

RECLAMATION

Managing Water in the West

Final Environmental Assessment

Yuma Desalting Plant Pilot Run



U.S. Department of the Interior
Bureau of Reclamation
Yuma Area Office
Yuma, Arizona

August 2009

Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Final Environmental Assessment

Yuma Desalting Plant Pilot Run

Prepared by

**U.S. Department of the Interior
Bureau of Reclamation
Yuma Area Office
Environmental Compliance Group
Yuma, Arizona**



**U.S. Department of the Interior
Bureau of Reclamation
Yuma Area Office
Yuma, Arizona**

August 2009

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Acronyms and Abbreviations

1944 Water Treaty	Treaty with Mexico Relating to the Utilization of the Waters of the Colorado and Tijuana Rivers and of the Rio Grande
ADEQ	Arizona Department of Environmental Quality
AF	acre-feet
AGFD	Arizona Game and Fish Department
APP	Aquifer Protection Permit
AZPDES	Arizona Pollutant Discharge Elimination System
AZSERC	Arizona State Emergency Response Commission
BLM	U.S. Bureau of Land Management
BMP	best management practice
CAA	<i>Clean Air Act</i>
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
Cienega	Cienega de Santa Clara
CRB	Colorado River Basin
CWA	<i>Clean Water Act</i>
dB	decibel
DMF	dual media filter
DPOC	drainage pump outlet channel
DOI	Department of the Interior
EA	Environmental Assessment
EIS	environmental impact statement
EPA	Environmental Protection Agency
EPCRA	<i>Emergency Planning and Community Right-to-Know Act</i>
ESA	<i>Endangered Species Act</i>
FONSI	Finding of No Significant Impact
HCP	Habitat Conservation Plan
IBWC	International Boundary and Water Commission
ICS	Intentionally Created Surplus
Interim Guidelines	Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead
ITA	Indian Trust Asset
Joint Report	Joint Report Of The Principal Engineers Concerning U.S.-Mexico Joint Cooperative Actions Related To The Yuma Desalting Plant (YDP) Pilot Run And The Santa Clara Wetland
LCR	Colorado River in the Lower Basin (lower Colorado River)
LEPC	Local Emergency Planning Committee
Limitrophe	the 23-mile segment of the lower Colorado River that serves as the international boundary between the U.S. and Mexico
MODE	Main Outlet Drain Extension
MSCP	Multi-Species Conservation Program
MSDS	Material safety data sheet(s)
NEPA	<i>National Environmental Policy Act</i>
NIB	Northerly International Boundary
NPDES	National Pollutant Discharge Elimination System
OSHA	Occupational Safety and Health Administration
Pilot Run	Operation of the YDP at one-third capacity of the original design for 365 operating days during a 12 to 18 month period
PM₁₀	particulate matter that is 10 microns in diameter or less

Acronyms and Abbreviations (cont.)

ppm	parts per million
PSMP	Process Safety Management Plan
RCRA	<i>Resource Conservation and Recovery Act</i>
Reclamation	Bureau of Reclamation
RM	river mile
RMP	Risk Management Plan
RO	reverse osmosis
Salinity Control Act	<i>Colorado River Basin Salinity Control Act of 1974</i>
SCR	solids contact reactor
SARA	<i>Superfund Amendments and Reauthorization Act</i>
SERC	State Emergency Response Commission
SIB	Southerly International Boundary
SQG	small quantity generator
TDS	total dissolved solids
TRI	toxics release inventory
U.S.	United States
USFWS	U.S. Fish and Wildlife Service
WQIC	Water Quality Improvement Center
WMIDD	Wellton-Mohawk Irrigation and Drainage District
YAO	Yuma Area Office
YDP	Yuma Desalting Plant

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1.0 Purpose of and Need for Proposed Action

The Bureau of Reclamation (Reclamation), Yuma Area Office (YAO) has prepared this environmental assessment (EA) to evaluate potential effects associated with short-term and limited scale operation of the Yuma Desalting Plant (YDP) primarily for data gathering purposes. The analysis presented in this EA includes evaluation of the Proposed Action, the No Action Alternative, and alternatives considered but eliminated from further discussion. This EA complies with the *National Environmental Policy Act* (NEPA) (42 USC 43421 *et seq.*), in accordance with the Council on Environmental Quality (CEQ) regulations (Title 40 of the Code of Federal Regulations [CFR] Parts 1500-1509), and the Department of the Interior (DOI) and Reclamation NEPA procedures (516 DM 14).

1.1 Background

The YDP was constructed pursuant to the *Colorado River Basin Salinity Control Act of 1974* (Salinity Control Act). The Salinity Control Act authorized the construction, operation, and maintenance of certain works in the Colorado River Basin to control the salinity of water delivered pursuant to the 1944 United States (U.S.) Treaty with Mexico Relating to the Utilization of the Waters of the Colorado and Tijuana Rivers and of the Rio Grande (1944 Water Treaty). Title I of the Salinity Control Act provides for programs downstream from Imperial Dam to implement the provisions of Minute 242 of the International Boundary and Water Commission (IBWC), U.S. and Mexico, including a desalting complex.¹

1.2 Introduction

To implement provisions of Title I of the Salinity Control Act, construction of the YDP was largely completed in 1992. Shortly thereafter, it was commissioned for operation at one-third capacity. However, YDP operations were interrupted in 1993 due to the Gila River flood that damaged the Main Outlet Drain Extension

¹ In accordance with NEPA, Reclamation performed an analysis of potential environmental effects related to implementation of these actions, including construction and operation of the YDP, proposed under the Salinity Control Act. That analysis was published in June 1975 as the *Final Environmental Statement Colorado River Basin Salinity Control Project Title I* (Reclamation 1975). A digital copy of this Environmental Statement is available upon request from Reclamation.

(MODE) intake canal which provides feed water to the YDP. The YDP has not operated since 1993 except for a three month demonstration run in 2007 at about ten percent of full capacity. To date, multiple technological modifications have been made to the YDP to maintain ready reserve status and address design deficiencies. The effectiveness of these modifications along with other features of the YDP are proposed to be tested during the proposed Pilot Run.

1.3 Location and Setting

As shown in Figure 1-1, the YDP is located on the northern edge of the Yuma Valley, approximately four miles west of Yuma, Arizona, in the historic flood plain and delta of the lower Colorado and Gila Rivers. Yuma is considered one of the largest and fastest growing cities in the area with a population of approximately 93,719 (ADC 2008b). Current population estimates for other nearby communities in Yuma County are: San Luis – 27,705; Somerton – 11,377; Wellton – 2,318; and Unincorporated Yuma County – 69,660 (ADC 2008b).

The region is characterized by sparse Sonoran Desert habitat, with irrigated tracts in the river valleys and strips of riparian vegetation along the streams, canals, and drainage channels. The climate of the region is hot and dry in the summers, with average maximum daily temperatures ranging from 104° to 108° Fahrenheit. Temperatures in the winter months typically are in the mid-60s. Precipitation generally occurs from July through October in the form of isolated thunderstorms and again during the winter.



Figure 1-1 Location and Vicinity of the YDP Project Area

1.4 Purpose and Need

Drought conditions, population growth, and the continuing need for water for municipal, environmental, and recreational uses in the lower Colorado River (LCR) have created further demand on an already stressed water supply. The drainage water from Wellton-Mohawk Irrigation and Drainage District (WMIDD), which is not counted towards Mexico's Colorado River allocation (as delineated in the 1944 Water Treaty), could instead be used to meet 1944 Water Treaty obligations if YDP operations are resumed. Water discharged by the YDP into the Colorado River means that a like amount of water need not be released from Hoover Dam for water deliveries to Mexico. Preserved water is then available for beneficial use in the U.S.

Reclamation has been contacted by the Central Arizona Water Conservation District, the Metropolitan Water District of Southern California, and the Southern Nevada Water Authority regarding the need to obtain information regarding the capability and operational readiness of the YDP. This information can only be understood through actual operation of the facility. Without this real-time information, Reclamation would not be able to determine whether the YDP could reliably operate on a long-term basis in the future, or determine what, if any, improvements to the facility may be necessary to ensure the most efficient, cost effective and reliable long-term operation.

Long-term operation is outside the scope of this EA and would only be considered in the future, and in accordance with appropriate federal law. This future consideration will require YDP cost and performance data which is not currently available. This data can only be obtained through actual operation of the YDP at a scale and for a duration which covers seasonal variation when chemical use and power consumption are highly variable. For the purposes of this EA, this means operating the YDP at one-third capacity of the original design for 365 operating days during a 12 to 18 month period (Pilot Run).

The purpose of the Proposed Action is different from the purposes of the 2007 Demonstration Run. The purposes of the 2007 Demonstration Run were to acquire current operational data, test equipment already replaced to address design deficiencies, and conduct research applicable to the resolution of remaining design deficiencies. The three month demonstration period did not, however, provide sufficient data to evaluate long-term operation. In addition, the demonstration run utilized a different pre-treatment process (polymer in place of lime-softening process) than original plant design. The demonstration run was conducted at an insufficient scale, limited time period and utilized an alternative pre-treatment process. Therefore, the data from this demonstration is insufficient to provide the level of cost and performance information needed to evaluate long-term operation.

1.4.1 Purpose of the Proposed Action

The purpose of the Proposed Action is to:

- operate the YDP as designed at a sufficient flow and appropriate duration to gather benchmark performance and cost data which can only be obtained through actual plant operations;
- determine whether any additional corrective actions to plant design or equipment would be necessary for long-term operation of the plant; and
- test changes and corrections (such as the fully-automated distributed control system) which have already been implemented at the YDP as part of maintaining its ready reserve status.

Each of these critical pieces of information is needed by Reclamation and all interested parties to adequately consider potential, long-term, and sustained operation of the YDP.

1.4.2 Need for the Proposed Action

The need to operate the YDP for a Pilot Run is to:

- obtain information regarding actual plant operation which will test theoretical analysis and provide information about the plant's operating capability to reliably produce product water which could be used for multiple end uses;
- verify the suitability of treatment processes and associated facilities during actual plant performance, determine baseline operating costs, test the effectiveness of completed plant improvements, and assess how plant equipment will respond to daily operation; and
- provide process related effluent and emissions data for a sufficient period of time to provide a basis to analyze, in a separate, future decision, potential environmental consequences of YDP operation.

1.5 Scope of Analysis

Some issues are not affected by the Proposed Action. Section 3.0 provides a brief description of the issues and the reasons why the issues were eliminated from further detailed analysis. These issues include:

- Aesthetics
- Cultural Resources
- Geology and Soils
- Land Use

Further analyses were determined to be necessary for the following resource areas and issues. Therefore, the analyses presented in Section 3.0 are focused on these topics:

- Air Quality
- Biological Resources
- Water Resources
- Hazardous Materials
- Indian Trust Assets
- Environmental Justice
- Noise
- Climate Change

1.6 International Considerations

Drought conditions, population growth, and the continuing need for water for municipal, environmental and recreational uses in the LCR have created further demand on an already-stressed limited water supply. The average Colorado River flow since calendar year 2000 is the lowest nine-year average in over 100 years of record keeping. In July 2009, the estimated elevation of Lake Mead was 1,092 feet; the first time Lake Mead has fallen below the 1,100 foot elevation in 44 years. As of the date of this EA, this elevation remains approximately 17 feet above the trigger for shortage declaration under the Colorado River Interim Guidelines for Lower Basin Shortages and Coordinated Operations for Lake Powell and Lake Mead (Interim Guidelines). Continuation of these drought conditions could lead to reduced deliveries of water to users of the Colorado River as addressed in the Interim Guidelines.

Water managers in the LCR Basin including Reclamation continue to pursue multiple efforts to conserve and stretch existing water supplies, as well as efforts to identify and secure additional water supplies for entities that rely on the LCR. One such means to stretch existing supplies is to operate the YDP. A January 14, 2009 letter from a consortium of municipal utilities (Central Arizona Water Conservation District, the Metropolitan Water District of Southern California and Southern Nevada Water Authority) requested that Reclamation propose a Pilot Run of the YDP “in order to obtain information regarding the capability and operational readiness of the YDP that can only be understood through actual operation of the YDP.” This letter is available at http://www.usbr.gov/lc/yuma/environmental_docs/ydp/ydp_request_14Jan09.pdf.

The proposed Pilot Run will allow Reclamation and interested stakeholders to better understand the operational reliability, suitability of treatment processes, baseline operating costs and any possible environmental consequences for operating the YDP. Operating the YDP is one approach to replacing or recovering the Bypass Drain flow.

The proposed YDP Pilot Run will result in a reduction of flow and an increase in salinity in the Bypass Drain. These flows currently reach the Cienega in Mexico. Modification of flows into the Bypass Drain prompted discussions among U.S. and Mexican entities regarding potential impacts on the environment of the Cienega.

Given that the Cienega is located wholly within Mexico, Mexico has exclusive control over any water that crosses into Mexico's sovereign boundaries. Matters related to the Cienega are matters of foreign policy that are addressed through the IBWC, the international body responsible for addressing Colorado River matters between the U.S. and Mexico, pursuant to the 1944 Water Treaty.

Following identification of Reclamation's Proposed Action, consultations between the U.S. and Mexico were initiated through the IBWC. These consultations built upon previous consultations between the two countries that addressed flows into the Bypass Drain and environmental concerns regarding environmental resources and values in Mexico. (See, e.g., Minutes 242 and 306).² Consultations on the proposed YDP Pilot Run also included non-governmental entities from Mexico. Reclamation provided available information on the Proposed Action and on the Cienega, including a draft version of this EA and associated appendices, to facilitate effective consultation, and deferred to the IBWC regarding the diplomatic process that was required to address the relevant foreign policy considerations.

The diplomatic process and consultations undertaken through the IBWC resulted in the proposal and consideration of nine joint cooperative actions. The development of the joint cooperative actions that resulted from the consultations included a partnership of non-governmental entities from the U.S. and Mexico. Subsequently, these cooperative actions were documented in the "Joint Report Of The Principal Engineers Concerning U.S.-Mexico Joint Cooperative Actions Related To The Yuma Desalting Plant (YDP) Pilot Run And The Santa Clara Wetland" (Joint Report) (see Appendix C).

² The U.S. and Mexico have a long history of consulting on Colorado River matters pursuant to the 1944 Water Treaty, particularly with respect to salinity issues and the YDP. See IBWC Minutes 242 and 306. Moreover, recent statutory authority, Section 397 of Public Law 109-432, re-affirms the IBWC's longstanding practice of consultation on matters and impacts occurring outside the boundary of the U.S. pursuant to the 1944 Water Treaty:

The Treaty between the United States of America and Mexico relating to the utilization of waters of the Colorado [River] . . . and supplementary protocol . . . is the exclusive authority for identifying, considering, analyzing, or addressing impacts occurring outside the boundary of the United States of works constructed, acquired, or used within the territorial limits of the United States.

The joint cooperative actions documented in the Joint Report include:

- A commitment from the U.S., Mexico and a partnership of U.S. and Mexico non-governmental organizations to arrange in equal shares for a total of 30,000 acre-feet (AF) for the Cienega in connection with the reduction in flow to the Cienega that would occur during the Proposed Action in the absence of this cooperative action. The U.S. will operate its system in a manner that will allow the conveyance of the U.S. 10,000 AF of committed water (non-storable Colorado River flow) and do so in a manner such that the water is not counted as part of Mexico's water allocation under the 1944 Water Treaty.
- The Municipal Utilities committed to contribute \$250,000 towards a bi-national monitoring program. This program is being developed by the Work Groups and Core Groups within the context of the Colorado River Joint Cooperative Process. Mexico and U.S. non-governmental entities are participants in this process.
- The U.S. will provide a one-time \$100,000 contribution for extraordinary maintenance of the Bypass Drain.
- Both countries have committed, pursuant to Minute 306 and through the Colorado River Joint Cooperative Process, to continue bi-national cooperation regarding the Cienega and to address long-term approaches to maintain the environmental values of the Cienega.

