	0	469
2012	0	0	21	448	0
2013	0	0	0	0	0
2014	0	0	0	0	0
2015	0	0	0	0	0
2016					
2017					
Total	**525**	**25**	**52**	**448**	

FINAL DRAFT

IID INADVERTENT OVERRUN PAYBACK ACCOUNTING

All values are provisional consumptive use volume in acre-feet at Imperial Dam

Year	Inadvertent Overrun	Other Applied to IOP	ICS Applied to IOP	Fallowed Amount Applied to IOP	Efficiency Applied to IOP	Cumulative Remaining Inadvertent Overrun Balance
2003	--	--	--	--	--	--
2004	0	0	0	0	0	0
2005	0	0	0	0	0	0
2006	18,914	8,957[1]	1,000	0	0	8,957
2007	6,358	0	0	1,263	0	14,052
2008	0	0	0	11,965	4,232	0[2]
2009	0	0	0	0	0	0
2010	5,191[3]	0	5,191	0	0	0
2011[4]	--	0	0	0	0	82,662
2012[5]	134,076	448	5,842	0	0	210,448
2013	0	0	0	91,005	2,052	117,391
2014	0	0	0	111,789	5,602	0
2015	0	0	0	0	0	0
2016						
2017						
Total	**247,201**	**8,957**	**12,033**	**216,022**	**11,886**	

Notes:

1) *II B (6) Applied to IOP*
2) *MWD diverted 2,145 AF of IID early payback per settlement agreement dated 08/10/2009.*
3) *IID was able to create only 6,809 AF of the required 12,000 AF by efficiency conservation due to Main Canal Seepage Recovery Project pump outage problems; balance was delivered from IID's ICS account.*
4) *USBR reported overrun as 82,662 AF, which does not include the conservation shortfall of 16,722 AF that was delivered using the IOPP - See SDCWA Transfer Accounting for details.*
5) *5,842 AF from ICS and 448 AF from CVWD groundwater storage (See 2010 IID Water Use footnote 4) applied as 2011 overrun early payback, reducing the balance to 76,372 AF (See IID's letter to USBR dated 12/27/2012).*

IID INTENTIONALLY CREATED SURPLUS ACCOUNTING

All values are provisional consumptive use volume in acre-feet at Imperial Dam

Year	Fallowed	Seepage Interception	Other Qualified Efficiency	Total	Lake Mead ICS Storage					MWD ICS Storage								Total Year End Storage Balance
					2007 Interim Guidelines					2007 California ICS Agreement			Amendment 1				Year End Storage Balance	
					Delivered to Storage	Introduction Loss (5%)	Delivered from Storage	Annual Carry Over Loss (3%)	Year End Storage Balance	Delivered to Storage	Introduction Loss (10%)	Delivered from Storage	Delivered to Storage	Introduction Loss (5%)	Delivered from Storage	Annual Carry Over Loss (3%)		
2003	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2004	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2005	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2006[1]	1,000	0	0	1,000	1,000	0[1]	1,000	0	0	0	0	0	--	--	--	--	0	0
2007	0	0	0	0	0	0	0	0	0	0	0	0	--	--	--	--	0	0
2008	0	0	0	0	0	0	0	0	0	0	0	0	--	--	--	--	0	0
2009	0	13,797[2]	0	12,000	12,000	600	0	0	11,400	0	0	0	--	--	--	--	0	11,400
2010	0	0	0	0	0	0	5,191[3]	186	6,023	0	0	0	--	--	--	--	0	6,023
2011[4]	0	10,528	0	0	0	0	0	181	5,842	0	0	0	--	--	--	--	0	5,842
2012[5]	0	14,299	0	0	0	0	5,842[6]	0	0	0	0	0	--	--	--	--	0	0
2013	0	0	0	0	0	0	0	0	0	0	0	0	--	--	--	--	0	0
2014	37,735	0	0	37,735	18,867	943	0	0	17,924	18,868	1,887	0	--	--	--	--	16,981	34,905
2015[7]	0	12,000	26,313	38,313	0	0	0	538	17,386	25,000	2,500	0	13,313	666	0	0	52,128	69,514
2016																		
2017																		
Total	**38,735**	**38,624**	**26,313**	**89,048**	**31,867**	**1,543**	**12,033**	**905**		**43,868**	**4,387**	**0**	**13,313**	**666**	**0**	**0**		

Notes:

1) *2006 ICS was created for the Demonstration ICS Program but used for early payback of Inadvertent Overrun. ICS Policy was adopted in December of 2007.*
2) *According to ICS policy, IID is limited to 12,000 AF per year from seepage interception pumps-1,797 AF created by seepage interception unused and left in Colorado River system.*
3) *IID was able to create only 6,809 AF of the required 12,000 AF by efficiency conservation due to Main Canal Seepage Recovery pump outage problems; 5,191 AF delivered from IID's ICS account.*
4) *10,528 AF created for ICS purposes but due to policy limitations in overrun years was used instead to reduce current year's overrun.*
5) *14,299 AF created for ICS purposes but due to policy limitations in overrun years was used instead to reduce current year's overrun.*
6) *Early IOPP payback for 2011 overrun - See IOPP Accounting.*
7) *The first 25,000 AF of storage delivered under the 2007 California ICS Agreement created using 12,315 AF tailwater return systems, 12,000 AF seepage interception, and 685 AF 12-hour delivery system conservation.*

FINAL DRAFT

IID LAKE MEAD ACCOUNTING

All values are provisional consumptive use volume in acre-feet at Imperial Dam

Year	IOPP			ICS				Salton Sea Mitigation		CR Rereg Conservation & Storage				Total Balance
	Inadvertent Overrun	Payback	Balance	Created	Delivered	Losses	Balance	Remaining in Lake Mead	Balance	Payback	Diverted To SS	Over/Under	Balance	Annual
2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	641	641	0	15,880	-15,880	-15,880	-15,239
2005	0	0	0	0	0	0	0	0	641	15,000	21,476	-6,476	-22,356	-21,715
2006	18,914	9,957[1]	-8,950	1,000	1,000	0	0	0	641	20,000	0	20,000	-2,356	-10,665
2007	6,358	1,263	-14,045	0	0	0	0	-641	0	2,356	0	2,356	0	-14,045
2008	0	16,197	2,145[2]	0	0	0	0	0	0	0	0	0	0	0
2009	0	0	1,797[3]	12,000	0	600	11,400	-25	-25	0	0	0	0	11,375
2010	5,191	5,191[4]	0	0	5,191	186	6,023	25	0	0	0	0	0	6,023
2011[5]	82,662	0	-82,662	0[6]	0	181	5,842	0	0	0	0	0	0	-76,820
2012	134,076	6,290	-210,448	0[7]	5,842	0	0	72	72	0	0	0	0	-210,376
2013	0	93,057	-117,391	0	0	0	0	-72	0	0	0	0	0	-117,391
2014	0	117,391	0	18,867	0	943	17,924	0	0	0	0	0	0	17,924
2015	0	0	0	0	0	538	17,386	0	0	0	0	0	0	17,386
2016														
2017														
Total	**247,201**	**131,955**		**31,867**	**12,033**	**2,448**		**0**		**37,356**	**37,356**	**0**		