The joint cooperative actions documented in the Joint Report were developed following receipt of commitment letters from each entity (i.e., the U.S., Mexico and the non-governmental participants) as described in the Joint Report. The Joint Report was approved by the U.S. and Mexican Sections of the IBWC. The process and timeline for the development of the agreed-upon joint cooperative actions is explained in Appendix C.

In accordance with all applicable law, including, for example, NEPA, the 1944 Water Treaty and appropriate implementing protocol, Section 397 of Public Law 109-432, and Executive Order 12114, this EA addresses potential effects of the proposed Pilot Run within the U.S. The Cienega de Santa Clara Literature Review, Appendix E, has been included to present a review of currently available literature on the topic.³

³ The EA includes an updated Appendix E, Cienega de Santa Clara Literature Review to inform and facilitate the continuing diplomatic dialogue through the U.S. and Mexican Sections of the IBWC, rather than for purposes of NEPA compliance. Reclamation's decision to prepare an EIS or a FONSI will be based on the EA's analysis of environmental impacts occurring in the United States as a result of the proposed Pilot Run.

Nothing in this EA or its attachments should be interpreted to conflict with or modify diplomatic positions of the U.S. Any voluntary commitments made by Reclamation with regard to the Bypass Drain or the Cienega are undertaken purely in the interest of international comity and would not constitute any obligation beyond the duration of the proposed YDP Pilot Run.

1.7 Connected Actions

1.7.1 Intentionally Created Surplus Proposal

Although not part of the purpose and need for the Proposed Action, the proposed Pilot Run conserves water in the U.S. by reducing releases from Lake Mead, and affords an opportunity for the creation of Intentionally Created Surplus (ICS) credits. ICS is a program administered by Reclamation in accordance with the 2007 Interim Guidelines. The program provides an opportunity for Colorado River contractors in the Lower Division States to accrue credits from water conservation actions, and to recover the conserved water credits at a later time. The municipal utilities have collectively indicated an interest in partially funding the cost of implementing the proposed Pilot Run in exchange for one-time ICS credits for the water conserved as a result of the proposed Pilot Run (about 29,000 acre-feet AF).

The ICS proposal by the three municipal utilities is considered a connected action to the Proposed Action, since “but for” the Proposed Action, the conserved water would not be available for ICS credits. This EA serves as NEPA compliance for the connected action of any federal approval that would be necessary for potential ICS development.

1.7.2 Joint Report

As described above in section 1.6, and independent of the NEPA process, the U.S. and Mexico, through the IBWC, initiated bi-national consultations regarding the proposed Pilot Run of the YDP. Pursuant to those consultations, nine joint cooperative actions were proposed in the Joint Report, and subsequently approved (see Appendix C). Specifically, as one of these actions, Reclamation intends to operate its systems in a manner that allows the conveyance of 10,000 AF of non-storable Colorado River flows directly into the Wellton-Mohawk Bypass Drain. These non-storable flows are flows that arrive at the U.S.-Mexico border due to limitations in the U.S. system operations. The U.S. conveyance of these flows into the Wellton-Mohawk Bypass Drain will not affect treaty deliveries to Mexico, including monthly allocations and delivery schedules.

Because this Reclamation action is a discretionary federal action, and because it is connected to the proposed Pilot Run (i.e. would not proceed in the absence of the Pilot Run), its environmental impacts in the U.S. are described in this EA.

1.8 Decisions to be Made

This EA will be used to determine if a Finding of No Significant Impact (FONSI) is appropriate. If a FONSI is not appropriate, an Environmental Impact Statement will be necessary before a decision to proceed with the Pilot Run can be made. If a FONSI is appropriate, the YAO Area Manager will determine if proceeding with the Pilot Run is warranted or not, based upon the EA, FONSI, and other pertinent information.

2.0 Alternatives Considered

This chapter presents the alternatives considered for the YDP Pilot Run, including the No Action Alternative. This chapter provides the readers and the responsible official with the specifics of the proposal, displays the alternatives, a comparison of the effects of the alternatives, and any possible mitigation requirements. Alternatives considered, but eliminated from detailed study, are also presented.

2.1 No Action Alternative

Under the No Action Alternative, the YDP would remain in ready reserve mode and a Pilot Run of the process would not occur. Current management plans will continue to guide operation of the Water Quality Improvement Center (WQIC) within the YDP facility. Reclamation would not collect operational data, nor would the YDP function at an operational level adequate to identify remaining design deficiencies. Information regarding actual plant operation, which will test theoretical analysis and provide valuable new information about the plant's operating capability, would not be collected, and testing of the actual plant performance and operating costs, effectiveness of completed plant improvements, and how plant equipment will respond to daily operation would not occur. Process related effluent and emissions data for a sufficient period of time would not be collected, and analysis of potential environmental consequences of YDP operations would not be performed. Finally, Reclamation's ability to develop information necessary to maximize water use efficiency in the LCR system would be compromised.

2.2 Proposed Action

Reclamation proposes to conduct a Pilot Run of the YDP. The YDP is designed to operate in increments of one-third capacity. Therefore, Reclamation proposes to operate the YDP at one-third capacity of the original design for 365 operating days. Such operating days would occur within a minimum of 12 and a maximum of 18 months. This operating duration would provide Reclamation with sufficient time to collect data while the YDP operates in a manner which demonstrates how the plant would likely run on a long-term basis. Pilot Run operation of the YDP would commence with the plant operating at about 11 percent of full capacity, progressing to approximately 22 percent, reaching a maximum of about 33 percent of full capacity and then operating at that level for the remainder of the Proposed Action.

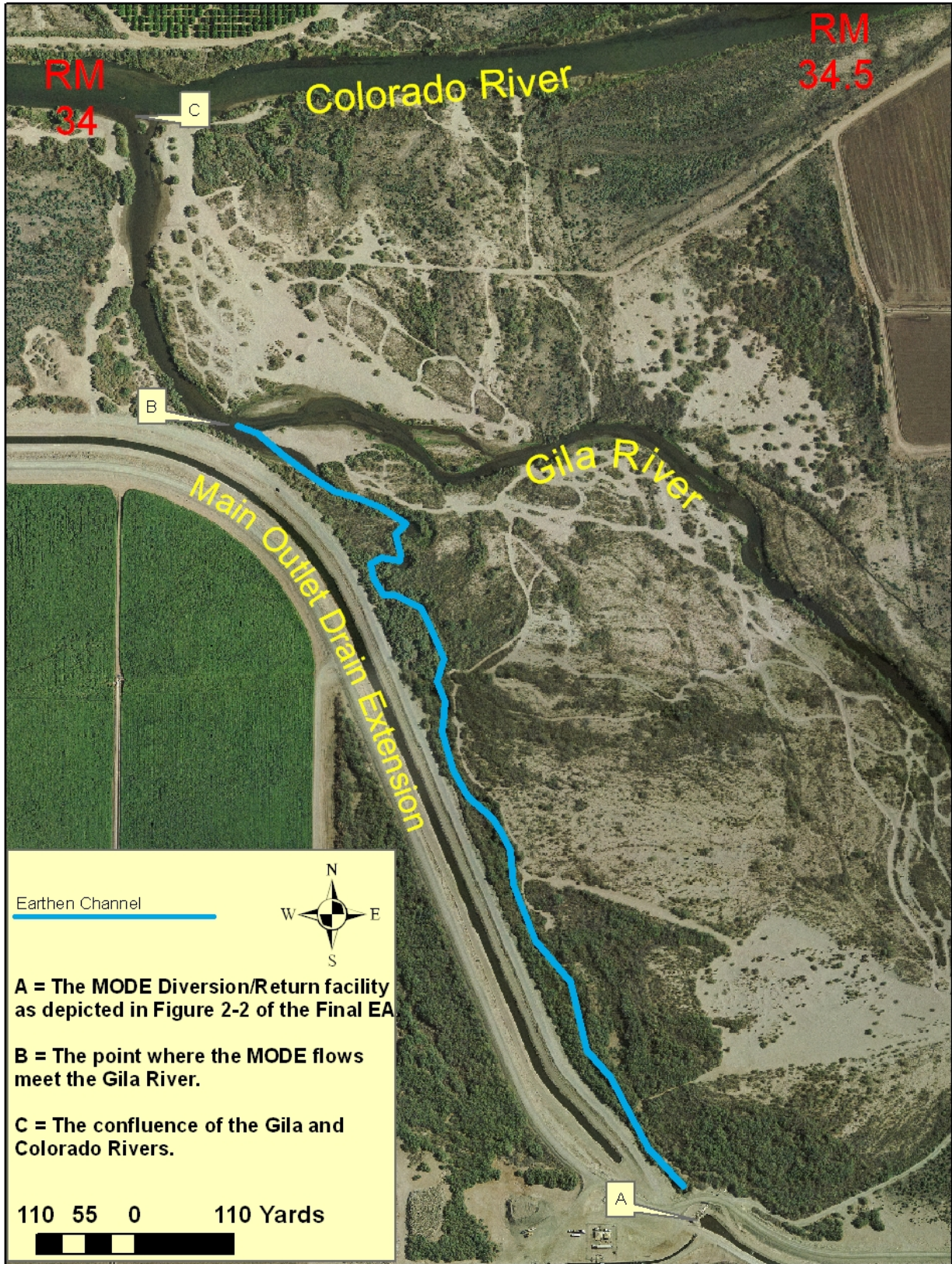


Figure 2-1 The Confluence of the Gila and Colorado Rivers

For the Proposed Action, approximately 7,300 AF of MODE water will be diverted via a diversion structure on MODE 1 near Drainage Pump Outlet Channel (DPOC) 1, as illustrated in Figure 2-1. This diversion structure is a permanent water management facility called Reclamation's "MODE 1 Diversion/Return Facility." Figure 2-2 is a photograph of that facility. The structure discharges into the Gila River Pilot Channel, approximately 400 yards upstream of the confluence with the Colorado River. Based on the historic five year mean salinity of the Bypass Drain flow, the water will have a salinity of approximately 2,664 parts per million (ppm). This salinity value is expressed as ppm of total dissolved solids (TDS) based on sum of constituents method.



Figure 2-2 MODE 1 Diversion/Return Facility

This diversion/return facility is periodically used by Reclamation in routine and on-going water operations associated with water management in the Yuma area, regardless of the operational status of the YDP. For example, from January 2008 through January 2009, Reclamation discharged approximately 457 AF of MODE water to the Colorado River via this facility, which is located approximately 11 miles upstream from the Northerly International Boundary (NIB). Between this facility and the NIB, there are multiple and major return flows and water orders added to the Colorado River. These include water which reaches the river

through the Pilot Knob Power Plant & Wasteway, California Wasteway, Reservation Main Drain, Yuma Mesa Conduit, as well as other conveyances. Figure 2-3 is a diagram of inflows to the Colorado River between Reclamation's MODE 1 Diversion/Return Facility and the NIB.

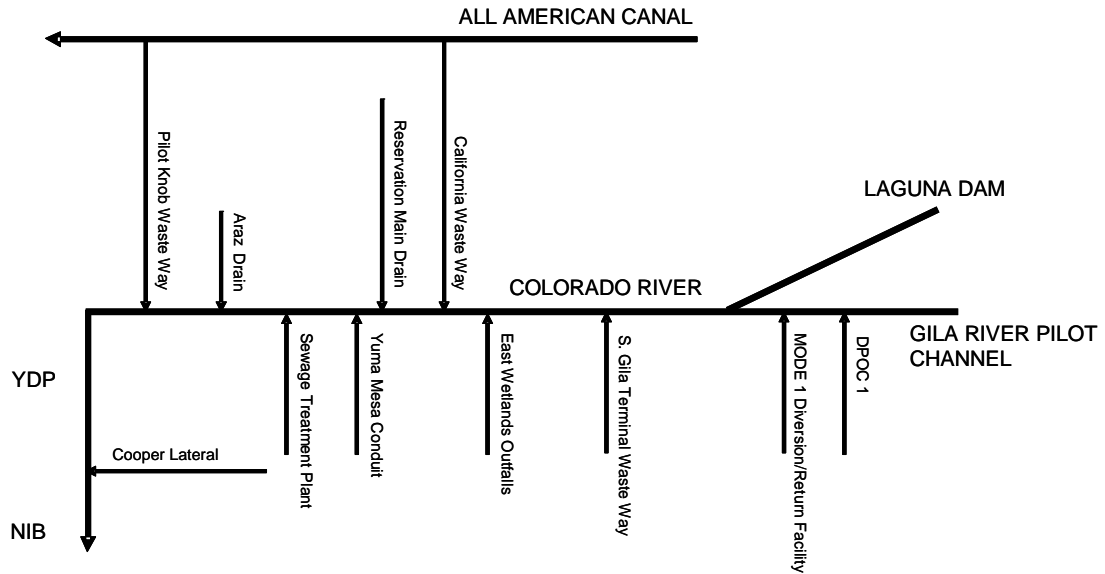


Figure 2-3 Overview of Return Flows and Water Orders to the NIB

The average of volume of water released into the Colorado River channel at Laguna Dam between 1995 and 2008 is about 500,000 AF, with an average salinity of 737 ppm (expressed as TDS). In 2008, flow of about 21,300 AF at 1608 ppm (expressed as TDS), were discharged from DPOC 1. This raised river salinity to an estimated 778 ppm (expressed as TDS). Releasing flows in this manner is an established procedure associated with Reclamation's on-going water management activities in the Yuma area.

Downstream of the MODE 1 Diversion/Return Facility, Reclamation will continue to manage inflows to the Colorado River such that the salinity differential required in the 1944 Water Treaty and appropriate implementing protocol is maintained.

Figure 2-4 provides a summary level water balance diagram for the Proposed Action, and includes a general depiction of how the cooperative actions identified in the Joint Report affect flows into the Bypass Drain.

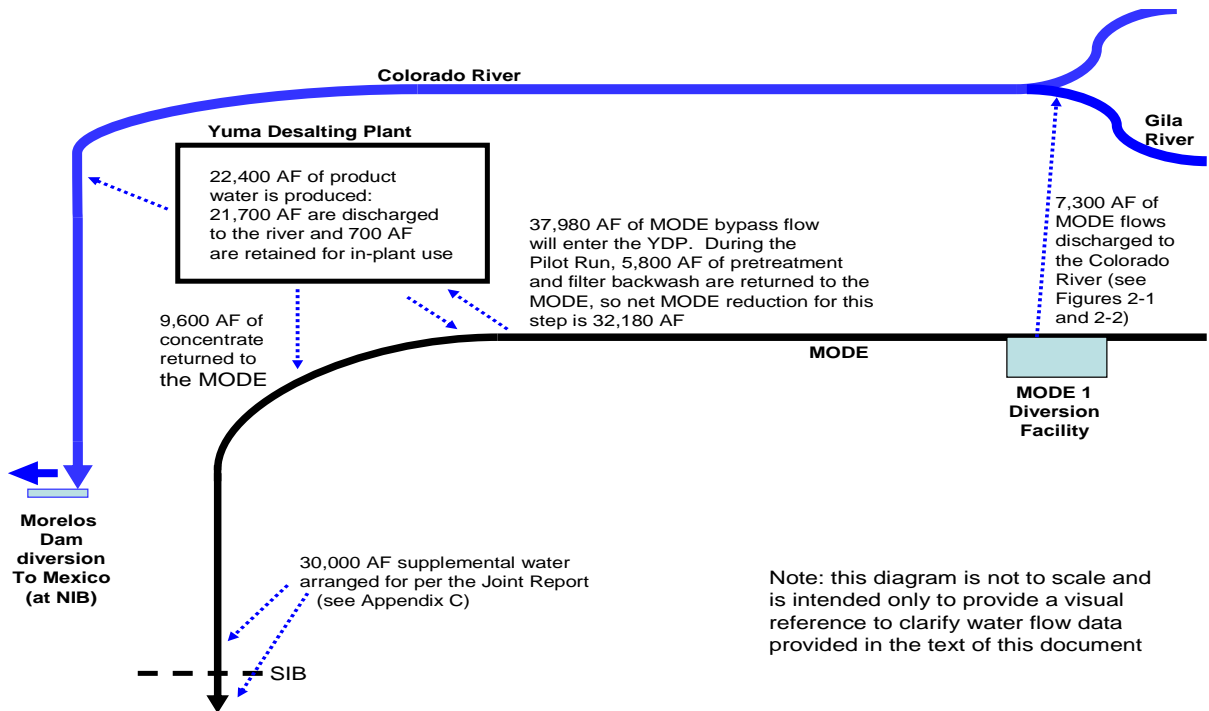


Figure 2-4 Summary Level Water Balance

During the Proposed Action, approximately 104 AF of drainage water from the MODE will be treated daily at the YDP, for a total of approximately 37,980 AF. This process will yield about 61 AF of product water per day (about 22,400 AF total) with a salinity of about 160 ppm (expressed as TDS); 700 AF of this water will be retained for internal YDP use. The remaining 21,700 AF of YDP product water will be discharged into the Colorado River. This desalinated water, and approximately 7,300 AF of MODE flows to be discharged to the Colorado River (as discussed above), would be included in water deliveries to Mexico and therefore is considered part of the annual scheduled allotment of water deliveries to Mexico under the 1944 Water Treaty and appropriate implementing protocol. The total amount of water sent to the Colorado River is 29,000AF (21,700AF of desalinated water plus 7,300AF of MODE flows) at 790 ppm (expressed as TDS).

Downstream of the YDP, Bypass Drain flows during the Proposed Action would be approximately 77,017 AF of water with an estimated salinity of 3,204 ppm (expressed as TDS). The Bypass Drain flow at the Southerly International Boundary (SIB) over the past 5 years (2004-2008) has averaged approximately 106,897 AF per year with a salinity of 2,664 ppm (expressed as TDS).

The volume and salinity of the Bypass Drain flows at the SIB are calculated as follows:

	Volume (AF)	Salinity (ppm) (expressed as TDS)
Average MODE flow absent the Pilot Run	106,897	2,664
Feed water into the YDP	- 37,980	2,664
MODE water to the River	- 7,300	2,664
Concentrate from the YDP	+ 9,600	7,230
Pretreatment/filter backwash returned to MODE	<u>+ 5,800</u>	<u>2,280</u>
TOTAL	77,017	3,204

In summary, as a result of the Pilot Run, the expected reduction in the Bypass Drain flow at the SIB would be approximately 29,880 AF with an increase in salinity of about 540 ppm (expressed as TDS).

Byproducts of the YDP desalination include concentrate and biosolids. Concentrate consists of water and salts which have been removed during the desalination process. During the Proposed Action, concentrate is expected to total about 9,600 AF, or approximately 26 AF per day. The concentrate will be discharged to the MODE, where it will blend with the remaining drainage water flowing in the MODE. The biosolids produced by the YDP are composed primarily of water and calcium carbonate. The amount of biosolids produced during the proposed Pilot Run is expected to total about 190 AF. The biosolids produced will be piped through the existing A-22 pipeline and disposed of in existing evaporative, lined disposal cells southeast of the YDP.

Although not part of the Proposed Action, and as a result of voluntary bi-national consultations through the IBWC, the Joint Report indicates that the United States, Mexico, and a partnership of non-governmental organizations will each arrange for 10,000 AF of water to be diverted to the Bypass Drain. This will total 30,000 AF of flows diverted to the Bypass Drain as arranged per the Joint Report. Please see Appendix C for a copy of the Joint Report and other associated documents.

2.2.1 Description of the YDP Process

Although some equipment in the YDP has changed since its original construction (e.g., instrumentation has been updated), its purpose, fundamental design and water treatment process remain the same as when it was constructed. A generalized schematic of the YDP's water treatment process is presented in Figure 2-5. Water enters the facility, is treated to remove particulates, and then filtered to produce product water. A more detailed description of the pretreatment and reverse osmosis (RO) processes at YDP follows.

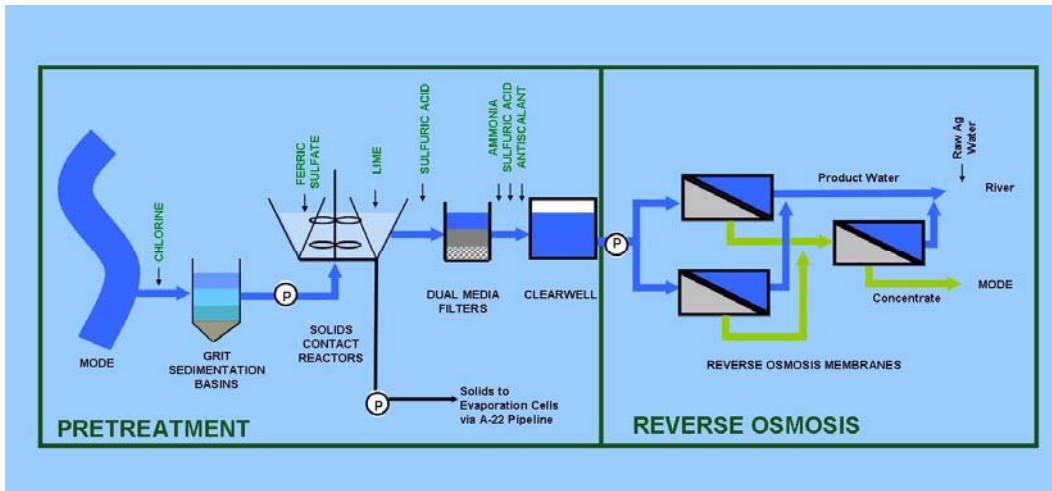


Figure 2-5 Generalized Schematic of YDP Process

The pretreatment process begins with raw feed water from the MODE passing through trash racks to prevent large debris from entering the system. Feed water is then dosed with chlorine to halt the growth of algae and microorganisms. The pretreatment process continues in the grit sedimentation basins, where the water flow is slowed to allow large particulate matter to settle out. Next, the feed water is pumped to the solids contact reactor (SCR). In the SCR, ferric sulfate and lime are added which result in coagulation and flocculation. These chemical processes cause any particulate in the water to drop to the floor of the SCR. Treated water from the SCR travels to dual media filters (DMFs) where any remaining particulate matter in the water is removed. The media filters utilize sand and anthracite coal. Water from the DMFs is dosed with ammonia, sulfuric acid and anti-scalant prior to reaching the clearwell. Ammonia converts remaining chlorine in the water to chloramines in order to protect the RO membranes. Sulfuric acid is utilized to adjust the pH for optimal conditions for RO. Anti-scalant helps prevent scale from forming on the RO membranes.

Pretreated water is stored in the clearwell. This water is particulate free, but still saline. The dissolved salts are removed by RO. Water under pressure is applied to semi-permeable membranes allowing the pure solvent (in this case the YDP product water) to pass from the filter. The product water is then transported via gravity through 2,830 feet of concrete-lined canal, and discharged into the Colorado River. The concentrate flow is discharged from the YDP into the MODE via an underground pipe originating at the YDP. These flows then proceed down the Bypass Drain, a concrete-lined canal, to the SIB. From that point, all flows in the Bypass Drain are then under the exclusive jurisdiction of Mexico.

2.3 Alternatives Considered, but Eliminated From More Detailed Study

2.3.1 Alternate Product Water Discharge

Reclamation considered the alternative of discharging the product water into the MODE. This alternative was eliminated from further review because it did not meet the purpose and need statement of operating the YDP under actual designed operating conditions. Specifically, discharging water into the Colorado River would be part of actual operating conditions, and as such, this alternative would not meet the criteria. Furthermore, while the Proposed Action is primarily intended to provide benchmark data which can only be obtained through sustained plant operation, this alternative would result in approximately 29,000 AF of water not being available for beneficial use in the U.S. during an unprecedented drought.

2.3.2 Pilot Run at Reduced Capacity

Reclamation considered running the YDP at ten percent capacity for a period of 365 operational days during 12 to 18 months. Operating at this level would demonstrate that the YDP can operate. However, the YDP was designed and constructed to operate in increments of one-third capacity. Accurate operational data could not be collected if the YDP ran only at ten percent. Certain equipment can run at less than one-third capacity, as shown in the 90-day demonstration run. However, running the YDP at only ten percent for an extended period of time is not cost effective because each of the SCRs must still run at 33 percent. Accordingly, a ten percent run would not provide the accurate cost data regarding YDP operation. Therefore, this alternative was eliminated from further review because it did not meet the purpose and need statement of operating the YDP under actual designed operating conditions.

2.3.3 Pilot Run for a Shorter Duration

Reclamation considered running the YDP at one-third capacity for fewer operating days over a shorter duration. Operating at this level would allow operating the YDP as designed, but would reduce amounts of product water, concentrate and biosolids. However, this alternative would result in insufficient operating time to test changes and corrections that have already been implemented at the YDP to determine if additional corrective actions to the plant are needed, and to gather process related effluent and emissions data. Additionally, a shorter duration does not cover seasonal variation when chemical use and power consumption are highly variable. Therefore, this alternative was eliminated from further review because it did not meet the purpose and need statement of operating the YDP to provide benchmark cost and performance data for a duration which is representative of commercial scale.

2.3.4 Use of Groundwater as YDP Feed Water

Reclamation considered utilizing groundwater from the Yuma Valley instead of WMIDD drainage water to operate the YDP during the Pilot Run. Operating the

YDP using groundwater from the Yuma Valley would allow the YDP Pilot run to operate at one-third capacity for 365 operating days during a 12 to 18 month period. However, this alternative was eliminated from further review because it would not meet the purpose and need of operating the YDP as designed. The YDP was designed with the necessary appurtenant works to treat highly saline WMIDD drainage water. Running the YDP using lower saline groundwater flows (ranging between 1,500 ppm to 1,800 ppm [expressed as TDS]) from the Yuma Valley would not meet the purpose of verifying the suitability of the YDP pre-treatment processes. In addition, pursuant to Minute 242, drainage water from the WMIDD is not counted towards Mexico's allocation (as delineated in the 1944 Water Treaty). While groundwater will not be used during the Proposed Action, Reclamation will continue to work with the State of Arizona and other interested stakeholders regarding the potential, future use of groundwater from the Yuma Valley Area as a feed source for the YDP.

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3.0 Affected Environment and Environmental Consequences

This section summarizes the existing condition of the project area and the scientific and analytic basis for comparing the potential direct, indirect, and cumulative effects on the environment as a result of the Proposed Action and No Action Alternative.

3.1 Introduction

Resources and issues included for detailed analysis were identified in accordance with Council on Environmental Quality (CEQ) NEPA regulations to "...identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review..." (40 CFR 1501.7(a)(3)).

3.1.1 Eliminated from Further Detailed Analysis

The following subsections summarize the resource areas which are not affected by the Proposed Action, and therefore are not included for detailed analysis in this EA.

3.1.1.1 Aesthetics

The YDP is currently built and no new construction will occur as a result of the Proposed Action. Therefore, implementation of the YDP Pilot Run will not change the existing visual character or quality of the site and its surroundings. Therefore, aesthetics are not included for further detailed analysis in this EA.

3.1.1.2 Cultural Resources

There were no known archeological or historical sites found on or near the YDP during construction. There will be no change to historical, archeological, or paleontological resources as a result of the Proposed Action. Reclamation archaeologists have reviewed the Proposed Action and concur that no further evaluation is necessary. Therefore, cultural resources are not included for further detailed analysis in this EA.

3.1.1.3 Geology and Soils

No substantial change has occurred to the geology of the area since construction of the YDP. No new construction will occur as a result of the proposed Pilot Run. Reclamation geologists have determined that the Proposed Action would not contribute to substantial soil erosion, landslides, subsidence, liquefaction, or collapse. Therefore, geology and soils are not included for further detailed analysis in this EA.

3.1.1.4 Land Use

This issue was eliminated from further detailed study because it is outside the scope of the Proposed Action. The proposed YDP Pilot Run will not result in a change to

designated land use nor will it affect any recreational opportunities. Therefore, land use is not included for further detailed analysis in this EA.

3.2 Included for Further Analysis

The environmental resources and issues discussed in the following sections were determined to require further analysis to evaluate the potential for significant effect.

3.3 Air Quality

In accordance with the *Clean Air Act* (CAA), as amended (EPA 1990), federal and state governments have established ambient air quality standards for the protection of public health. Chlorine and anhydrous ammonia are two listed substances regulated by the CAA that would be used during the Proposed Action. Reclamation proposes to increase the amount of chlorine and anhydrous ammonia currently used and stored on-site for the proposed Pilot Run. This section presents the current environmental conditions in the project area and the analysis of potential effects associated with the Proposed Action upon local and regional air quality.

3.3.1 Affected Environment

3.3.1.1 Climate and Meteorology

The region has an arid continental climate, which is characterized by hot summers, mild winters, low humidity, and large diurnal variations in temperature. The aridity of the region is due to a combination of factors, including (1) the presence of a semi-permanent atmospheric high pressure system that shields the region from the passage of polar storm systems, (2) a cool ocean to the west that provides limited amounts of moisture, and (3) the rain shadow effects of the Coast Ranges, which block the flow of moisture into the region from the Pacific Ocean. This arid condition is responsible for the main air pollution problem in the region, fugitive dust.

3.3.1.2 Existing Conditions

The primary air pollutant of concern in Yuma County is PM₁₀. PM₁₀ is defined as particulate matter that is 10 microns in diameter or less. It is mostly composed of dust particles, sulfate, and nitrates. PM₁₀ is a byproduct of fuel combustion and wind erosion of soil and unpaved roads, and is directly emitted into the atmosphere through these processes. Currently, Yuma County is designated as a non-attainment area for PM₁₀ by state and federal statutes (ADEQ 2009b). Due to a large thunderstorm, the Environmental Protection Agency (EPA) required ADEQ to develop a Natural Events Action Plan. It was developed and submitted to EPA on August 17, 2005. Subsequently, ADEQ submitted the *Non-attainment Areas and Attainment Areas within Maintenance Plans* (ADEQ 2009b) for the re-designation of the Yuma area as an attainment area for PM₁₀. The maintenance plan is still pending approval.

Ozone in the lower atmosphere is one of the main components of smog. Ozone is formed in the atmosphere from a combination of nitrogen oxides and volatile organic compounds in the presence of sunlight. On April 15, 2004, the EPA issued final area designations for the state of Arizona. The Yuma area is considered an attainment/unclassifiable area for 8-hour ozone (ADEQ 2009a). In 2008, EPA revised the ozone standard and lowered the previous 8-hour standard from 0.08 ppm to 0.075 ppm. ADEQ developed a Technical Support Document to explain the recommendation to EPA on what revisions, if any, need to be made to the boundaries for the ozone non-attainment area to address the new 2008 standard. This document was sent to the Governor of Arizona for final approval and then submitted to EPA Region 9 in March 2009. The EPA has not yet recommended a final designation for the Yuma area (ADEQ 2009a).

Chlorine and anhydrous ammonia are not naturally occurring particulate matter in the Yuma area, and are not regulated as such by the ADEQ. They do, however, have the possibility to affect air quality and so will be discussed.

3.3.2 Environmental Consequences

3.3.2.1 No Action Alternative

Under the No Action Alternative, amounts of chlorine and anhydrous ammonia would not need to be increased. The quantities of both chemicals on site would continue to be below regulatory thresholds. Therefore, the No Action Alternative will not result in a change to existing compliance under the CAA, nor increased potential for adverse effect in the event of a release of chlorine or anhydrous ammonia.

3.3.2.2 Proposed Action

As discussed in Section 3.3.1, the Proposed Action is located in a non-attainment area for fugitive dust (i.e., PM₁₀), but an attainment/unclassifiable zone for ozone. PM₁₀ emissions will increase due to the Proposed Action. Increased visits to the facility from new employees and material deliveries will add PM₁₀ from vehicle exhaust. The estimated increase is approximately 7.7 tons per year. This estimated increase is well below the de minimus standard of 100 tons per year threshold established for the non-attainment area.

Due to the minimal increase in vehicle use, and short time frame for the Proposed Action, effects due to ozone increases are expected to be negligible. No objectionable odors are anticipated to be caused by the proposed YDP Pilot Run.