Notes:

1) *Includes 1,000 AF from ICS and 8,957 AF from II (B) 6.*
2) *MWD diverted 2,145 AF of IID early payback per settlement agreement dated 08/10/2009.*
3) *Additional water created by efficiency conservation left in Colo. River System as early payback and lost to IID.*
4) *IID was able to create only 6,809 AF of the required 12,000 AF by efficiency conservation due to Main Canal Seepage Recovery pump outage problems; 5,191 AF delivered from IID's ICS account - See ICS Accounting.*
5) *USBR reported overrun as 82,662 AF. A conservation shortfall of 16,722 AF was included in this value*
6) *10,528 AF created for ICS purposes but due to policy limitations in overrun years was used instead to reduce current year's overrun.*
7) *14,299 AF created for ICS purposes but due to policy limitations in overrun years was used instead to reduce current year's overrun.*

TOTAL FALLOWING

All values are provisional consumptive use volume in acre-feet at Imperial Dam

Year	Annual Volume	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2003	3,445	0	0	0	0	0	0	0	0	0	0	0	3,445
2004	79,781	3,445	3,445	3,445	3,445	3,445	3,445	13,925	11,316	11,458	9,976	6,678	5,758
2005	71,205	3,040	3,197	7,815	8,350	8,865	8,262	10,085	9,218	6,873	2,911	1,860	729
2006	98,619	1,132	1,294	10,673	12,028	12,899	11,047	13,815	10,705	10,725	6,480	4,469	3,352
2007	111,115	2,620	6,004	8,693	13,504	16,266	13,428	13,629	12,317	9,235	6,427	3,913	5,079
2008	88,050	5,287	6,278	11,930	12,041	8,361	6,652	11,033	9,158	6,585	5,460	2,295	2,970
2009	90,133	2,479	4,286	8,124	9,323	7,206	4,720	14,050	11,900	10,065	7,613	5,713	4,654
2010	103,761	4,906	4,745	12,528	14,170	9,790	7,536	12,856	9,946	7,430	9,140	5,809	4,905
2011	63,278	2,008	3,996	7,924	12,783	10,901	9,679	3,971	3,405	3,885	1,538	1,925	1,263
2012	125,315	10,426	10,426	10,426	11,216	11,354	11,354	9,449	9,449	9,449	10,589	10,589	10,589
2013	242,403	19,328	19,437	19,438	19,461	19,807	20,734	20,436	20,928	20,740	20,739	20,678	20,677
2014	298,692	25,281	25,281	25,292	25,292	25,292	25,292	24,512	24,512	24,512	24,512	24,512	24,402
2015	197,484	22,003	22,003	22,003	22,003	22,003	22,003	10,862	10,921	10,921	10,921	10,921	10,920
2016													
2017													
Total	**1,573,281**												

Notes:

Each year the monthly breakdown of the annual fallowed volume of water will be refined as time and resources permit.

2003-2004 monthly distribution was assumed to be equally distributed over 13 months (December 2003 through December 2004).

2005-2011 Monthly distribution computed using the previous 12 months (Jul-Dec and Jan-Jun) delivery history for the participating gates in each of the fallowing programs.

2012-2015 Monthly conservation determined by programatic monthly proration.

FINAL DRAFT

TOTAL EFFICIENCY CONSERVATION

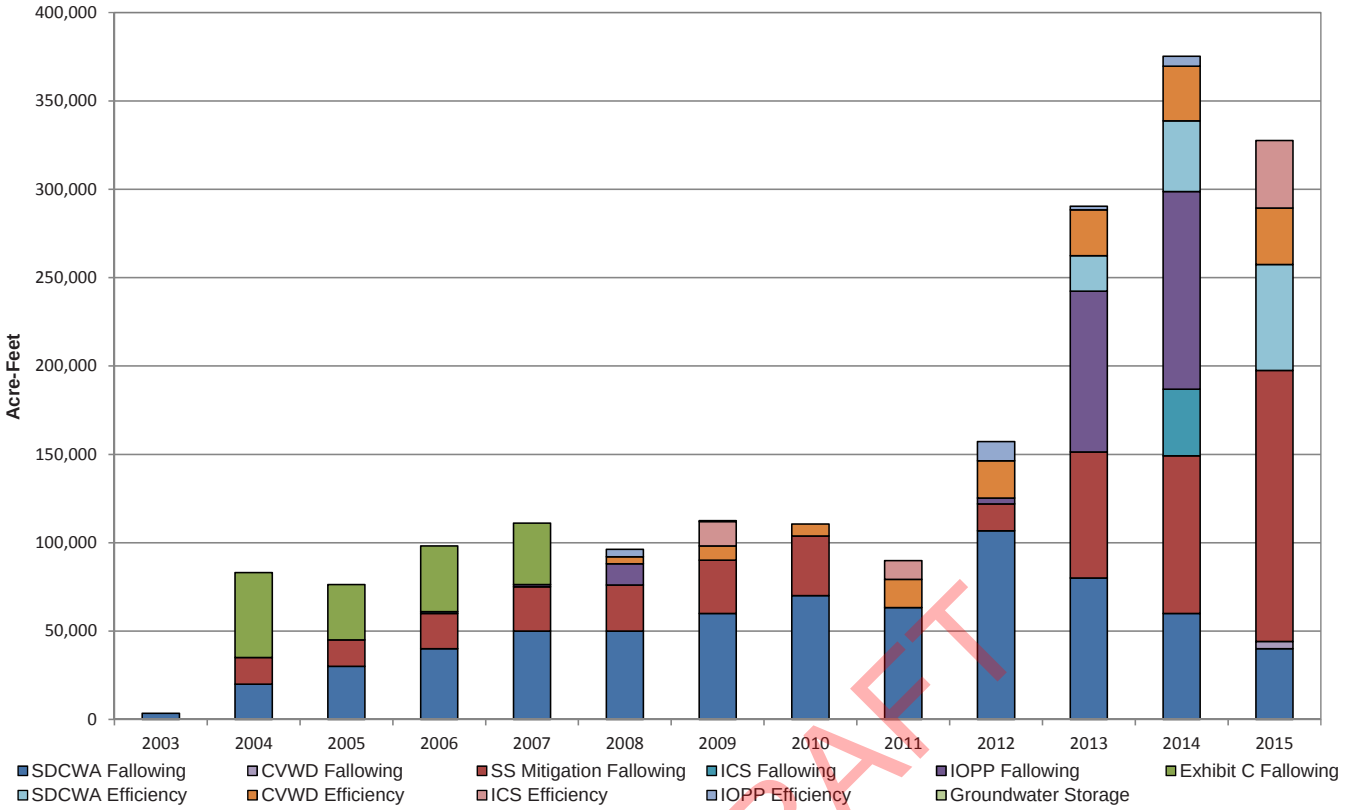
All values are provisional consumptive use volume in acre-feet at Imperial Dam