Chlorine and anhydrous ammonia are two listed substances regulated by the EPA under the CAA that will be used during the Proposed Action, and which will be on-site in threshold quantities which trigger additional compliance under the CAA (implementation of management and mitigation measures as outlined in the Resource Management Plan (RMP) and Process Safety Management Plan (PSMP)). These two substances are also classified as hazardous materials, and a detailed discussion of issues relating to chlorine and anhydrous ammonia is provided in Section 3.6.2.2.

3.3.3 Management and Mitigation Measures

The RMP process includes analysis of off-site consequences to the public and the environment from an accidental release. Process controls and prevention measures relating to any emergency management issues are fully outlined in the RMP/PSMP. Reclamation will follow all best management practices (BMPs) as outlined in the RMP/PSMP. No mitigation measures are necessary to reduce PM₁₀ or ozone emissions.

3.4 Biological Resources, Including Threatened & Endangered Species

This section presents the existing conditions related to biological resources in the project area and discusses the potential effects to threatened and endangered species.

3.4.1 Affected Environment

3.4.1.1 Terrestrial Setting

The YDP is located within the Yuma Valley which consists primarily of agricultural croplands with a network of irrigation drains and ditches, and several residential areas throughout the area.

Vegetation and Wildlife

Vegetation in the vicinity is located along the Colorado River corridor. Salt cedar (*Tamarix spp.*) is the dominant vegetation along the LCR. Other types of vegetation include a mix of cottonwood (*Populus fremontii*), Goodding's willow (*Salix gooddingii*), honey mesquite (*Prosopis glandulosa* var. *torreyana*), screwbean mesquite (*Prosopis pubescens*) and common reed (*Phragmites australis*). Various shrubs are found on higher, drier areas, such as arrowweed (*Pluchea sericea*), quailbush (*Atriplex lentiformis*), salt bush (*Atriplex canescens*), and creosote (*Larrea tridentata*).

The Bypass Drain is a concrete lined canal which conveys agricultural return flows from the Wellton-Mohawk Valley past the YDP across the SIB where it then continues approximately 35 miles into Mexico, terminating with the northern end of the Cienega. This canal is directly adjacent to the flood control levee, along the east side of the Limitrophe (the 23-mile segment of the lower Colorado River that serves as the international boundary between the U.S. and Mexico). The Bypass Drain has limited habitat value for fish or wildlife, as emergent vegetation is limited or absent. Any vegetation that grows in the Bypass Drain is regularly removed through normal Reclamation maintenance efforts.

The areas directly adjacent to the Bypass Drain are described as agricultural lands, lower Sonoran Desert scrub, and riparian habitat found along the bank of the Colorado River. The Bypass Drain corridor may contain habitat for a number of small mammals and reptiles, burrowing owls, and other wildlife species. The surface of the land directly adjacent to the Bypass Drain has been heavily disturbed and is mostly void of vegetation, limiting the quality of habitat for wildlife. Maintenance efforts by Reclamation, frequent

use of vehicles on routes along both banks of the Bypass Drain, and lack of native vegetation limits the quality and quantity of wildlife habitat along the Bypass Drain's alignment.

The riparian areas of the Colorado River provide valuable stopover habitat for migratory birds, as well as a host of mammals and reptiles. Upland vegetation, and to some extent agricultural areas, can provide habitat for other mammals.

3.4.1.2 Special Status Species

Federally listed threatened or endangered wildlife species potentially occurring in the project area were identified using information from the U.S. Fish and Wildlife Service (USFWS), which lists endangered species by county. The analysis area is defined by what is commonly referred to as the Limitrophe Division of the LCR and is also designated as Reach 7 in the LCR Multi-Species Conservation Program (MSCP) Habitat Conservation Plan (HCP). The Limitrophe Division is the portion of the Colorado River that extends from the NIB downstream to the SIB. River conditions below Morelos Dam to the SIB are frequently dry, or nearly so. Flow, when present in this reach, is maintained by seepage and releases from Morelos Diversion Dam, irrigation return flows, canal wasteway discharges, and groundwater discharge (LCR MSCP HCP 2004).

A total of six federally-listed candidate, threatened, or endangered species were identified and include the following: brown pelican (*Pelecanus occidentalis*), razorback sucker (*Xyrauchen texanus*), Sonoran pronghorn (*Antilocapra americana sonoriensis*), Southwestern willow flycatcher (*Empidonax traillii extimus*), Yuma clapper rail (*Rallus longirostris yumanensis*), and yellow-billed cuckoo (*Coccyzus americanus*). The bald eagle (*Haliaeetus leucocephalus*) is no longer federally listed, but remains protected under the *Bald and Golden Eagle Protection Act*, and is included in this section.

Only three wildlife species that are federally and state listed are known or have the potential to occur along the Limitrophe Division. These species are the Yuma clapper rail (*Rallus longirostris yumanensis*), the Southwestern willow flycatcher (*Empidonax traillii extimus*), and the yellow-billed cuckoo (*Coccyzus americanus*).

Yuma Clapper Rail

The Yuma clapper rail was listed as a federal endangered species on March 11, 1967. The Yuma clapper rail, one of seven North American subspecies of clapper rails, occurs primarily along the LCR in California and Arizona. It is a fairly common summer resident from Topock, Arizona, south to Yuma, Arizona (Anderson 1983). Critical habitat has not been designated for this subspecies.

In the U.S., the Yuma clapper rail is associated primarily with freshwater marshes, with the highest densities of this subspecies occurring in mature stands of dense to moderately dense cattails and bulrushes. The Yuma clapper rail begins nesting activities by February. Young typically hatch early in June and suffer high mortality from predators in their first month of life (Rosenberg et al. 1991). Crayfish are the primary food source of

this subspecies along the LCR and may be a limiting factor restricting rail occurrence (Ohmart and Tomlinson 1977; Eddleman 1989).

The Yuma clapper rail is threatened by the lack of natural river processes which create and maintain marshes (USFWS 2006). Other threats are from wildfires and environmental contamination caused by selenium (AGFD 2006).

Surveys conducted by the Arizona Game and Fish Department (AGFD) over the past years show that Yuma clapper rails are located throughout the Limitrophe Division at various locations [i.e., Hunters Hole (approximate River Mile (RM) 2.5) and areas immediately below Morelos Dam].

Southwestern Willow Flycatcher

The USFWS listed the southwestern willow flycatcher as an endangered species on February 27, 1995, and published the final designation for critical habitat on October 19, 2004. Reach 7 (NIB to SIB) of the LCR was not included in the area designated as critical habitat for this species. The southwestern willow flycatcher is also designated as a wildlife species of special concern by the AGFD.

Southwestern willow flycatchers are neo-tropical migrants which were once widespread and locally common throughout riparian areas of the arid Southwest. Their historical breeding distribution included southern California, southern Nevada, southern Utah, Arizona, New Mexico, and western Texas (Hubbard 1987; Unitt 1987; Browning 1993).

Throughout its range, the southwestern willow flycatcher is a riparian obligate insectivore which breeds in summer along rivers, streams, and other wetlands where dense willow, cottonwood, salt cedar, or other similarly structured riparian vegetation occurs (USFWS 2002, 1995; AGFD 2005). Along the LCR, southwestern willow flycatchers begin nesting in May and continue through July (McKernan and Braden 2001). They nest in riparian vegetation characterized by low, dense shrubs, such as native willows and non-native salt cedar, usually with a sparse to dense overstory of Fremont cottonwoods or Goodding's willows; water or moist soil is usually present beneath the canopy (McKernan and Braden 2001).

Sites near the YDP where southwestern willow flycatchers were detected but not confirmed breeding in 1996, 1997, 1999, 2001, or 2002 include the Gila/Colorado River confluence, Gadsden (RM 6.4), Gadsden Bend (RM 7.0), and Hunter's Hole (McKernan 1997; McKernan and Braden 2001).

The loss and modification of habitat associated with the operation of dams and reservoirs, water diversion and groundwater pumping, channelization and bank stabilization, livestock grazing, recreation, fire, and urban and agricultural development have been identified as the primary threats affecting the southwestern willow flycatcher. Other secondary threats of equal importance are the introduction of exotic species and brood parasitism.

Yellow-Billed Cuckoo

The yellow-billed cuckoo is a USFWS candidate species for listing under the *Endangered Species Act* (ESA) and is a wildlife species of special concern in Arizona (AGFD 2005a). Yellow-billed cuckoo in the western U.S. are limited to narrow, and often widely separated, riparian cottonwood-willow galleries. Yellow-billed cuckoo use mature stands of cottonwood and willow along the lower Colorado River Valley and, to a lesser extent, also use a mix of cottonwoods, willows, and mesquite (Rosenberg et al. 1991). Foraging yellow-billed cuckoo may use smaller mesquite and salt cedar (Rosenberg et al. 1991). The loss, degradation, and fragmentation of riparian habitat have been identified as the primary factors causing yellow-billed cuckoo declines in the western states.

The yellow-billed cuckoo arrives on its breeding grounds in mid- to late-June and departs by the end of August, spending only about one quarter of its annual cycle on its breeding territory.

Yellow-billed cuckoo surveys have been conducted in the Limitrophe Division since 2005. Gadsden Bend and Hunter's Hole are two localities known to harbor yellow-billed cuckoo (LCR MSCP HCP). Cuckoo have been detected in these areas; however, no breeding evidence has been found. During the 2008 survey period, one yellow-billed cuckoo was detected in the Gadsden Bend area [Haltermann et al. 2009 (in press)].

3.4.2 Environmental Consequences

3.4.2.1 No Action Alternative

Under the No Action Alternative, the YDP would not operate at one-third capacity. Therefore, the No Action Alternative will not result in adverse effects to wildlife, vegetation, or endangered species.

3.4.2.2 Proposed Action

During operation of the Proposed Action, no new construction is proposed, and operating activities will be confined to existing facilities. The temporary discharge of product water into the Colorado River above Morelos Dam will continue to meet the provisions for salinity set forth in Minute 242, and will have no effect on the Yuma clapper rail, southwestern willow flycatcher, or the yellow-billed cuckoo, as protected under the ESA in the U.S. Product water will meet Arizona Pollutant Discharge Elimination System (AZPDES) standards. There will be no affect to vegetation or wildlife along the Colorado River below Morelos Dam because there will be no change in U.S. water operations at that location. Water delivered via the Colorado River to Morelos Dam will still be delivered in quantity and quality as described under current agreements.

The Proposed Action could result in reduced releases from Hoover Dam. Rather than water being released from Hoover Dam, treated water would be utilized from the YDP. Reduced releases could result in slightly lowered river elevation, decrease the amount of open water and decrease backwater areas in the lower Colorado River between Hoover and Imperial Dams. However, it is anticipated that these effects would be so small as to

be practically immeasurable. Accordingly, reduced Colorado River flows between Hoover and Imperial Dams would have indiscernible biological impacts⁴. Specific to the Yuma and Laguna Divisions, the Proposed Action would not reduce flows in these reaches of the Colorado River. Water delivered to Mexico at Morelos Dam is diverted at Imperial Dam and is conveyed through the first portion of the All-American Canal before being returned via the Pilot Knob Wasteway to the Colorado River just upstream of Morelos Dam. Accordingly, the reduction in flow associated with the project would not affect these reaches of the Colorado River.

As background, it should be noted that the LCR MSCP (LCR MSCP Biological Assessment, Vol. III) and the Biological Opinion for that action provide ESA coverage for the change in point of diversion of up to 1.574 million AF. Habitat based mitigation measures were developed and are being implemented for potential habitat losses associated with reductions in Colorado River flow associated with such changes in point of diversion. In addition, the creation of ICS credits resulting from the Pilot Run, for later delivery by the three municipal utilities, is considered a flow related covered activity as defined in the MSCP. Moreover, the storage and later delivery of up to 2.1 million AF was described in the EIS for the Interim Guidelines (2007) (see Section 1.7.1, Intentionally Created Surplus Proposal).

The reach of the Colorado River directly affected by the proposed Pilot Run would be between the MODE 1 Diversion/Return facility and Morelos Dam. The addition of 7,300 AF of water over 12 to 18 months at this location will result in an immeasurably small increase in Colorado River level. Moreover, conveyances via the MODE 1 Diversion/Return facility from DPOC 1 are an established procedure, and occur when maintenance is required. For example, in 2008, 436,473 AF of water was released into the Colorado River channel at Laguna Dam, with a salinity of 737 ppm (expressed as TDS). Flows were also discharged from DPOC 1 (21,362 AF at 1608 ppm), which raised Colorado River salinity to an estimated 778 ppm (expressed as TDS). During the Proposed Action, about 7,300 AF of water at 2,664 ppm (expressed as TDS) from Reclamation's MODE 1 Diversion/Return Facility would increase Colorado River salinity 30 ppm (expressed as TDS) to 808 ppm (expressed as TDS). A 30 ppm (expressed as TDS) increase in salinity to 808 ppm (expressed as TDS) total salinity is within normal operations and is not expected to cause any impact to the flora or fauna of the Colorado River either at this location or downstream.

Resident fish species will not be affected by the estimated increase in salinity. Largemouth bass (*Micropterus salmoides*), bluegill (*Lepomis macrochirus*), and channel catfish (*Ictalurus punctatus*), common game fish found in the Colorado River, can tolerate salinities well above 808 ppm (expressed as TDS). Courtenay and Roberts (1973) reported salinity tolerance of 12.5 g/L (12,500 ppm) for Largemouth bass.

⁴ It should be noted that if the ICS proposal is approved, later delivery of the conserved water from Lake Mead to Lake Havasu (where diversions would be made to two of the three ICS participants) would significantly offset these minor reductions.

Bluegill have a 14 day LC50 (lethal concentration that will kill 50% of the affected population) of 14.5 g/L (14,500 ppm) as reported by Reed and Evans (1988). Stickney and Simco (1971) reported long-term survival of channel catfish in ocean waters of 12 g/L (12,000 ppm). Therefore, an increase in approximately 30 ppm (expressed as TDS) will not cause negative effects to fisheries along the project area.

Vegetation in this reach will not be affected by the estimated increase in salinity. Common reed (*Phragmites australis*) and salt cedar (*Tamarix spp.*) dominate the vegetation along the Colorado River's corridor between the MODE 1 Diversion/Return Facility and Morelos Dam. Both of these species are highly salt tolerant, therefore a 30 ppm (expressed as TDS) increase in salinity along this stretch would not cause negative effects to this vegetation along the Colorado River. Growth by cottonwood (*Populus fremontii*) and Goodding's willow (*Salix gooddingii*) is inhibited by salinity greater than 1,500 ppm, whereas salt cedar can tolerate soil salinity up to 36,000 ppm (Jackson et al. 1990). Therefore, a 30 ppm (expressed as TDS) increase in salinity to 808 ppm (expressed as TDS) is not likely to cause negative effects to vegetation along the project area.

Razorback sucker and Sonoran pronghorn do not occur in the area of the Proposed Action and would not be affected. The Proposed Action would not affect the brown pelican and bald eagle because the dry river bottom, small pools, and small flowing water habitat that is adjacent to the proposed project are not affected and are not the preferred habitat of these species. They are more likely to be found in backwaters and impoundments than river habitats.

Reduced flows and increased salinity in the Bypass Drain would result from implementation of the Proposed Action. No adverse effects to vegetation and wildlife resources within the U.S. would result due to the lack of flora and fauna found within the Bypass Drain. This EA does not address impacts in Mexico, as stated in Section 1.6, International Considerations.

Outside the context of NEPA, pursuant to international consultations, a Joint Report has been issued, which indicates that the U.S., Mexico, and a partnership of non-governmental organizations will each arrange for 10,000 AF of water to be diverted to the Bypass Drain. This will total 30,000 AF of flows diverted to the Bypass Drain. These voluntary actions, undertaken purely in the interest of international comity, pursuant to IBWC consultations, will have the effect of providing flows as arranged per the Joint Report. Please see Appendix C for a copy of the Joint Report and other, associated documents.

Noise associated with operation of the YDP is not higher than ambient noise levels and would not have adverse effects to wildlife.

3.4.3 Management and Mitigation Measures

No flora or fauna in the U.S. will be adversely affected by the Proposed Action, therefore no management or mitigation measures will be necessary.