Year	Annual Volume[1]	System Efficiency	On-Farm Efficiency	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2003	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2008	8,232	7,651	581	0	141	524	697	811	805	906	868	856	1,022	854	748
2009	21,797	21,561	236	719	628	725	888	1,612	2,386	2,199	2,295	2,620	2,879	2,506	2,340
2010	6,809	6,809	0	2,021	671	0	0	0	0	0	0	0	33	1,709	2,375
2011	26,528	26,528	0	2,115	1,980	2,414	2,573	2,494	2,458	2,491	2,296	1,121	2,043	2,159	2,384
2012	31,888	31,888	0	2,363	2,172	2,645	2,752	2,718	2,852	2,931	2,940	2,563	2,860	2,777	2,315
2013	48,052	30,776	17,276	2,649	2,762	3,779	4,058	4,223	4,188	4,540	5,141	4,929	4,724	3,742	3,317
2014	76,602	32,231	44,371	5,598	6,880	10,129	8,836	7,378	5,938	6,984	6,225	5,698	5,232	4,201	3,503
2015	130,156	44,528	85,628	6,006	8,208	11,399	12,504	11,320	11,356	13,312	13,123	12,313	12,514	10,424	7,680
2016															
2017															
Total	**350,064**	**201,972**	**148,092**												

Notes:

1) Annual Volume does not include 1988 IID/MWD Transfer or All-American Canal Lining Project Transfer volumes.

IID QSA ANNUAL CONSERVED WATER SUMMARY

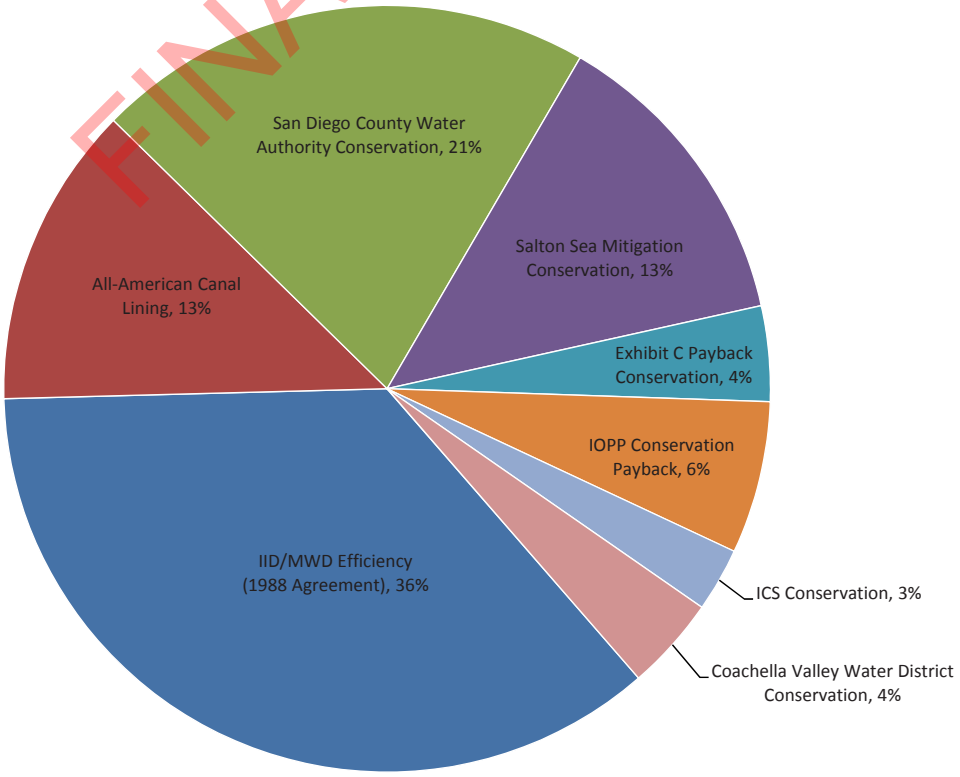


Notes:
- *2004, 2005 and 2006 Exhibit C Fallowing include 9,339 AF of Colorado River Reregulation Conservation and storage and 1,375 AF reduction for loss agreement.*
- *2009 IOPP Efficiency includes 1,797 AF of unused fallowed water left in Colorado River System.*
- *In 2011 and 2012, water created for ICS or IOPP purposes was used to reduce that years' overrun.*

FINAL DRAFT

IID QSA CONSERVATION SUMMARY

2003-2015 Total Conservation=3,767,114 AF



Financial Accounting

FINAL DRAFT

ENVIRONMENTAL PAYMENT OBLIGATIONS

Year	QSA /JPA Payments	Salton Sea Restoration Payments	Total Environmental
2003	$131,395	$29,638	$161,033
2004	$270,674	$61,054	$331,728
2005	$418,191	$94,329	$512,520
2006	$574,316	$129,545	$703,861
2007	$2,398,382	$166,789	$2,565,171
2008	$1,638,487	$171,793	$1,810,280
2009	$941,356	$212,336	$1,153,692
2010	$1,131,196	$255,157	$1,386,353
2011	$1,331,579	$300,356	$1,631,935
2012	$1,542,967	$348,038	$1,891,005
2013	$1,765,841	$398,310	$2,164,151
2014	$1,818,816	$410,259	$2,229,075
2015	$1,873,380	$422,567	$2,295,947
2016	$1,929,582	$435,244	$2,364,826
2017	$1,987,469	$448,301	$2,435,770
2018	$2,261,221	$600,275	$2,861,496
2019	$2,473,610	$760,965	$3,234,575
2020	$2,726,346	$930,755	$3,657,101
2021	$2,885,115	$1,009,134	$3,894,249
2022	$3,309,240	$1,039,408	$4,348,648
2023	$4,746,284	$1,070,590	$5,816,874
2024	$4,888,673	$1,102,708	$5,991,381
2025	$5,035,333	$1,135,789	$6,171,122

Year	QSA /JPA Payments	Salton Sea Restoration Payments	Total Environmental
2026	$5,186,393	$1,169,863	$6,356,256
2027	$5,341,985	$1,204,959	$6,546,944
2028	$5,502,244	$1,241,108	$6,743,352
2029	$5,667,311	$1,278,341	$6,945,652
2030	$5,837,331	$1,316,691	$7,154,022
2031	$6,012,451	$1,356,192	$7,368,643
2032	$6,192,824	$1,396,878	$7,589,702
2033	$6,378,609	$1,438,784	$7,817,393
2034	$6,569,967	$1,481,947	$8,051,914
2035	$6,767,066	$1,526,406	$8,293,472
2036	$6,970,078	$1,572,198	$8,542,276
2037	$7,179,181	$1,619,364	$8,798,545
2038	$7,394,556	$1,667,945	$9,062,501
2039	$7,616,393	$1,717,983	$9,334,376
2040	$7,844,884	$1,769,523	$9,614,407
2041	$8,080,231	$1,822,608	$9,902,839
2042	$8,322,638	$1,877,287	$10,199,925
2043	$8,572,317	$1,933,605	$10,505,922
2044	$8,829,487	$1,991,613	$10,821,100
2045	$9,094,371	$2,051,362	$11,145,733
2046	$9,367,202	$2,112,903	$11,480,105
2047	$9,449,266	$2,176,290	$11,625,556

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* In January 2015, QSA participants approved advance funding the QSA/Joint Powers Authority. IID approved up to $25.5 million. The prepayment is part of a larger proposal by the three water agencies to provide accelerated funding over the next seven years and bridge a projected budget shortfall in the 2015-16 fiscal year.

WATER TRANSFER
REVENUES & EXPENDITURES
2015 BUDGET & ACTUAL

	2015	2015
IID/SDCWA	Budget	Actual
Revenue & Funding		
Water Sales to SDCWA	$65,400,000	$65,400,000
Water Sales to CVWD	2,663,,600	2,643,480
QSA/JPA Environmental Mitigation	2,535,600	2,780,178
JPA Salton Sea Mitigation Reimbursement	17,249,000	13,841,421
Grant Mitigation	30,232,400	-
Interest Income	-	321,655
Capital Settlement Payment (SDCWA)	21,840,300	2,049,816
Total Revenue and Funding	**$139,920,900**	**$87,036,549**
Expenditures		
Environmental Mitigation (JPA)	2,478,800	2,780,152
Environmental Obligation Payments	8,796,000	8,795,947
Mitigation - Misc. Projects	31,138,900	1,012,276
Fallowing Program	30,004,500	25,559,277
System Conservation O&M	2,984,200	4,046,698
On-Farm Payments	17,100,000	30,844,488
Administration/Program Management	2,339,300	1,231,632
General and Administrative Expense (Legal)	3,269,500	577,624
Capital Projects (SCP)	24,840,300	5,049,816
Lost Water Sales	4,200,000	4,200,000
Total Expenditures	**127,151,500**	**84,097,910**
Transfer out to Water Department	**(12,769,400)**	**(2,938,639)**
Total IID/SDCWA	**$ -**	**$0**
Western Farm Lands		
Revenue and Funding	1,400,000	2,422,682
Expenditures	1,011,100	1,671,101
Total Western Farm Lands	**$388,900**	**$751,581**
Local Entity		
Revenue and Funding	10,429,000	1,692,148
Expenditures	10,429,000	1,510,641
Total Local Entity	**$ -**	**$181,507**
Total Water Conservation Programs	**$388,900**	**$933,089**

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IID

A century of service.

OPERATING HEADQUARTERS
333 EAST BARIONI BLVD., IMPERIAL, CA 92251
1-800-303-7756 • www.iid.com

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Appendix K: 2016 City of Calexico Water Quality Consumer Confidence Report

City of Calexico 2015 Urban Water Management Plan

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IMPORTANT
CONSUMER CONFIDENCE REPORT (CCR)

Water Treatment Change May Affect You

El Cambio de Tratamiento Del Agua Le Pueden Afectar a Usted

2016 WATER QUALITY TABLE OF CONTAMINANTS

More than 314 chemicals were tested at the Water Plant and Distribution System and not detected

PRIMARY DRINKING WATER STANDARDS

DETECTED CONTAMINANTS	MCL	PHG/[MCLG]	TREATED WATER		MAJOR SOURCE
			RANGE	AVERAGE	
DISINFECTION BYPRODUCTS (1)					
Trihalomethanes (TTHM)	80 µg/L	N/A	38-120 µg/L	71 µg/L	By-product of drinking water disinfection
Haloacetic Acids (HAA5)	60 µg/L	N/A	7.1-51.2 µg/L	27 µg/L	By-product of drinking water disinfection
Total Organic Carbon (TOC)	TT	N/A	1.8-2.5 µg/L	2.2 mg/L	Various natural and manmade sources
Aluminum	1 mg/L	0.6 mg/L	ND-0.229 mg/L	0.085 mg/L	Erosion of natural deposits; residue from some surface water treatment processes
Fluoride	2.0 mg/L	1mg/L	N/A	0.4 mg/L	Erosion of natural deposit: water additive that promotes strong teeth; discharge from fertilizer and aluminum factories
Barium	1 mg/L	2 mg/L	N/A	0.12 mg/L	Discharges of oil drilling wastes and from metal refineries; erosion of natural deposits
CONSTITUENT	**MCL**	**PHG/[MCLG]**	**RANGE**	**LEVEL**	**MAJOR SOURCE**
Turbidity (2)	TT = 1 NTU TT = 95% of samples≤0.3 NTU	N/A	0.03- 0.07 NTU	0.037 NTU	Soil runoff
Gross Alpha	15pCi/L	[0]	N/A	6.43 ± 2.22 pCi/L	Erosion of natural deposit

SECONDARY DRINKING WATER STANDARDS

CONSTITUENT	MCL	PHG/[MCLG]	RANGE	AVERAGE	MAJOR SOURCE
Aluminum	200 µg/L	N/A	ND-229 µg/L	85 µg/L	Erosion of natural deposits; residue from some surface water treatment processes
Total Dissolved Solids	1000 mg/L	N/A	N/A	720 mg/L	Runoff/leaching from natural deposits
Conductivity	1600 µmhos/cm	N/A	N/A	1200 µmhos/cm	Substances that form ions when in water; seawater influence
Chloride	500 mg/L	N/A	N/A	110 mg/L	Runoff/leaching from natural deposit: seawater influence
Sulfate	500 mg/L	N/A	N/A	260 mg/L	Runoff/leaching from natural deposits: industrial wastes