3.5 Water Resources

This section presents the existing conditions related to water resources in the project area and discusses the potential effects to surface water, water quality, and groundwater.

3.5.1 Affected Environment

3.5.1.1 Surface Water

Surface water associated with the Proposed Action primarily is comprised of the LCR above Morelos Dam and below the confluence of the Gila and Colorado Rivers. As shown in Figure 3-1, the specific study area is located adjacent to and downstream from the YDP point of discharge, within the Yuma and Limitrophe Divisions, respectively.⁵ The Yuma Division begins below Laguna Dam and extends 19 miles downstream to the NIB (immediately above Morelos Dam). The Limitrophe Division extends from the NIB, just above Morelos Dam, approximately 23 miles downstream to the SIB. The Limitrophe Division forms the international boundary between Arizona (U.S.) and Baja California (Mexico).

Morelos Dam is operated and maintained by Mexico, pursuant to the 1944 Water Treaty and appropriate implementing protocols. Mexico diverts the majority of its Colorado River water supply at Morelos Dam. Once Colorado River water reaches Mexico, the water is under the exclusive jurisdiction of Mexico. Average historical total flows estimated in the Limitrophe Division are 22,000 AF in non-flood years and 2,120,000 AF in flood years (U.S. Department of Interior et al. 2004). These flows are the result of seepage from Morelos Dam, flow releases from Morelos Dam (flood flows and excess water not diverted by Mexico), irrigation return flows from Mexico, canal wasteways in the U.S., and groundwater accumulation from both the U.S. and Mexico (U.S. Department of Interior et al. 2004). Standing surface water throughout the 23 miles of the Limitrophe Division is uncommon.

Although volumes delivered during shortages and surpluses may vary, during normal years at least 1.5 million AF of Colorado River water is delivered to Mexico, in accordance with Article 10 of the 1944 Water Treaty and appropriate implementing protocols. Two delivery points exist, one at the NIB, just north of Morelos Dam, and the other at the SIB. It is at these points that U.S. jurisdiction of these waters terminates.

5. The LCR MSCP Habitat Conservation Plan uses Reach 6 (Yuma Division) and Reach 7 (Limitrophe Division) to identify these sections of the Colorado River.

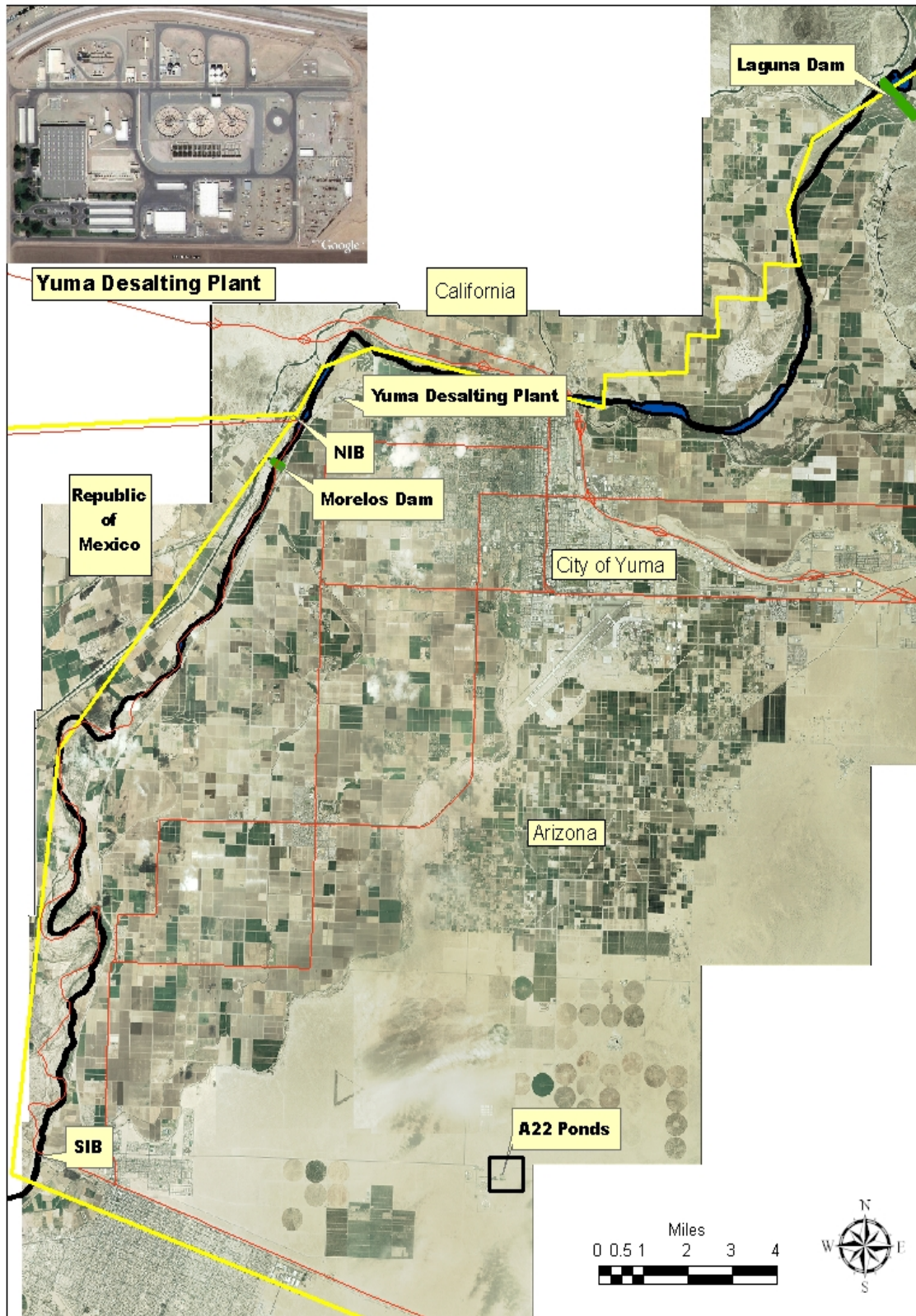


Figure 3-1 Water Resources Analysis Area

Other surface water consists of that existing in canals, drains and other infrastructure in the Yuma area. Drainage water from the WMIDD is agriculture return flow and is not a water of the U.S as defined in the *Clean Water Act* (CWA). This drainage water and groundwater from the WMIDD are pumped into the Wellton-Mohawk Main Conveyance Channel, where it is then transported via gravity into the MODE and into Mexico via the Bypass Drain. The amount of water being delivered to Mexico via the Bypass Drain is not counted against the 1944 Water Treaty allotment, and there is no commitment by WMIDD or others to continue to provide water to the Bypass Drain. Average drainage flows in the Bypass Drain at the SIB are estimated to be approximately 106,897 AF annually (2004-2008 average). During this period, the flow has ranged from between about 99,000 AF and 115,000 AF. This range is primarily due to variations in agricultural practices in the WMIDD.

3.5.1.2 Water Quality

Salts in the Colorado River are naturally occurring and persistent. Generally, salinity concentrations are influenced by the volume of river flow. For example, salinity concentrations will drop when Colorado River flow is at high levels. Conversely, salinity levels will increase during periods of drought. During the last five years, the salinity concentrations in the Colorado River have increased due to drought. In addition, irrigation drainage from agricultural uses has contributed to salinity concentrations. However, LCR salinity levels overall remain relatively low. Minute 242 states, “[t]he United States shall adopt measures to assure that ... the [water] delivered to Mexico upstream of Morelos Dam, have an annual average salinity of no more than 115 p.p.m. ± 30 p.p.m. U.S. count (121 p.p.m. ± 30 p.p.m. Mexican count) over the annual average salinity of Colorado River waters which arrive at Imperial Dam...” (Minute 242 1973).

Though waters in the MODE or Bypass Drain are agricultural return flows and thus are not waters of the U.S., salinity in the Bypass Drain generally is approximately 2664 ppm (expressed as TDS).

In accordance with the National Pollutant Discharge Elimination System (NPDES) provisions of the CWA, Reclamation must obtain a pollutant discharge permit for the discharge of product water into the Colorado River. Under the CWA, the EPA is allowed to delegate this authority to the ADEQ. ADEQ administers the NPDES program as the AZPDES permit program. Under AZPDES, any facility that discharges pollutants into the waters of the U.S. is required to obtain an individual or general permit. Therefore, Reclamation will obtain a permit from ADEQ for discharge of product water into the Colorado River.

3.5.1.3 Groundwater

Groundwater serves as a vital component to the Colorado River system. It is formed when water from precipitation, irrigation, or stream/river seepage is absorbed into the ground and then collects in aquifers. Groundwater recharge typically comes from upstream aquifers and seepage from canals, streams, irrigation, and precipitation. Generally, the groundwater in the Yuma area consists of higher salt concentrations than that of the Colorado River. Typical groundwater TDS are in the range of 1,500 ppm

(expressed as TDS) to 1,800 ppm (expressed as TDS) (Reclamation 2008a). Above Morelos Dam, groundwater is pumped from the underlying alluvium.

According to the document “Balancing Water Needs on the Lower Colorado River: Recommendations of the Yuma Desalting Plant/Cienega de Santa Clara Workgroup” (2005), the Yuma area is one of the few areas in Arizona with an excess supply of groundwater due to the influence of the Colorado River, geological conditions and commercial agricultural practices. This has resulted in negative effects to crop production due to water-logging. Water-logging occurs when agricultural land is saturated by excessive irrigation or by a rising water table. In order to alleviate this problem, wells and channels were constructed to pump excess water into open channel drains.

Certain facilities discharge pollutants directly to an aquifer or to the land surface or vadose zone (the area between an aquifer and the land surface). Reclamation currently holds an Aquifer Protection Permit (APP) from ADEQ for such facilities. Reclamation operates the A-22 evaporation cells in accordance with these regulations, and complies with all applicable standards regarding the existing use of the A-22 ponds.

The WQIC currently produces small quantities of biosolids. Biosolids consisting primarily of water and calcium carbonate are a byproduct of YDP operations and could potentially affect the aquifer. Currently, these biosolids are transported via pipeline to the A-22 evaporative ponds, which are located approximately 20 miles southeast of the YDP (refer to Figure 3-1). The A-22 evaporative and disposal cells are lined with a polyvinyl chloride liner and are fenced to prevent intrusion by wildlife or trespassing by humans. The YDP and associated facilities are the only entities which dispose of biosolids in the A-22 evaporation cells.

3.5.2 Environmental Consequences

3.5.2.1 No Action Alternative

Under the No Action Alternative, Reclamation will not conduct a Pilot Run of the YDP. Process related effluent and emissions data will not be collected from a real-time operation of the YDP, no information regarding actual plant operation will be collected, suitability of treatment processes and associated facilities will not be verified, benchmark operating costs will not be determined, and there will be no discharge of product water to the Colorado River.

3.5.2.2 Proposed Action

Surface Water

Under the Proposed Action, the YDP will produce about 22,400 AF of product water during the Pilot Run. Approximately 700 AF of product water is retained for in-plant use, and does not reach the Colorado River. About 21,700 AF of the desalinated product water will be blended with about 7,300 AF of Bypass Drain flow from the MODE. The resulting approximate 29,000 AF of water will be discharged into the Colorado River, and used to fulfill Mexico’s 1944 Water Treaty allotment. Reclamation will continue to meet the provisions of Minute 242 during the Proposed Action.

The Proposed Action could result in reduced releases from Hoover Dam. Rather than water being released from Hoover Dam, treated water would be utilized from the YDP. Reduced releases could result in slightly lowered river elevation, decrease the amount of open water and decrease backwater areas in the lower Colorado River between Hoover and Imperial Dams. However, it is anticipated that these effects would be so small as to be immeasurable. Studies by Reclamation found that decreasing releases from Hoover Dam by 400,000 AF each year decreased average water surface elevation by only 0.4 feet (Reclamation 2000). The Proposed Action would potentially result in a much smaller effect by reducing releases by approximately 22,400 AF over a 12 to 18 month time period. This would reduce the Colorado River surface elevation by approximately 0.02 feet, or about one-quarter of an inch. Change in releases under the Proposed Action would not conflict with water delivery obligations, cause substantial groundwater depletion, or alter existing drainage.

In the 11 miles from the MODE 1 Diversion/Return Facility to the NIB, several farmers do withdraw water from the Colorado River for agricultural irrigation. These withdrawals are less than 20,000 AF annually. Use of the MODE 1 Diversion/Return Facility during the proposed Pilot Run will have no impact on these water users since the salinity levels of their delivered water will be well below any that could adversely impact agriculture.

Downstream of the YDP, Bypass Drain flows during the Proposed Action would be approximately 77,017 AF of water with an estimated salinity of 3,204 ppm (expressed as TDS). This volume and salinity are calculated as follows:

	Volume (AF)	Salinity (ppm)
Average MODE flow absent the Pilot Run	106,897	2,664
Feed water into the YDP	- 37,980	2,664
MODE water to the River	- 7,300	2,664
Concentrate from the YDP	+ 9,600	7,230
Pretreatment/filter backwash returned to MODE	+ <u>5,800</u>	<u>2,280</u>
TOTAL	<u>77,017</u>	<u>3,204</u>

In summary, as a result of the Pilot Run, the expected reduction in the Bypass Drain flow at the SIB is approximately 29,880 AF with an increase in salinity of about 540 ppm (expressed as TDS).

Water flowing into Mexico in the Bypass Drain is not counted against Mexico's 1944 Water Treaty allotment. Therefore, any change in the amount of flow will have no effect on the U.S. obligations under the 1944 Water Treaty and appropriate implementing protocols. Water delivery obligations consistent with the 1944 Water Treaty and appropriate implementing protocols will continue to be met.

Although not part of the Proposed Action, and as a result of voluntary bi-national consultations through the IBWC, the Joint Report indicates that the U.S., Mexico, and a

partnership of non-governmental organizations will each arrange for 10,000 AF of water to be diverted to the Bypass Drain. This will total 30,000 AF of flows diverted to the Bypass Drain as arranged per the Joint Report. Please see Appendix C for a copy of the Joint Report and other, associated documents.

Groundwater

The Proposed Action will produce approximately 190 AF of biosolids during the Pilot Run. These biosolids, if not disposed of properly, could affect groundwater in the Yuma area. However, the biosolids will be transported via pipeline to the existing A-22 disposal cells, and will remain there. These are lined, evaporative cells which prevent biosolid constituents from reaching the groundwater and adversely affecting aquifer. The YDP and associated facilities are the only entities which dispose of biosolids in the A-22 evaporation cells. Table 3-1 compares the current discharge to the cells with that anticipated during the proposed Pilot Run. As appropriate, Reclamation will voluntarily notify ADEQ of the proposed change of amount discharged to the A-22 cells for the Proposed Action.

Table 3-1 Comparison of Biosolids Discharge

Description	No Action (Ongoing WQIC Ops)	Proposed Action Pilot Run
Annual Production (in AF)	4.5	190
Solids (wt %)	20	20
Biosolids Composition		
<i>Calcium Carbonate</i>	95%	95 %
<i>Magnesium Oxide</i>	3%	3 %
<i>Silica</i>	2%	2%
<i>Ferric Oxide</i>	<1%	<1 %
<i>Silt</i>	<1%	<1 %
<i>Polymer</i>	<1%	<1%

Source: Reclamation

Water Quality

An individual NPDES/AZPDES permit will be required by ADEQ for the discharge of product water into the Colorado River. Reclamation is coordinating with ADEQ, and the appropriate permits will be in place prior to any discharge into a water body regulated under the CWA. The Proposed Action will fully comply with AZPDES requirements set forth by the ADEQ, and all appropriate actions will be taken pursuant to permit requirements.

In addition, water discharged to the Colorado River will be at TDS levels of approximately 790 ppm (expressed as TDS). This water will meet the salinity

requirements of Minute 242, and it will be used to fulfill a portion of Mexico's water allocation as outlined in the 1944 Water Treaty and appropriate implementing protocols.