ADDITIONAL PARAMETERS WITH NO MCLS

CONSTITUENT	MCL/[MRDL]	PHG/[MRDLG]	RANGE	AVERAGE	MAJOR SOURCE
Total Hardness	N/A	N/A	N/A	320 mg/L	Runoff/leaching from natural deposits
Sodium	N/A	N/A	N/A	110 mg/L	Runoff/leaching from natural deposits
PH	N/A	N/A	6.5-8.5 units	7.6 units	A measure of the acidity and alkalinity
Calcium	N/A	N/A	N/A	79 mg/L	Leaching from natural deposits
Magnesium	N/A	N/A	N/A	28 mg/L	Naturally occurring mineral
Potassium	N/A	N/A	N/A	4.7mg/L	Naturally occurring mineral
Bicarbonate alkalinity	N/A	N/A	N/A	150 mg/L	Naturally occurring mineral
Total Alkalinity	N/A	N/A	N/A	120 mg/L	Measure of the ability of a solution to neutralize acids
Chlorine	[4.0 (as Cl_2)]	[4.0 (as Cl_2)]	0.3-0.5 mg/L	0.41 mg/L	Drinking water disinfectant added for treatment

TRIENNIAL LEAD AND COPPER(3)

Constituent	ACTION LEVEL	PHG	90th Percentile Level Detected	No. Exceeding	MAJOR SOURCE
Lead	15 µg/L	0.2 µg/L	<5 µg/L	0	Internal corrosion of household water plumbing system: Discharge from industrial manufacturing: erosion of natural deposits
Copper	1.3 mg/L	0.3 mg/L	0.066 mg/L	0	Internal corrosion of household plumbing system: erosion Of natural deposits: leaching from wood preservative

(1) Maximum based on the highest running annual average range based on detection data from 2016 only.

(2) The turbidity of the filtered water shall be less than or equal to 0.3 NTU in 95% of the measurements taken each month and shall not exceed 1.0 NTU at any time. 100% of samples taken met standards. Highest at the Water Plant was 0.1 NTU. Turbidity is a measure of the cloudiness of the water. The City of Calexico Water Treatment Plant monitors it because it is a good indicator of the effectiveness of the Filtration System.

(3) 40 lead and copper samples were collected and none were above the action levels. Samples were collected in 2014 next sample are scheduled for 2017

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The report contains important information about your drinking water. A drinking water assessment was conducted for the City of Calexico water treatment. No contaminants have been detected on these sources however…most of the watershed's area contains little of consequence in terms of potential contaminant sources. Overall water quality is primarily a function of conditions in the upper Colorado River watershed where most of the runoff originates

Understanding the Tables:

These pages contain detailed information about the water that comes from our tap after it is treated (Treated Water). Your water is regularly tested for more than 314 chemicals and other substances, as well as radioactivity. Only substances that were detected in the treated and raw water are listed in the tables.

Five Ways to Save Water

1. Proper maintenance and setting of lawn sprinkler systems to avoid runoff.
2. Checking for leaks in pipes, hoses, faucets, and toilets.
3. Taking shorter showers and installing low-flow shower heads.
4. Sweeping sidewalks instead of hosing them off.
5. Planting drought-resistant trees and plants when replacing existing landscape.
6. Follow City procedures for water conservation.

Cinco Modos de Ahorrar Agua

1. Mantenimiento apropiado y ajuste de sistemas de rociadores de cesped para evitar exceso.
2. Revisar por escapes en tubos, mangueras, grifos e inodoro.
3. Tina de duchas más cortas e instalación de cabezas de la ducha de flujo bajo.
4. Barrer banquetas en vez de usar mangueras.
5. Plantar árboles resistentes a la sequía y plantas al tiempo de reemplazar el paisaje existente
6. Siga los procedimientos de la Ciudad para la conservación del agua.

Water Treatment Plant Annual Water Quality Report 2016

We are pleased to send you our 2016, City of Calexico Water Treatment Plant Annual Water Quality Report. This report contains important information about your drinking water.

Planta de Tratamiento de Agua Reporte Anual de la Calidad de Agua 2016

La Planta de Tratamiento de Agua Potable de la Ciudad de Calexico se complace en enviarle el Reporte Anual del año 2016. Este reporte contiene información sobre la calidad del agua.

NOTICE: PEOPLE SEEKING ENTRY INTO HOMES TO COLLECT WATER SAMPLES NOT FROM LOCAL WATER COMPANY.

Residents are being advised to use caution when admitting people claiming to be water department employees onto their property. In recent days, people posing as representatives of Calexico Water Dept. have contacted homeowners to allow a representative onto your property, please ask for identification or call Water Dept. at (760) 768-2162 for verification.

AVISO: PERSONAS SOLICITANDO ENTRADA A SUS CASAS PARA COLECTAR MUESTRAS DE AGUA, NO SON DE LA COMPANIA DE AGUA LOCAL.

A los residentes se les está aconsejando que usen cautela cuando permitan a personas afirmando ser empleados del departamento de agua en su propiedad. En dias recientes, gente posando como representantes del departamento de agua de Calexico han contactado a propietarios de casas para que autorizen a un representante a su propiedad para colectar muestras de agua. Estos individuos no son empleados del departamento de agua de la ciudad de Calexico. Si no esta seguro de admitir a un representante de la compañia de agua en su propiedad, por favor pregunte por identificación o llame al departamento de agua al
(760) 768-2162 para verificación.

Lead in water

"If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. Calexico Water Treatment Plant is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested. Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at http://www.epa.gov/safewater/lead."

The Quality Of The Water You Drink

Your tap water continues to meet all **U.S. Environmental Protection Agency (USEPA) and State Water Resources Control Board (State Board)** Drinking Water Health Standards. The City of Calexico Water Treatment Plant employs state of the art treatment technologies and carefully protects its sources of water. This report summarizes the key findings of the Water Treatment Plant 2016 Water Quality testing program, consistent with State and Federal Law and the City of Calexico commitment to inform our customers about their local water supply. The Imperial Irrigation District (IID) and the City of Calexico tested over 314 contaminants to see how our water measures up to State and Federal Drinking Water Standards, (turn to the tables inside). Only these contaminants that had detected levels are shown on the table. At the time of testing, all information contained in the report has been collected and reported in accordance with the Water Quality Standards and Requirements established by the USEPA and State Board. This report provides details as to the source of your water, its contents, and safety. Our water supply comes from the Colorado River via All American Canal. For information regarding specific water quality for your neighborhood or if you have any questions regarding this report, please call or write to the Water Treatment Plant.

Attn: Oscar Trejo
Water Treatment Plant Manager
545 Pierce Avenue • Tel: (760) 768-2162
Email: trejoo@calexico.ca.gov • www.calexico.ca.gov

Why Do We Test Our Water?

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. **USEPA/Centers for Disease Control (CDC) guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-479).** *Drinking* water, including bottle water, may reasonably be expected to contain at least some small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. The sources of drinking water (Both tap and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. In order to ensure that tap water is safe to drink the (USEPA) and the State Board prescribe regulations which limit the amount of certain contaminants in water provided by public water systems. State Board regulations also establish limits for contaminants in bottled water that provide the same protection for public health. Some people may be vulnerable to contaminants in drinking water than the general population. Immune-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants. People with HIV/AIDS on other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. More information about contaminants and potential health effects and guidelines on appropriate means to lessen the risk of infection from microbial contaminants can be obtained by calling USEPA's Safe Drinking Water Hot Line at (800) 426-4791.

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How Can You Be Involved In Decisions That Affect Your Drinking Water?

Attend City Council meetings, which are held every first and third Tuesday of each month at 6:30 p.m. Meetings are held at the Council Chambers at 608 Heber Avenue, Calexico, CA92231 for meeting agendas, please call (760) 768-2102.

Your Water Sources

The drinking water supplied to the City of Calexico customers is purchased from Imperial Irrigation District (IID). This water is a blend of surface water sources from the Colorado River Via All American Canal. Our water is treated at the Calexico Water Plant and then into our water distribution system. A sanitary survey of the watershed that provides water for the City of Calexico and all Imperial Valley was completed on March 2010. This survey assessed the vulnerability of the Imperial Valley-Colorado River to potential forms of contamination. The survey concluded that the natural flushing of the Colorado River controls at the contamination sources or existing water treatment practices regularly mitigates these potential sources of contamination. The raw 25 MG reservoir provides another means of mitigation because water can be drawn from it when water cannot be taken directly from the All American Canal-Colorado River. A copy of the assessment can be obtained by Calling Imperial Irrigation District at 760-335-3640.

TERMS YOU SHOULD KNOW

Primary Drinking Water Standards:

AL (Action Level): The concentration of a contaminant, which, if exceeded, triggers treatment or other requirements that a water system must follow.

Maximum Residual Disinfectant Level (MRDL): The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

Maximum Residual Disinfectant Level Goal (MRDLG): The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

MCL (Maximum Contaminant Level): The highest level of contaminant that is allowed in drinking water. Primary MCLs are set as closed to the PHGs or MCLGs as is economically and technologically feasible. Secondary MCLs are set to protect the odor, taste and appearance of drinking water.

MCLG (Maximum Contaminant Level Goal): The level of contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the United States Environmental Protection Agency.

PHG (Public Health Goal): The level of contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

TT (Treatment Technique): A required process intended to reduce the level of a contaminant in drinking water.

PDWS (Primary Drinking Water Standard): MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

QUESTIONS ABOUT WATER QUALITY

Who Regulates Drinking Water Quality?

The United States Environmental Protection Agency (USEPA) establishes and enforces national drinking water standards. In California, enforcement of drinking water standards falls under the State Boards. Both agencies set Maximum Contaminant Levels (MCLs) for various compounds in water to provide safe drinking water supplies.

What Do The Standards Mean?

Drinking water standards are based on consuming water every day over a lifetime, without any harmful effects. They also take into account exposure to substances found in the air and in the foods we eat. Our drinking water supply is regularly tested for minerals, inorganic and organic compounds, radioactivity, bacteria, and other substances.

Footnotes Abbreviations: ***ND*** None Detected ***NA*** Not Applicable ***NS*** No Standard ***Pci/L*** Picocuries per liter (a measure of radiation) ***Ppb*** Parts per billion (ug/L) ***Ppm*** Parts per million (mg/L)

(a) Year monitored: The State allows us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not change frequently.

(b) Lead & Copper: Data is shown in the 90th percentile column. Forty homes were tested. None exceeded the action level. The last lead and copper was done in 2014.

NOTE: *The 2016 Water Quality Table provides you with data on the levels of specific constituents detected in the water supply and how these compare to state standards.*

The State Board requires this report be distributed to our customers each year. The report is based on requirements supplied by State Board, Division of Drinking Water, as of January 2016.

Contaminants that may be present in source water include:	Possible Source:
Microbial contaminants such as viruses and bacteria	Sewage treatment plants, septic systems, agricultural livestock operations, and wildlife
Inorganic compounds such as salts and metals	Naturally - occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas productions mining and farming
Organic Contaminants including synthetic and volatile organic	By-products of industrial processes, petroleum production, gas stations, urban stormwater runoff, agricultural application, and septic systems.
Pesticides and Herbicides	A variety of sources such as agriculture, urban stormwater runoff, and residential uses
Radioactive Contaminants	Naturally - occurring on the result of oil and gas production and mining activities

La Calidad Del Agua Que Usted Toma

Su agua potable continúa teniendo todos las normas o niveles de salud de agua para tomar de la **Agencia de Protección al Medio Ambiente de los Estados Unidos de América (USEPA) y el State Water Resources Control Board (State Board)**. La Planta de Tratamiento de Agua Potable de la Ciudad de Calexico emplea tecnologías de tratamiento vanguardistas y protégé cuidadosamente sus recursos de agua. Este reporte resume los encuentros principales del programa de pruebas de la calidad del agua de la Planta de Tratamiento de Agua del 2016, consistente con las leyes Estatales y Federales y el compromiso de la ciudad de Calexico de informarles a nuestros clientes acerca de su provision de agua local.

El Distrito de Irrigación del Valle Imperial (IID) y la Ciudad de Calexico hicieron pruebas de más de 314 contaminantes para ver como nuestra agua se comparaba a los estandartes estatales y federales de agua potable, diríjase a las tablas de adentro.Unicamente estos contaminantes que tenían niveles detectables son mostrados en la tabla. Al tiempo de las pruebas, toda la información contenida en este reporte ha sido colectada y reportada de acuerdo con los estandartes de la calidad de agua y requisites establecidos por USEPA y DHS. Este reporte provee detalles como el origen de su agua, sus contenidos y seguridad. Nuestra fuente de agua proviene del Rio Colorado por medio del Canal Americano. Para información referente a una calidad particular del agua para su vecindad o si tiene alguna pregunta referente a este reporte, favor de llamar o escribir a la Planta de Tratamiento de Agua Potable.

Attn: Oscar Trejo
Water Treatment Plant Manager
545 Pierce Avenue • Tel: (760) 768-2162
Email: trejoo@calexico.ca.gov • www.calexico.ca.gov

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Por Que Probamos Nuestra Agua Potable?