Concentrate, a byproduct of the YDP's RO process, will be released to the MODE. RO is a pressure-driven process. When enough pressure is applied to a saline solution against a semi-permeable membrane, pure water molecules pass through the membrane. What is left behind on the other side of the membrane is a concentrated solution of the salts and other constituents which cannot pass through the membrane. Therefore, concentrate is as the term implies: a concentrated form of the feed water which entered the YDP.

Concentrate flow from the YDP, consisting of dissolved salts at approximately 7,230 ppm (expressed as TDS), will be discharged into the MODE. When mixed with flows in the MODE, the TDS will increase by about 540 ppm (expressed as TDS) to about 3,200 ppm (expressed as TDS). However, the Bypass Drain is not subject to the salinity requirements set forth in Minute 242, and is not subject to regulation under the CWA.

Concentrate may also contain some residual levels of the chemicals used by the YDP or the byproducts of chemical reactions which occur during the water treatment process. Chloramines, ammonia, anti-scalant, or trihalomethanes may be present at measurable levels in the concentrate. However, these may no longer be detectable by the time the Bypass Drain flow reaches the SIB because these substances quickly degrade. In addition, concentrate is diluted over 700 percent with raw flow water in the Bypass Drain and then this mixture is exposed to over 20 miles of open canal before reaching the SIB.

Outside the context of NEPA, pursuant to international consultations, a Joint Report has been issued, which indicates that the U.S., Mexico, and a partnership of non-governmental organizations will each arrange for 10,000 AF of water to be diverted to the Bypass Drain. This will total 30,000 AF of flows diverted to the Bypass Drain. These voluntary actions, undertaken purely in the interest of international comity, pursuant to IBWC consultations, will have the effect of providing flows as arranged per the Joint Report. Please see Appendix C for a copy of the Joint Report and other, associated documents.

3.5.3 Management and Mitigation Measures

ADEQ will promulgate all management and mitigation requirements necessary for the NPDES/AZPDES permit. Reclamation will comply with all requirements in the permit, and, as appropriate, follow industry-standard BMPs.

3.6 Hazardous Materials

The hazardous materials discussion primarily relates to the transportation, storage, use, and disposal of hazardous wastes that are regulated under RCRA, Subtitle C that would likely result from implementation of the Proposed Action.

Hazardous materials include, but are not limited to: hazardous substances, hazardous wastes, and any material that may be considered harmful to human health or the

environment. Hazardous materials can appear in the form of liquids, solids, contained gases, or biosolids.

3.6.1 Affected Environment

Reclamation will use a variety of general chemical materials during the proposed YDP Pilot Run, all which are presently utilized on-site. Some are classified as hazardous by federal or state law. A chemical is deemed hazardous if it is listed by a federal, state, or local regulatory agency, or if it has characteristics defined as hazardous by such agencies.

The YAO facilities, including the YDP, currently are classified and registered with the EPA as a small quantity generator (SQG) of chemical hazardous waste. According to the EPA, SQGs generate more than 100 kilograms and less than 1,000 kilograms of hazardous waste per month (EPA 2001). Requirements for SQGs include:

- possession of appropriate permits for accumulation of hazardous waste on-site for more than 181 days (or 271 days if shipping a distance greater than 200 miles);
- the quantity of hazardous on-site waste must never exceed 6,000 kilograms; and
- a minimum of one employee always available to respond to an emergency. This employee must be the emergency manager responsible for coordinating all emergency response measures. However, SQGs are not required to have detailed, written contingency plans.

General substances such as solvents, lubricants, fuels, motor oil, grease, and adhesives already are used in the general maintenance of the plant and also will be used during the Proposed Action. These substances are not listed as hazardous materials and are not considered to be hazardous by regulatory standards. However, wastes generated from these substances are stored and disposed of in accordance with appropriate federal and state regulations.

Hazardous wastes are not disposed of or treated on-site at the YDP. Instead, Reclamation contracts with an approved independent waste disposal firm to transport waste to off-site treatment, storage, and disposal facilities.

The essential purpose of Title III of the EPA *Superfund Amendments and Reauthorization Act* (SARA), is to assure that information regarding hazardous chemicals is made available to emergency response agencies and the general public. The *Emergency Planning and Community Right-to-Know Act* (EPCRA) is part of SARA Title III and contains four major provisions:

1. Planning for chemical emergencies
2. Emergency notification of chemical accidents and releases
3. Reporting of hazardous chemical inventories
4. Toxic chemical release reporting

Planning for chemical emergencies and emergency notification of chemical accidents and releases is handled through implementation of a PSMP and an RMP. Chlorine and ammonia are two substances which have the potential for emergency release, and which are utilized by the WQIC for day-to-day operations, as well as maintenance of the YDP. Because of the presence of these chemicals, the Occupational Safety and Health Administration (OSHA) mandates that a PSMP and an RMP be developed and utilized. An RMP/PSMP for the daily operations of the WQIC, as well as for YDP's 2007 Demonstration Run is on file. This document will be updated prior to commencement of the proposed Pilot Run. Table 3-2 provides a summary of regulations for these materials.

Table 3-2 Regulated Toxic Substances and Threshold Quantities

Chemical Name	Threshold Quantity (lbs)	Basis for Listing
Chlorine	2,500	Mandated for listing by Congress; On EHS list, vapor pressure 10mmHg or greater.
Ammonia (anhydrous)	10,000	Mandated for listing by Congress; On EHS list, vapor pressure 10mmHg or greater.

Source: Environmental Protection Agency

The RMP and PSMP work together. The RMP focuses on analysis of off-site consequences to the public and the environment from an accidental release, as well as planned emergency response. The PSMP focuses on proactively identifying hazards and ensuring operating and maintenance procedures reduce the risk of accidental releases. In other words, the RMP determines what can occur as a result of an accidental release and the PSMP focuses on preventing that from occurring. Both the RMP and PSMP ensure well-planned emergency response should a release occur.

The EPA established the requirements for RMPs in 40 CFR 68. Facilities that are subject to these requirements must register with the EPA and submit a facility specific RMP. OSHA regulations (29 CFR 1910.119) set forth the requirements associated with PSMPs.

For any hazardous chemical used or stored in the workplace, facilities must also maintain a material safety data sheet (MSDS), and submit the MSDSs (or a list of the chemicals) to their State Emergency Response Commission (SERC), Local Emergency Planning Committee (LEPC) and local fire department. Facilities must also report an annual inventory of these chemicals by March 1 of each year to their SERC, LEPC and local fire department. The information must be made available to the public.

Facilities covered by these requirements must submit an emergency and hazardous chemical inventory form to the LEPC, the SERC and the local fire department annually. Facilities provide either a Tier I or Tier II form. Most states, including Arizona, require the Tier II form. Tier II forms require basic facility identification information, employee contact information for both emergencies and non-emergencies, and information about chemicals stored or used at the facility, including:

1. The chemical name or the common name as indicated on the MSDS
2. An estimate of the maximum amount of the chemical present at any time during the preceding calendar year and the average daily amount
3. A brief description of the manner of storage of the chemical
4. The location of the chemical at the facility
5. An indication of whether the owner of the facility elects to withhold location information from disclosure to the public

Using data supplied by the YDP Operations and Maintenance Contractor, the YAO Environmental Compliance Team submits the Tier II information electronically using the Arizona State Emergency Response Commission (AZSERC) website (www.azserc.org).

EPCRA Section 313 requires EPA and the States to annually collect data on releases and transfers of certain toxic chemicals from industrial facilities, and make the data available to the public in the Toxics Release Inventory (TRI). In 1990, Congress passed the *Pollution Prevention Act* which required that additional data on waste management and source reduction activities be reported under TRI. The goal of TRI is to empower citizens, through information, to hold companies and local governments accountable in terms of how toxic chemicals are managed.

EPA compiles the TRI data each year and makes it available through several data access tools, including the TRI Explorer and Envirofacts. There are other organizations which also make the data available to the public through their own data access tools, including Unison Institute which puts out a tool called "RTKNet" and Environmental Defense which has developed a tool called "Scorecard."

Armed with TRI data, communities have more power to hold companies accountable and make informed decisions about how toxic chemicals are to be managed. The data often spurs companies to focus on their chemical management practices since they are being measured and made public. In addition, the data serves as a rough indicator of environmental progress over time.

3.6.2 Environmental Consequences

3.6.2.1 No Action Alternative

Under the No Action Alternative, there would be no change in the amount of listed hazardous substances transported, stored, or used at the YDP. An RMP and a PSMP are currently utilized for existing quantities and uses of these chemicals. YAO employees will continue to submit data for Tier II and TRI compliance electronically. The No Action Alternative will not result in a change to existing compliance for hazardous materials, nor increase the potential for adverse effects in the event of a release.

3.6.2.2 Proposed Action

A variety of substances will be used during the proposed YDP Pilot Run that may be considered hazardous. The procedures for the disposal of these materials include separating incompatible materials, placing them in appropriate sealed containers, and

identifying all components with approximate concentrations. The YDP will remain a SQG and will continue to meet all reporting requirements.

YAO employees will continue to submit data for Tier II and TRI compliance electronically using the AZSERC website, and the Toxic Release Inventory Made Easy software (TRI-ME), which may be viewed at www.epa.gov/tri.

Two specific, potentially hazardous chemicals will be stored and used at YAO during the Pilot Run in sufficient quantities that they warrant particular focus. They are liquid chlorine and anhydrous ammonia. Reclamation takes its safety obligations associated with the storage and use of all chemicals very seriously, but pays particular attention to those which are designated as hazardous. Safety measures utilized by YAO focus on the prevention of accidents to ensure the well-being of the personnel on site as well as those in the surrounding community.

During the proposed Pilot Run, the YDP is projected to utilize between 391 and 521 tons of liquid chlorine and between 51 and 127 tons of anhydrous ammonia. Due to an increase in the amounts of these chemicals necessary for the Proposed Action (above the 2,500-lb threshold for liquid chlorine, and above the 10,000-lb threshold for anhydrous ammonia), YAO's existing RMP/PSMP will be revised in order to ensure these chemicals are stored and used in a manner that prevents accidental release. Reclamation always retains responsibility for the safe use and storage of hazardous materials. The RMP/PSMP must continue to accurately reflect how personnel actually perform their work and how personnel would respond in the event of an accidental release. Since no combination of training, procedures, technology, and human care is infallible, safety measures also include emergency response to minimize potential impacts should an accidental release occur.

The existing RMP/PSMP are comprehensive documents which address potential impacts of an accidental release with chemical quantities which are currently on site. Should the Proposed Action be selected, they will be revised in accordance with EPA and OSHA requirements to continue to ensure employee, public, and environmental safety due to the greater amounts of chemicals necessitated by the YDP Pilot Run. Before the Proposed Action is begun, the revision process will be completed, however, a complete revision of the RMP/PSMP documents requires a substantial investment of assets which would be inappropriate before the NEPA review process is completed. The RMP/PSMP revision will rely heavily on Reclamation and contract personnel with extensive hands-on YDP knowledge and experience. Those personnel also typically have five to ten years experience operating and maintaining the WQIC, the 1/100th scale version of the YDP that has operated on-site since 1987. Reclamation would also utilize a contract firm experienced in both risk and process safety management in industrial settings; this same firm assisted Reclamation in developing the existing RMP/PSMP.

The revision process begins with a gap analysis. This will identify any changes necessary in the existing RMP/PSMP as a result of the Proposed Action. Those changes will then be included in a new RMP/PSMP. For example, the existing RMP covers use of chlorine delivered in one ton containers and 90 ton rail cars, but will be revised to include the use

of chlorine delivered by 17 ton trucks. In addition, the gap analysis will revisit on-site and off-site conditions, procedures, training, drills, and record-keeping, identifying and analyzing any changes which must be made should the Proposed Action occur. A gap analysis that covers all these aspects ensures thorough identification of any necessary revisions to the RMP/PSMP to accommodate the proposed Pilot Run.

The following is a summary level outline of YAO's RMP/PSMP. All dimensions will be reviewed and wherever necessary, revised prior to commencing the Proposed Action.

Risk Management Program

Hazard Assessment and Off-site Consequence Analysis

- Description of worst-case scenario chemical release
- Description of alternative release scenarios of chemical release
- Modeling of worst-case and alternative scenarios of chemical releases
- Determination of off-site consequences

Emergency Response Plan Requirements

- Response and mitigation of chemical release
- Notifications to be performed
- Coordination of emergency responders
- Written emergency plans
- Emergency preparedness drills

Process Safety Management Program

Process Hazards Analysis

- What-If/checklist analysis
- Failure modes and effects analysis
- Hazard and operability analysis
- Consideration of off-site impacts

Standard Operating Procedures

- Chemical properties and hazard physiology
- Hazard communication standards
- Exposure limits
- Reducing exposure and protection
- Receiving procedure
- Returning procedure
- Prestart up requirements
- Start up and shutdown
- Normal operations
- Leak detection and emergency response
- Emergency shut down
- Start up after emergency shutdown
- Lay up

Management of Change

- Interface of PSMP with changes in Operations & Maintenance procedures
- Management of Change program

Procedure Modification

- Modification of procedures based on the Proposed Action
- New procedures based on the Proposed Action
- Design and documentation/certification rules and process
- Design and document control and change control

Incident Investigation

- Incident investigation requirements
- Evidence analysis and root cause determination
- Recommendations and follow-through
- Documentation and regulatory requirements

3.6.3 Management and Mitigation Measures

The BMPs currently used by YDP personnel, and those under development to prevent, respond to, and control the release of hazardous materials can be found in the current version of the RMP/PSMP. Reclamation developed these documents in accordance with provisions of the CAA (40 CFR 68.130 Subpart G) for chlorine and anhydrous ammonia stored on-site and used by the WQIC. Since quantities of hazardous materials utilized on-site during the Proposed Action will increase, an updated version of the RMP/PSMP will be implemented, as discussed in Section 3.6.2.2.

In addition, Reclamation contracts with licensed hazardous wastes transporters to ensure that all hazardous waste generated by any of its facilities (including waste that will be generated from the Proposed Action) is transported to a licensed, off-site hazardous waste facility for treatment or disposal. Hazardous materials are routinely transported by truck. The U.S. Department of Transportation, Office of Hazardous Materials Safety, prescribes strict regulations for the safe transport of hazardous materials, as outlined in CFR Title 49. The transport of hazardous materials also is in accordance with state regulations and will be monitored as appropriate.

3.7 Indian Trust Assets

Indian Trust Assets (ITAs) are legal interests in property held in trust by the U.S. for Indian tribes or individuals, or property that the U.S. is charged by law to protect for Indian tribes or individuals. In accordance with the *Indian Trusts Fund Management Reform Act of 1994*, as amended, all Department of Interior agencies, including Reclamation, are responsible for protecting ITAs from adverse effects resulting from their programs and activities. In cooperation with tribes, federal agencies must inventory and evaluate assets and mitigate or compensate for adverse effects to the asset. While most ITAs are located on reservation lands, they also may be located off-reservation. Examples of ITAs include, but are not limited to: land; minerals; rights to hunt, fish, and gather; and water rights. Though the YDP is located near a reservation, no ITAs were identified in the project area.

3.7.1 Affected Environment

The YDP facility is located immediately adjacent to the North Cocopah Indian Reservation and across the Colorado River from portions of the Fort Yuma-Quechan Indian Reservation. Figure 3-2 shows the location of these reservations in relation to the YDP facilities.



Figure 3-2 Location of North Cocopah and Fort Yuma-Quechan Indian Reservations in Relation to YDP

3.7.1.1 Lands

The Proposed Action is not located on lands which are ITAs; however, it is located adjacent to the North Cocopah Reservation. While the entire Cocopah Reservation encompasses approximately 6,500 acres, the North Reservation is comprised of 640 acres

(ADC 2008a). There are a small number of tribal residences on the North Reservation and one commercial enterprise, the Cocopah RV and Golf Resort. Quechan lands located across the Colorado River are mostly undeveloped and vacant. No Quechan tribal residences are located on this land; however, there is a tribal parking lot immediately adjacent to the Los Algodones port-of-entry less than one mile from the YDP, and a newly constructed hotel and casino. These enterprises are a significant source of revenue for the Quechan Tribe, especially during the winter tourism season, when up to 15,000 people a day may cross the border or visit the casino for shopping, lodging, and entertainment.