El agua potable, incluye agua de garrafón puede esperarse rasonablemente que contenga la mínima pequeña cantidad de algunos contaminantes. La presencia de contaminantes no necesariamente indica que el agua sea un riesgo para su salud. Las fuentes del agua potable (ambos, de la llave y de garrafón) incluyen rios, lagos, arroyos, estanques, canteras, manantiales y pozos. Al viajar el agua sobre la superficie de la tierra o por de bajo, se disuelve naturalmente produciendo minerales y en algunos casos materiales radioactivos y puede recoger sustancias debido a la presencia de animales o de actividad humana. Para poder asegurar que el agua potable es segura para ser tomada, la Agencia de Protección al Medio Ambiente de los Estados Unidos (USEPA) y el Departamento de State Board dictan regulaciones que limitan la cantidad de ciertos contaminantes en el agua proporcionada por los sistemas de agua pública. El Departamento de Salud también ha establecido límites de contaminantes en el agua embotellada que provee la misma protección para la salud pública. Algunas personas pueden ser más vulnerables a contaminantes en el agua potable que la población en general. Como personas con cáncer que estan bajo tratamiento de quimo-terapia, personas que hayan recibido trasplantes de órganos, personas con HIV-SIDA, o personas con enfermedades del organismo, también personas de la tercera edad e infantes son los más indicados de correr riesgo de infecciones. Estas personas deben de preguntar sobre el uso del agua con sus médicos. USEPA, Centro de Control de Enfermedades tiene información para prevenir todo tipo de infecciones por contaminantesmicrobiales, puede ser obtenida llamando a la línea de emergencia de USEPA del Agua Potable al (800) 426-4791.

Como Puede Usted Involucrarse En Decisiones Que Afectan Su Agua Potable?

Asista a las juntas de Regidores, las cuales se llevan a cabo cada primer y tercer martes de cada mes a las 6:30 p.m.. Las juntas se llevan a cabo en la Sala de Regidores en 608 Avenida Heber, Calexico, CA 92231, para las agendas de las juntas, favor de llamar al (760) 768-2102.

Este reporte contiene información importante referente a su agua potable. Un asesoramiento del agua potable fué conducido por el tratamiento de agua de la Ciudad de Calexico no se detectaron contaminantes en estas fuentes, sin embargo…la mayoría del área de los derrames de agua contiene poca consecuencia en términos de fuentes de contaminantes potenciales. En conjunto la calidad de agua es principalmente una function de las condiciones de la parte de arriba del Rio Colorado de la divisoría de aguas donde originan la mayoría de los derrames de agua.

Sus Fuentes De Agua

El agua potable abastecida a los clientes de la Ciudad de Calexico es comprada del Distrito de Irrigación de Imperial (IID). Esta agua es una mezcla de agua de superficie que origina del Rio Colorado por medio del Canal Todo Americano. Nuestra agua es tratada en la Planta de Agua de Calexico y después en nuestro sistema de distribución de agua. Una encuesta sanitaria de la divisoría de agua que proporciona agua para la Ciudad de Calexico y todo el Valle Imperial fué completada en Marzo 2010. Esta encuesta asesoró la vulnerabilidad del Valle Imperial – Rio Colorado a formas potenciales de contaminación. La encuesta concluyó que el desahogo natural del Rio Colorado controla las fuentes de contaminación o las prácticas de tratamiento de agua en existencia regularmente mitiga estas fuentes potenciales de contaminación. La cantera 25 MG sin refinar proporciona otra manera de mitigar porque agua puede ser sacada de ahí cuando el agua no puede ser tomada directamente del Canal Todo Americano - Rio Colorado.

TERMINOS QUE USTED DEBE SABER

Estandartes Primarios De Agua Potable:

AL (Nivel de Acción Regulatoria): La concentración de un contaminante, el cual si excede, inicia tratamiento u otros requisitos que un sistema de agua debe seguir.

Máximo Nivel de Desinfectante Residual (MRDL): El más alto nivel de contaminante permitido en el agua potable. Existe evidencia convincente de que añadir desinfectante es necesario para el control de contaminantes microbiales.

Meta de Máximo Nivel de Desinfectante Residual (MRDLG): El nivel de un desinfectante de agua potable más abajo del cual no hay ningun desconocido o inesperado riesgo a la salud. MRDLGs no refleja los beneficios del uso de desinfectantes para controlar contaminantes microbiales.

MCL (Máximo Nivel De Contaminantes): El nivel más alto de cualquier contaminante que es permitido dentro del agua potable. MCLs Primarios son puestos tan cerca de los PHGs ó MCLGs como es possible economicamente y tecnologicamente.MCLs Secundarios son puestos para proteger el olor, sabor y apariencia del agua potable.

MCLG (Meta y Máximo Nivel De Contaminantes): El nivel más alto de cualquier contaminante que está abajo de los niveles permitidos y que poseen o que es sabido que no hay riesgo de salud. Estos niveles son aprobados por la Agencia de Protección al Medio Ambiente de Estados Unidos.

PHG (Meta De Salud Pública): El nivel de contaminante en el agua potable abajo para el cual no se sabe o se espera un riesgo a la salud. PHGs son puestos por la Agencia de Protección al Medio Ambiente de California.

TT (Técnica de Tratamiento): Un proceso requerido con la intensión de reducir el nivel de un contaminante en el agua potable.

PREGUNTAS ACERCA DE LA CALIDAD DE AGUA

Quién Regulariza La Calidad De Agua Potable?

La Agencia de Protección al Medio Ambiente de Estados Unidos (USEPA) establece y cumple con los parámetros nacionales de agua potable. En California, el cumplimiento de los parámetros de agua potable es la responsabilidad State Board, División de Agua Potable, ambas agencias deciden los Máximos Niveles de Contaminantes (MCLs) para varios compuestos en el agua para proporcionar provisiones seguras de agua potable.

Que Significan Los Parámetros?

Los parámetros de agua potable son basados en el consumo de agua cada día sobre el transcurso del tiempo de una vida, sin ningún efecto dañino, también tomar en cuenta la exposición a sustancias encontradas en el aire y en los alimentos que comemos. Nuestra provisión de agua potable es regularmente probada por minerales, compuestos inorgánicos y orgánicos, radioactividad, bacteria y otras sustancias

Por Que El Agua Potable A Veces Aparece Turbia?

El sistema de bombeo de nuestros tanques de almacenaje de agua potable puede atrapar burbujas de aire causando que el agua aparezca turbia. El agua potable se aclarará si usted le permite que se asiente hasta que las burbujas de aire se acaben.

Como Puedo Mejorar El Sabor De Mi Agua?

Enfríe un jarro de agua potable por lo menos dos horas para mejorar el sabor. Guarde una provisión en el refrigerador para que todo el tiempo esté lista cuanto tenga sed.

Abreviaciones A Pie De Página: ***ND*** Ninguno Detectado ***NS*** No Estándar ***Pci/L*** Picocuries por litro (una medida de radiación***) Ppb*** Partes por billon ***Ppm*** Partes por millón

(a) Año Monitoreado: El Estado nos permite hacer un seguimiento de algunos contaminantes por lo menos de una vez por año porque la concentración de estos contaminantes no cambia frecuentemente.

(c) Plomo y Cobre: Los datos son mostrados en la columna del 90vo porcentaje.Treinta y cuatro casas fueron probadas.Ninguna excedió el nivel de acción. El ciclo de prueba de los últimos tres años fué terminado en 2014.

NOTA: *La Tabla de la Calidad de Agua del 2016 le proporciona información en los niveles de constituyentes específicos detectados en el suministro de agua y como estos se comparan con los estandartes estatales.*

State Board requiere que este reporte sea distribuido a nuestros clientes cada año. Este reporte está basado en los requisitos proporcionados por State Board, División de Agua Potable y Manejo del Ambiente desde Enero 2016.

FINAL DRAFT

Appendix L: UWMP Coordination & Outreach Efforts

City of Calexico 2015 Urban Water Management Plan

FINAL DRAFT

608 Heber Ave.
Calexico, CA 92231-2840
Tel: 760.768.2160
Fax: 760.768.0992
www.calexico.ca.gov
e-mail:nfl@calexico.ca.gov

CITY OF CALEXICO

Public Works Department

March 6, 2017

Erik Ortega
Director – Division 4
Imperial Irrigation District
333 E. Barioni Blvd.
Imperial, CA 92251

Subject: City of Calexico Urban Water Management Plan 2015 Update

Dear Mr. Ortega:

This serves as a formal 60-day notice to inform agencies that the City of Calexico is intending to review and update its Urban Water Management Plan (UWMP) pursuant to California State Water Code Section 10610-10610.04. A public hearing for the City's UWMP will be scheduled to take place this coming April or May. The exact date and time will be sent out in the near future.

Additional notices will be sent two weeks and one week prior to the actual public hearing date. If you have any questions or require additional information, please do not hesitate to contact our office at 760/768-2160.

Sincerely,

CITY OF CALEXICO

Nick Fenley
Public Works Manager

Cc: Oscar Trejo, Chief Operator

FINAL DRAFT

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CITY OF CALEXICO

Public Works Department

March 6, 2017

Gordon Gaste
Planning Director
City of Brawley
400 Main Street
Brawley CA 92227

Subject: City of Calexico Urban Water Management Plan 2015 Update

Dear Mr. Gaste:

This serves as a formal 60-day notice to inform agencies that the City of Calexico is intending to review and update its Urban Water Management Plan (UWMP) pursuant to California State Water Code Section 10610-10610.04. A public hearing for the City's UWMP will be scheduled to take place this coming April or May. The exact date and time will be sent out in the near future.

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Sincerely,

CITY OF CALEXICO

Nick Fenley
Public Works Manager

Cc: Oscar Trejo, Chief Operator

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CITY OF CALEXICO

Public Works Department

March 6, 2017

Jorge Galvan
City of Imperial
Planning & Development Director
420 S. Imperial Ave
Imperial, CA 92251

Subject: City of Calexico Urban Water Management Plan 2015 Update

Dear Mr. Galvan:

This serves as a formal 60-day notice to inform agencies that the City of Calexico is intending to review and update its Urban Water Management Plan (UWMP) pursuant to California State Water Code Section 10610-10610.04. A public hearing for the City's UWMP will be scheduled to take place this coming April or May. The exact date and time will be sent out in the near future.

Additional notices will be sent two weeks and one week prior to the actual public hearing date. If you have any questions or require additional information, please do not hesitate to contact our office at 760/768-2160.

Sincerely,

CITY OF CALEXICO

Nick Fenley
Public Works Manager

Cc: Oscar Trejo, Chief Operator

FINAL DRAFT

CITY OF CALEXICO

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e-mail:nfl@calexico.ca.gov

Public Works Department

March 6, 2017

Jim Minnick
Planning & Development Services
Imperial County
155 S. 11th St.
El Centro, CA 92243

Subject: City of Calexico Urban Water Management Plan 2015 Update

FINAL DRAFT

Dear Mr. Minnick:

This serves as a formal 60-day notice to inform agencies that the City of Calexico is intending to review and update its Urban Water Management Plan (UWMP) pursuant to California State Water Code Section 10610-10610.04. A public hearing for the City's UWMP will be scheduled to take place this coming April or May. The exact date and time will be sent out in the near future.

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Sincerely,

CITY OF CALEXICO

Nick Fenley
Public Works Manager

Cc: Oscar Trejo, Chief Operator

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CITY OF CALEXICO

Public Works Department

March 6, 2017

Terry Hagen
City Engineer
City of El Centro
1275 Main Street
El Centro, CA 92243

Subject: City of Calexico Urban Water Management Plan 2015 Update

Dear Mr. Hagen:

This serves as a formal 60-day notice to inform agencies that the City of Calexico is intending to review and update its Urban Water Management Plan (UWMP) pursuant to California State Water Code Section 10610-10610.04. A public hearing for the City's UWMP will be scheduled to take place this coming April or May. The exact date and time will be sent out in the near future.

Additional notices will be sent two weeks and one week prior to the actual public hearing date. If you have any questions or require additional information, please do not hesitate to contact our office at 760/768-2160.

Sincerely,

CITY OF CALEXICO

Nick Fenley
Public Works Manager

Cc: Oscar Trejo, Chief Operator

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Appendix M: References

City of Calexico 2015 Urban Water Management Plan

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REFERENCES

The following are documents or webpages which were used in the preparation of this UWMP

- 2010 Urban Water Management Plan, City of Calexico
- 2015 Imperial County General Plan http://www.icpds.com/?pid=571
- City of Calexico 2015 General Plan Update: http://www.calexico.ca.gov/vertical/sites/%7B342ED706-1EBB-4FDE-BD1E-9543BAD44C09%7D/uploads/Calexico_2015_General_Plan_Update_August_2015.pdf
- Imperial Irrigation District Library http://www.iid.com/water/library#W
- 2003 Colorado River Quantification Settlement Agreement Summary http://www.sdcwa.org/sites/default/files/qsa-fs.pdf
- Dept. of Water Resources Bulletin 118: Imperial Valley Groundwater Basin http://www.water.ca.gov/groundwater/bulletin118/basindescriptions/7-30.pdf
- Dept. of Water Resources: *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use*
- Dept. of Water Resources: *California Water Plan Update 2013*
- County of Imperial: *2015 Agricultural Crop & Livestock Report*
- US Census Bureau Data & Statistics: QuickFacts/Calexico city, California http://www.census.gov/quickfacts/table/POP060210/0609710
- California Dept. of Finance: Population & Demographic Data http://www.dof.ca.gov/Forecasting/Demographics/
- California Urban Water Conservation Council: Updated BMPs & BMP Resources https://www.cuwcc.org/Resources/BMP-Resources
- US Bureau of Reclamation: *Quality of Water Colorado River Basin Progress Report No. 22*
- Colorado River Water Users Association: *2016 Annual Report & Member Directory*
- Imperial Irrigation District: *Equitable Distribution Plan*, *Revised Oct. 2013*

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FINAL DRAFT