3.7.1.2 Water Rights

Currently, the Cocopah Indian Tribe possesses perfected Federal Reserved rights to 10,847 AF per year of Colorado River water. This tribal water is diverted from the Colorado River at Imperial Dam and delivered via the Yuma Main Canal and various irrigation structures (Department of Interior 2004). In addition, the tribe has numerous well permits that allow the tribe to pump groundwater from aquifers that may be connected to the Colorado River within the boundaries of the U.S. (Department of Interior 2004).

3.7.1.3 Hunting, Fishing, and Gathering Rights

The Colorado River and its tributaries provide habitat for sensitive fish and wildlife species, especially in the riparian woodlands and marshes. Much of this habitat is located within the Cocopah Indian Reservation and is managed by the Cocopah Environmental Protection Office. Some members of the tribe collect a variety of plants, which are eaten as well as used for medicinal and ceremonial purposes, and in traditional craft production (Department of Interior 2004).

3.7.2 Environmental Consequences

In accordance with the *Indian Trusts Fund Management Reform Act of 1994*, as amended, all Department of Interior agencies, including Reclamation, are responsible for protecting ITAs from adverse effects resulting from their programs and activities. Reclamation departmental policy requires the agency to address any effects to ITAs.

3.7.2.1 No Action Alternative

Under the No Action Alternative, the proposed YDP Pilot Run will not take place. Therefore, no change to federal actions will occur that could result in an adverse effect to identified ITAs.

3.7.2.2 Proposed Action

Lands

The Proposed Action will not interfere with any lands which are ITAs. The YDP is not located on ITAs and does not affect the use or management of any tribal lands.

Water Rights

The Proposed Action will not affect with the Cocopah Tribe's reserved water rights. The Proposed Action will not result in a change to any tribal water right, nor to the diversion or delivery of tribal water entitlements.

Currently, the Cocopah Indian Reservation performs its own water treatment operations. Tribal members receive their water from wells located within the reservation and convert the raw water from the wells into potable water. For a more detailed discussion on the potential effects to water quality from the Proposed Action, refer to Section 3.5 Water Resources. Because the Cocopah Indians receive their water from wells located on the reservation, the operation of the YDP will not affect water quality where there is a reserved water right. Therefore, no impact would occur.

Hunting, Fishing, and Gathering Rights

The proposed YDP Pilot Run will not affect any hunting, fishing or gathering rights which could be exercised by any Tribe.

3.7.3 Management and Mitigation Measures

No ITAs will be affected by the Proposed Action, therefore no management or mitigation measures will be necessary. Reclamation will coordinate with both Tribes on an as-necessary basis to ensure that ITAs remain unaffected.

3.8 Environmental Justice

Executive Order 12898 requires federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the U.S.

Minority populations include all persons identified by the Census of Population and Housing to be of Hispanic or Latino origin, as well as, non-Hispanic persons who are African American, American Indian and Alaska Native, or Native Hawaiian or other Pacific Islander.

Low-income populations are those that fall within the annual statistical poverty thresholds from the Bureau of the Census' Current Population Reports, Series P-60 on Income and Poverty. If the total income of a person's family is less than the threshold appropriate for that family, then the person is considered poor, together with every member with his or her family. The definition of poverty is dependent on the size of the family. For example, the 2006 poverty threshold for a family of three is \$16,079; whereas, the threshold for a family of four is \$20,615 (CBPP 2006).

3.8.1 Affected Environment

The analysis area for assessing adverse effects to a minority population and low-income populations are the city of Yuma, the Cocopah and Fort Yuma-Quechan Indian reservations, and rural populations adjacent to the YDP facility (see Table 3-3).

The U.S. Census Bureau estimates the 2006 population of the city of Yuma was 92,160. The population of Yuma consists primarily of Caucasians (White) and peoples of Hispanic or Latino descent. According to the Census Bureau, in the year 2000, approximately 68.3 percent of the population in Yuma was Caucasian and approximately 45.7 percent were persons of Hispanic or Latino origin. Only 5.1 percent of the population was of another race, such as African American, Asian, or Native Hawaiian or other Pacific Islander. Native Americans accounted for 1.5 percent of the population. The median household income in 1999 was \$35,374; however, 14.7 percent of the population was considered to be below the poverty level. Table 3-3 summarizes the total and minority population data for the city of Yuma, the Cocopah Indian Reservation, and the Fort Yuma-Quechan Indian Reservation, including persons living below the poverty level.

Table 3-3 Total and Minority Population Data for the Analysis Area (2000 data)

Analysis Area	Total Population (2007)	Total Population (2000)	Minority Population (2000)	Percent Minority (2000)	Below Poverty Level (1999)
City of Yuma	93,212 ¹	77,515 ¹	39,222 ¹	51 ¹	14.7 % ¹
Cocopah Indian Res.	-- ²	1,025	1,025	NA	-- ²
Fort Yuma-Quechan	-- ²	2,761	2,761	NA	-- ²
1. Not Including Native Americans 2. Not available. NA = Not applicable. Source: U.S. Census Bureau and the Arizona Department of Commerce.					

The community profile and population data for the Cocopah Indian Reservation were obtained from the Arizona Department of Commerce. Between the years 1990 and 2000, the population for the entire Cocopah Indian Reservation grew by approximately 49 percent. The current total population of the reservation is unknown; however, the population in 2000 was estimated at 1,025. Because American Indians are considered a minority group, the minority population of the reservations and the total population for the reservation are the same. The percent of Cocopah Indians living below the poverty level currently is unknown.

Historically, agriculture has been the primary source of the tribal economy and provides an annual income of about \$250,000 for the Cocopah Tribe (ADC 2008). Other primary sources of income for the Tribe are construction, manufacturing, mining, retail trade, services, forestry and fishing, casinos, and recreational activities (ADC 2008). In 2007, the Arizona Department of Economic Security estimated that about 246 Cocopah Tribal members were contributing to the civilian labor force. This equates to an unemployment rate of roughly 18.3 percent for the Cocopah Tribe. The unemployment rate has decreased from 37.5 percent in 1990.

Information provided below for the Quechan Indian Reservation was obtained from the *Census 2000 American Indian and Alaska Native Summary File*. The Quechan Tribe is located along both sides of the Colorado River near Yuma, Arizona, and borders the states of Arizona, California, and Baja California in Mexico. The reservation encompasses approximately 45,000 acres of which 700 acres of farmland are leased to non-Indian farmers. 2000 Census data estimates the population for the Quechan Tribe at 2,761.

The reservation is largely an agricultural community. However, a large amount of the Tribe's economy depends on tourism and related business. The Tribe operates a commercial parking lot in Andrade, California, which is located outside the port-of-entry to Los Algodones, Mexico, as well as a newly constructed hotel and casino. These enterprises receive a vast amount of tourist traffic during the winter tourism season (ITCoA 2003). In 2000, it was estimated that roughly 979 Quechan tribal members contributed to the civilian labor force. This equates to an unemployment rate of 11.4 percent. The median household income reported in 1999 was \$30,867. The Census Bureau does not have current information for Tribal members living below the poverty level.

3.8.2 Environmental Consequences

3.8.2.1 No Action Alternative

Under the No Action Alternative, the YDP Pilot Run will not take place. Therefore, no federal actions will occur that could result in a disproportionately high and adverse effect on the health or environment of minority or low-income populations.

3.8.2.2 Proposed Action

Based on previous analysis for air quality in the Air Quality section of this EA, changes in air quality resulting from the Proposed Action will not result in proportionately high and adverse effects to the environment or to the health of low-income and minority populations. For a more detailed discussion on air quality in the greater Yuma area, refer to Section 3.3 of this EA.

Based on the previous analysis for water quality in the Water Resource section of this EA, there will a salinity increase of 30 ppm (expressed as TDS) in Colorado River water below the confluence of the Gila and Colorado Rivers, due to the Proposed Action. However, this will not result in proportionately high and adverse effects to the environment or to the health of low-income and minority populations. For a more

detailed discussion on the quality of water of the Colorado River, refer to Section 3.5 of this EA.

Based on the previous analysis for hazardous materials in the Hazardous Materials section of this EA, hazardous materials used in the Proposed Action will not result in proportionately high and adverse effects to the environment or to the health of low-income and minority populations. For a more detailed discussion of hazardous materials, refer to Section 3.6 of this EA.

3.8.3 Management and Mitigation Measures

No low-income or minority populations will be adversely affected by the Proposed Action, therefore no management or mitigation measures will be necessary.

3.9 Noise

3.9.1 Affected Environment

Noise is a source of pollution, and can be a public health hazard. Its effects can include various physical and psychological impacts on humans and wildlife. Residential areas, schools, libraries, hospitals, assisted living facilities, wilderness, and recreational areas are all noise sensitive. Noise Zones are delineated on the *Yuma County Noise Exposure & Compatibility Overlay* (Yuma County 2005).

The area surrounding the YDP is a rural setting. Sound levels vary within the area but are generally acceptable. As noted in Figure 3-2, small populations are located approximately one mile from the YDP, however, no sensitive receptors such as hospitals, schools or parks are in the project area. Land is predominately used for agricultural purposes, with large, diesel-powered farming equipment routinely operated. Because of the use of farming equipment, pumps, vehicle usage and the like, the YDP lies in a 65-decibel (dB) to 80 dB noise corridor.

The Yucca Power Plant is situated directly adjacent to the YDP. This facility is a contributor to ambient noise levels in the surrounding area, due to its use of five combustion turbines and one steam generator. Because of the use of combustion turbines, the noise level of the Yucca Power Plant is greater than the noise generated from the YDP facility.

Other potential noise generators in the area include the operation of Morelos Dam, the town of Los Algodones, Mexico, Interstate 8, recreational activities along the Colorado River and frequent vehicular traffic along the levee (i.e. U.S. Border Patrol and agricultural equipment). The Border Patrol and the Marine Corps Air Station frequently use helicopters and other military aircraft in the immediate vicinity of the YDP, which also contribute heavily to the ambient noise level in the area when they are in operation.

3.9.2 Environmental Consequences

3.9.2.1 No Action Alternative

Under the No Action Alternative, the proposed YDP Pilot Run will not take place. Therefore, no federal actions will occur that could result in an adverse effect to noise levels in the surrounding area.

3.9.2.2 Proposed Action

Operation of the YDP will result in a slight increase in the ambient noise immediately surrounding the facility. However, noise levels generated by the YDP are less than currently existing noise contributors in the area and will not exceed noise standards, see Table 3-4.

Table 3-4 Sound Level Measurements

A – Weighted Sound Level Measurements in Decibels			
Location	Distance from YDP's Pump Motors	Maximum	Minimum
Current conditions at YDP facility (non operational) – Reading taken along the North Levee Road (north side of YDP is the closest distance to populated areas)	1000 feet	69.0	65.0
With pump motors operating at YDP facility – Reading taken inside facility adjacent to the motors (area restricted to public)	10 feet	82.1	74.2
With Pump Motors operating at YDP facility – Reading taken along the North Levee Road (closest distance to populated area)	1000 feet	70.4	68.3

Also, an increase in traffic is expected along the paved roads near the YDP as a result of additional employees and delivery trucks to the YDP. Noise levels along the roads are not expected to increase from current traffic noise levels of 75 dB to 80.0 dB during the early morning and the late afternoon commute. Sensitive noise receptors are sufficiently distant from the YDP to not have any effect. Conversations with area residents indicated that noise levels were not detectable during the YDP demonstration run (personal communication, Wayne Johnson, 2009). The Proposed Action will not result in construction activities or excessive noise generation due to operation of construction equipment. The YDP will operate within acceptable ambient noise levels in accordance with applicable noise ordinances or standards, and will not result in significant negative effects due to noise.

3.9.3 Management and Mitigation Measures

Though the noise levels from the Proposed Action would not be significant, due to the use of electrical power motors, barriers such as high partition walls have been constructed to further minimize noise levels. In addition, other factors contributing to the minimization of noise levels near the YDP are the existing lower speed limit

requirements along the paved levee road, Calle Agua Salada, and County 8th Street for vehicular traffic.

3.10 Climate Change

3.10.1 Affected Environment

The potential impacts of climate change and hydrologic variability on the Colorado River have been subjects for discussion for many years. The continuing drought in the Colorado River Basin (CRB), coupled with recent advances in scientific knowledge regarding the potential impacts of climate change has heightened this interest. Reclamation acknowledges its responsibility to consider and analyze potential climate change impacts associated with the Proposed Action and very seriously considers all activities involving the possibility of hydrologic variability.

Reclamation's Lower Colorado Region initiated a multi-faceted research and development program in 2004 to enable the use of other methods for projecting possible future inflow sequences for Colorado River planning studies. A group of experts in meteorology, climate and hydrology, referred to as the Climate Technical Work Group (Work Group), was empanelled to provide information to Reclamation about the state of knowledge regarding climate science and future climate conditions and their impact on water resources, particularly on the CRB.

Reclamation published the Work Group's final report as an appendix to the final EIS for the proposed adoption of Interim Guidelines in October 2007. Three significant findings of the Work Group were:

- There is strong scientific consensus that the earth has been warming, that this warming is driven substantially by human emissions of greenhouse gases, and that warming will continue. Climate models project that temperatures will increase globally by 1 to 2°C in the next 20-60 years. The projections are fairly consistent for the next 20 years, with a 1°C increase, but exhibit larger uncertainty in the 40-year projections. Scientists agree on some of the important broad-scale features of the expected hydrologic changes, the most likely of which will be an increase in global average precipitation and evaporation as a direct consequence of warmer temperatures.
- The impact of climate change on the region of the CRB is less certain; however, it is expected that regional temperatures will also increase. Regional precipitation response is less certain with comparable evidence suggesting wetter or drier conditions. There is some consistency to indications of a general drying for mid-latitude regions such as the CRB, but this indication must be tempered by the limited precision of existing atmospheric models in resolving the topography of the southwestern U.S. The potential impacts of climate change on the CRB's water resources have been a subject of research for several decades. Although an aggregate message from these studies may be that a decrease in runoff can be

expected, runoff response across these same studies ranges from increase to decrease. These studies show that system storage is very sensitive to changes in mean inflows as well as to sequences of dry and wet years. The degree to which current methods can provide reliable information about future stream flow variability remains a question.

- There is an increasing awareness that in addition to gradual changes (long-term trends) in climate conditions, there is also a large degree of inter-annual and inter-decadal variability in climate, which may dominate the climate experienced in a basin in the short term (10-20 years in the future). The well known El Niño-Southern Oscillation has linkages in the Lower Basin where El Niño events bring generally wetter conditions and La Niña events bring drier conditions. A limitation on research relating inter-annual and inter-decadal variability is the relatively short time periods available for the analysis. The impacts from inter-annual and inter-decadal climate variability on stream flow may be significant for planning studies with short planning horizons (e.g., 20 years). This could be just as important as evaluating the impacts of climate change that may not be manifested in the basin for 20-50 years.

3.10.2 Environmental Consequences

3.10.2.1 No Action Alternative

Under the No Action Alternative, the YDP would not operate at one-third capacity. Therefore, the No Action Alternative would not have the potential to affect, or be affected by, climate change.

3.10.2.2 Proposed Action

With regard to the proposed Pilot Run of the YDP, it is apparent that the inter-annual and inter-decadal variabilities make it difficult to interpret climatological effects. The scope of this action is short-term (365 operating days within a 12 to 18 month period), as well as geographically limited, so it cannot be inferred that the Proposed Action will be affected by global climate change in any appreciable way. Climate change that is occurring and any effects (e.g. changes in Colorado River water supplies due to warming within the basin) would have no effect on Reclamation's ability to carry out the project because the source water for the Proposed Action does not require additional releases from the Colorado River system.

Conversely, two potential connections of the project to global climate change which have been raised throughout the public comment process are emissions from increased vehicle traffic and emissions from the production of electrical energy to be used during the Pilot Run. Potential effects of YDP operations, increased vehicular traffic associated with deliveries and increased workforce were analyzed. The results of that analysis are reported in Section 3.3 (Air Quality) of this EA, and indicate that hydrocarbon emissions attributable to the Proposed Action would fall well below the de minimis standard of 100 tons per year. The electricity to be used during the Proposed Action will be purchased from the supply of spot market power, and no additional generation will be required to

meet the YDP energy demands for the Proposed Action. Further, any environmental considerations, prudent or required, related to the demand for electricity would occur at the point of generation, not at the point of consumption. For example, the Western Area Power Administration, who would supply the electricity for the Proposed Action, has an extensive renewable resources program and operates in compliance with the *Energy Policy Act of 2005*. Finally, the data collected during the Proposed Action will indicate whether energy savings, and therefore operational cost savings, are realized as a result of improvements to YDP equipment and processes.

Reclamation recognizes the existence and importance of climate change. However, the results of this analysis indicate that climate change would not prevent the successful implementation of the Proposed Action and that there would be no significant contribution of hydrocarbons to the environment. Therefore, no effect on climate change is anticipated.

3.11 Cumulative Effects of the Proposed Action

Cumulative effects are the effects on the environment that result from the incremental effects of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such actions. Cumulative effects can result from “individually minor but collectively significant actions taking place over a period of time” (40 CFR 1508.7). Several current and planned projects either located within or in the vicinity of the planning area and having the potential to affect common resources will be addressed in this section.

3.11.1 Projects in the Area

Drop 2 Storage Reservoir Project

The Drop 2 Storage Reservoir Project, located in southern Imperial Valley, California, approximately 20 miles west of Yuma, Arizona, has three primary physical components: the reservoir itself, an inlet canal (approximately seven miles in length, 150 feet wide with capacity flow of 1,800 cubic feet per second), and an outlet canal (approximately 2,000 feet in length). The new inlet canal would convey water from the All-American Canal to the new storage reservoir, and later, water would be returned to the All-American Canal at a point approximately one mile downstream of Drop 2, via a new outlet canal. Both the inlet and outlet canals would be designed to use gravity flow. To maintain capacity, periodically silt would have to be removed from the bottom of the reservoir. Construction of the Drop 2 Storage Reservoir Project commenced in October 2008. The project is located approximately 15 miles west of the YDP. Potential effects relate to biological resources, hazardous materials, air quality, aesthetics, and cultural resources. With implementation of compensation measures, no significant effects are expected.

Laguna Reservoir Restoration Project

The proposed Laguna Reservoir Restoration Project would increase the amount of storage capacity in the basin area from 400 AF to 1,500 AF. The project area is located

immediately upstream of Laguna Dam through the excavation of accumulated sediments. Laguna Dam is located approximately 12 miles northeast of Yuma, Arizona, and five miles downstream from Imperial Dam. The project is intended to provide sufficient storage space at Laguna Reservoir to allow for the release of sluicing flows from Imperial Dam that would remove sediment accumulated at the AAC headworks and the California Sluiceway channel. An EA and FONSI for the Laguna Reservoir Restoration Project were finalized in December 2006. The Laguna Reservoir Restoration Project would have the potential to affect air quality in Imperial County, California, and biological resources of the Colorado River. With implementation of Imperial County Air Pollution Control District requirements for dust control, dredging and maintenance activities of the Laguna Reservoir Restoration Project would have no significant air quality effects. Dredging and maintenance activities as part of the project could result in a loss of nesting and foraging habitat for common and sensitive wildlife species. The Laguna Reservoir Restoration Project is a covered activity under the LCR MSCP and accompanying ESA Biological and Conference Opinion for Federal covered actions. With incorporation of avoidance and minimization measures of the LCR MSCP into the proposed project description, and compensatory mitigation for all marsh wetland habitats affected, no significant effects are expected.

Hunters Hole Restoration Project

Reclamation and the Bureau of Land Management (BLM) are currently working with the Yuma Crossing National Heritage Area in the development of a restoration project at Hunters Hole. A concept plan was developed which would accommodate habitat restoration along with border security features. Project components include the reestablishment of open water areas, and restoration of riparian and marsh habitats within the Hunters Hole Backwater area. The project area is located in the Limitrophe Division of the LCR, approximately 20 miles downstream of Morelos Dam. An EA and FONSI for the Hunters Hole Restoration Project were finalized in June 2009.

Multi-Species Conservation Program

The LCR MSCP is a multi-stakeholder, federal and non-federal partnership that seeks to balance the use of Colorado River water resources with the conservation of native species and their habitats in compliance with the ESA. As discussed in the MSCP HCP, Volume II, the overall goals of the MSCP are to develop and implement a plan that will:

- conserve habitat and work toward the recovery of threatened and endangered species, as well as reduce the likelihood of additional species being listed;
- accommodate present water diversions and power production and optimize opportunities for future water and power development, to the extent consistent with the law; and
- provide the basis for incidental take authorizations.

The LCR MSCP covers areas up to and including the full-pool elevations of Lakes Mead, Mohave and Havasu and the historical floodplain of the Colorado River from Lake Mead to the SIB. Reclamation's "covered actions" (actions for which ESA consultation, permitting and incidental take authorization was covered under the LCR MSCP) include

(but are not limited to): Reclamation's daily operations of Hoover, Davis, Parker, Senator Wash, Imperial, and Laguna Dams; flood control releases on the LCR; water deliveries to Arizona, California, Nevada, and Mexico consistent with existing contracts and obligations; electric power generation at Hoover, Davis, and Parker Dams; channel maintenance from Davis Dam to the SIB; operation and maintenance of major Federal facilities, and the Laguna Reservoir Restoration Project (see above). The LCR MSCP ESA covered activities also include the potential changes in points of diversion of up to 1.574 million AF per year of Colorado River water by water contractors in Arizona, California, and Nevada (LCR MSCP Biological Assessment, Vol. III). The Biological Assessment, Volume III and the Biological Opinion (prepared by the USFWS) addressed the effects of USFWS issuing the ESA take authorization and implementation of the plan's habitat conservation measures by the LCR MSCP over an anticipated 50 year period. Specific transfers for the entire 1.574 million AF per year have not been identified; the analysis looked at full effects of that amount of water being transferred, but specified that this total amount of water transferred could come from a number of different administrative actions. Diversion changes are expected to occur in response to shifts in water demand during the 50-year term of the LCR MSCP Conservation Plan. It is anticipated that a shift in water diversion from the southern reaches of the Colorado River upstream to Lake Mead and to Lake Havasu will occur. Potential effects could include changes in water surface elevation along the LCR where points of diversion are changed, as well as associated effects on biological resources.

BLM Hazardous Fuels Program

The BLM currently manages fire and hazardous fuels within the Limitrophe Division. These projects help to reduce the likelihood of catastrophic fires and secure the facilities and property within this reach. A number of projects including fire breaks, herbicide upkeep and fuels reduction areas have been implemented within the Limitrophe, Yuma, and Laguna Divisions of the LCR (SIB to Imperial Dam).

Border Patrol Fence Project

Border Patrol constructed a pedestrian border fence between SIB and County Road 18 (near Gadsden Bend), and a vehicle barrier fence upstream to Morelos Dam. Due to the waiver signed April 1, 2008, by Department of Homeland Security Secretary, Michael Chertoff, no environmental compliance was performed for this action. Therefore, environmental impacts were not evaluated, and mitigation and management plans were not promulgated and cannot be assessed.

Border Patrol Vegetation Treatment in the Limitrophe for Safety and Law Enforcement.

BLM issued a right-of-way license to Border Patrol that allows them to conduct vegetation treatment activities, maintenance, and mitigation in order to facilitate border security (enforcement) along the Limitrophe Division. This Proposed Action provides for the treatment of various vegetation types in the area, while avoiding and minimizing effects to native riparian and marsh vegetation.

Yuma Wetlands Restoration

The City of Yuma and the Yuma Crossing National Heritage Area have implemented two riparian and wetland restoration project that have also incorporated a recreational aspect along the LCR's Yuma Division (Yuma East and West Wetland projects). These projects have transformed former salt cedar thickets and degraded wetlands into functioning wetland areas and riparian forest areas while providing public access points. Projects are located approximately four miles upstream of the YDP.

Although the restoration projects are still under construction, initial findings suggest that the water diversions, vegetation treatments and invasive plant control have benefited many species of native wildlife. The Yuma East Wetlands provides regional benefits, providing alternative stop over habitat for migratory birds. Beneficial effects are likely at the Yuma East and West Wetlands due to the increase of 7,300 AF of MODE water introduced to the Colorado River via the MODE 1 Diversion/Return Facility.

3.11.2 Effects by Resource

Air Quality

Emissions from the Proposed Action would not contribute to an exceedance of an ambient air quality standard. As a result, the Proposed Action, in combination with other foreseeable sources and projects mitigation requirements, would not produce significant cumulative air quality effects.

Biological Resources

Running the YDP for a short duration in combination with other projects would not result in loss of habitat and effects on biological resources in the area of the Proposed Action.

Water Resources

The Proposed Action would not impact the U.S.'s ability to meet its obligation to deliver Mexico's share of Colorado River water under the 1944 Water Treaty and appropriate implementing protocols. The Proposed Action will operate for a short duration and in a manner that will not conflict with delivery obligations, and/or violate any applicable surface and groundwater water quality standards.

Hazardous Materials

Compliance with applicable federal, state, and local regulations would reduce the likelihood of potentially significant effects related to the use of chlorine and ammonia in the pretreatment process during operation of the YDP. Similarly, implementation of management and mitigation measures would reduce the Proposed Action's contribution to cumulative effects, resulting from the operation of the YDP, so that no significant effects would occur. In addition, other regional projects would also be subject to environmental review and appropriate mitigations established for each project, prior to construction. Therefore, significant cumulative hazards and hazardous materials effects are not projected to occur.

Indian Trust Assets

No effects to ITAs were identified for the Proposed Action. Therefore, no cumulative effects to ITAs are anticipated.

Environmental Justice

The Proposed Action, in combination with other proposed or on-going projects, are not anticipated to cause disproportionate cumulative effects on minority or low-income populations.

Noise

The Proposed Action, in combination with other proposed or on-going projects, are not anticipated to cause cumulative effects for noise levels in this area.

Climate Change

Running the YDP for a short duration in combination with other projects are not anticipated to result in global climatological changes.

3.12 Effects of Connected Actions

3.12.1 ICS Proposal

The creation of ICS credits from the Proposed Action would not result in any additional environmental impacts beyond those described in this EA for the Proposed Action. The storage and later recovery of ICS credits of up to 2.1 million AF was described in the 2007 Interim Guidelines. The potential specific ICS proposal associated with the Proposed Action, for a one-time ICS credit of 30,000 AF to the three municipal utilities, is consistent with, and falls within the analysis in the EIS in terms of reservoir storage, river operations, and water deliveries. Use of the conserved water by the three municipal utilities would simply add to their existing Colorado River supplies, allowing additional flexibility in meeting future demand, but would not result in new water uses, or construction of new water delivery facilities.

3.12.2 Joint Report

Reclamation's proposed conveyance of 10,000 AF of non-storable Colorado River flows into the Bypass Drain during the Pilot Run would not require construction of any new facilities. The non-storable flows, which arrive in Mexico at various times each year due to limitations in the U.S. system operations, are typically either diverted at, or pass over Morelos Dam. Under the Joint Report, Reclamation will utilize existing facilities and operational flexibilities to arrange for conveyance of 10,000 AF of non-storable flows to the Bypass Drain during periods when non-storable flows are identified. Water deliveries to Mexico required by the 1944 Water Treaty and appropriate implementing protocol will not be affected, nor will water deliveries to U.S. water users. The primary environmental effect in the U.S. would be increased dilution of the concentrate discharged from the YDP into the Bypass Drain, resulting in more Bypass Drain flows at a lower salinity than would otherwise occur without the joint cooperative actions.

Non-storable flow events lasting for more than 24 consecutive hours offer the best opportunity to convey non-storable flows to the Bypass Drain. Based upon five years of data collated and reviewed by Reclamation's Water Operations Group, non-storable flow events of more than one day typically occur seven times per year (a maximum of 12 events per year, and a minimum of two events per year). The volume of these flows is sufficient to meet the 10,000 AF amount of non-storable flows identified in the Joint Report. Since these non-storable flows are variable, it is impossible to quantify the beneficial effect of the additional dilution, since the timing and quantities of the flows are not known. The potential environmental impacts from reduced flow in the river below Parker Dam due to diversion of the non-storable flows was addressed and determined not be significant in the Drop 2 Storage Reservoir Project Final EA. Other than the minor water quality benefits in the Bypass Drain, and insignificant impacts from reduced flow below Parker Dam, no other environmental impacts in the U.S. would occur from Reclamation's implementation of the actions identified in the Joint Report.

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4.0 Consultation and Coordination

Scoping

In advance of the release of this document, two public scoping meetings were held on Wednesday, October 8, 2008, and Monday, February 2, 2009 (IBWC Citizen's Forum). A press release regarding the scoping meeting held on October 8, 2008 was widely distributed on September 25, 2008. Representatives from several groups which could not attend the October scoping meeting asked for further information on the Proposed Action. In response, Reclamation provided the information and requested further comments and relevant information specifically regarding the Cienega. These comments were utilized in the development of the Draft EA and associated Appendices. In addition, tours of the YDP may be arranged through YAO, during which the Proposed Action is discussed. Several groups have availed themselves of these tours, to include the U.S.-Mexico Border Field Coordinating Committee (October 2008), and the Colorado River Joint Cooperative Process, as part of their Bi-National Field Trip (January 2009). Finally, Reclamation consulted bi-nationally (see Appendix C) and with the USFWS (see Appendix D).

Scoping Timeline

September 25, 2008	Press Release for Public Scoping Meeting
October 8, 2008	YDP Pilot Run Scoping Meeting, Yuma, Arizona
November 14, 2008	Initial Consultation Meeting with IBWC and Mexico
February 2, 2009	IBWC Citizen's Forum, El Centro, California
February 12, 2009	Second Consultation with IBWC and Mexico
March 30, 2009	Conference call with IBWC-US
April 8, 2009	Third Consultation with IBWC and Mexico
May 1, 2009	Release of Draft YDP EA for Public Comment <ul style="list-style-type: none"> • Press Release • Notification of interested parties via email • Notification postcards mailed
June 1, 2009	13 comment letters received on the Draft EA
June 2, 2009	Colorado River Joint Cooperative Bi-National Meeting, San Diego, CA
July 1, 2009	Conference call with IBWC-US

Distribution List

Reclamation provided notice of the availability of the Draft EA through postcards, emails, press releases and internet postings. In addition, notice of the availability of the Draft and Final EAs was distributed to the following individuals, organizations and agencies:

Agencies:

Arizona Department of Environmental Quality
Arizona Department of Water Resources
Arizona Game and Fish Department
California Department of Fish and Game
Center for Biological Diversity
Central Arizona Project
City of Yuma
Coachella Valley Water District
Cocopah Indian Tribe
Colorado River Board of California
CONAGUA (Mexicali, B.C., Mexico)
Defenders of Wildlife
Environmental Defense
Fort Yuma Quechan Indian Tribe
Imperial Irrigation District
International Boundary and Water Commission, U.S. and Mexican Sections
Las Vegas Valley Water District
Living Rivers/Colorado Riverkeeper
Maricopa Audubon Society
Metropolitan Water District
Pacific Institute
Research Center for Food and Development (CIAD) – Sonora, Mexico
Rural Metro Fire Department
San Diego County Water Authority
Sierra Club—Southwest Rivers Committee
Sonoran Institute
Southern Nevada Water Authority
Squires Sanders and Dempsey, LLP
The Yuma Sun
U.S. Army Corps of Engineers
U.S. Customs and Border Patrol, Yuma Sector
U.S. Customs and Border Patrol, Washington Office
U.S. Bureau of Land Management, Yuma Field Office
U.S. Fish and Wildlife Service, Arizona Ecological Services Field Office
Western Area Power Authority
Yuma Audubon Society
Yuma County

Yuma County Water Users Association
Yuma Regional Medical Center

Individuals:

P.A. "Doc" Burdick
Jim Cherry
Dr. Edward P. Glenn
Jack Kretzer
R.A. Youngs

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