APPROVED
by the Board of Directors of
The Metropolitan Water District
of Southern California
at its meeting held

DEC 13 1994

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MWD
METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Karen E. Darff
EXECUTIVE SECRETARY

8-2

November 29, 1994

To: Board of Directors (Engineering and Operations Committee--Information) (Finance and Insurance Committee--Action) (Water Problems Committee--Action)

From: General Manager

Subject: Authority to Enter into an Agreement Relating To the Construction of a Concrete Lined Canal Parallel to the Existing All American Canal and a Memorandum of Understanding for Negotiating a Funding Agreement for the Construction, Operation, and Maintenance of Regulating Reservoirs with Imperial Irrigation District

The All American Canal Lining Project (Project) was authorized in Title II of Public Law 100-675 (Act). The Act authorized the Secretary of the Interior (Secretary) to construct a new lined canal or line the previously unlined portions of the All American Canal from the vicinity of Pilot Knob to Drop 4. The conserved water would be made available for consumptive use by the Palo Verde Irrigation District (Palo Verde), Coachella Valley Water District (Coachella), Imperial Irrigation District (Imperial), and Metropolitan (collectively, the California Contractors) in accordance with the priorities contained in their respective Colorado River water delivery contracts with the Secretary. No federal funds were authorized to be appropriated as funding would be provided by only those California Contractors choosing to participate. In addition to funding the costs of the Project, the participating contractor(s) would be required to pay the remaining net obligations due the United States for construction of the All American Canal owed on November 17, 1988. In order to implement the Project the participating contractor(s) must enter into a construction and funding contract with the Secretary. The Act also provided Imperial an opportunity to become the sole participating contractor. Imperial announced its intent to do so in January 1990.

Since January 1990, Metropolitan has been working with Imperial, Coachella, and the U.S. Bureau of Reclamation (Reclamation) to move the Project forward. Those efforts have included:

(a) completion of the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) documentation,

(b) development of the "Agreement Relating To the Construction of a Concrete Lined Canal Parallel to the Existing All American Canal" (Agreement) among Imperial and Metropolitan by which Imperial would implement the Project with funds provided by Metropolitan,

(c) development of the "Memorandum of Understanding for Negotiating a Funding Agreement for the Construction, Operation, and Maintenance of Regulating Reservoirs with Imperial Irrigation District" (MOU) by which Metropolitan would commit to negotiate in good faith with Imperial an agreement for Imperial to construct additional regulatory reservoirs not related to the Project within Imperial's service area with funds provided by Metropolitan,

(d) development of a draft construction and funding contract for the Project as required by the Act to provide for the Secretary's oversight responsibilities for the Project,

(e) development of a draft environmental mitigation agreement for the Project,

(f) coordination with the U.S. Section of the International Boundary and Water Commission in working toward a resolution of Mexico's issues with the Project; and

(g) work toward resolution of the San Luis Rey River water rights dispute among the La Jolla, Rincon, San Pasqual, Pauma and Pala Bands of Mission Indians and the City of Escondido, the Escondido Mutual Water Company, and Vista Irrigation District.

Although full resolution has not been obtained on all of the above elements related to the Project, agreement has been reached between the negotiators for Imperial and Metropolitan on the principle provisions of the Project as contained in the Agreement and MOU. In addition, a number of the comments addressed by Coachella and Reclamation have been included in the Agreement. Accordingly, it would be appropriate to take the next step in the process toward implementing the Project by approving the Agreement and MOU with Imperial, recognizing that the principles and obligations thereunder are conditioned on resolution of

items (d), (e), (f), and (g) above which are subject to approval by your Board.

Under the Agreement, the Project consists of a 23 mile concrete-lined canal parallel to the All American Canal from 1.6 miles downstream of Pilot Knob to Drop 3, with the option to defer the section between Drop 2 and Drop 3 based on economic considerations. Metropolitan would fund the actual costs of the Project, including construction, mitigation, net additional operation, maintenance, repair and replacement costs, and construction of a regulating reservoir or other facilities to offset the loss of regulating and storage capacity of the All American Canal that would result from the Project, if any. Metropolitan would also fund Reclamation's costs to oversee Project implementation. As mandated by the Act, Metropolitan would advance a total sum of $3,086,841 to Imperial, Coachella, and the City of San Diego for their respective remaining net obligations due the United States for construction of the All American Canal owed on November 17, 1988. Imperial has taken the position that payment of such remaining obligations includes the construction of Imperial Dam, with which Metropolitan disagrees. In order to permit the Project to move forward without resorting to litigation or prejudicing Metropolitan's position, an additional payment of $1,294,230 to Imperial is proposed in the Agreement.

In addition, the Agreement was initially drafted to be among Imperial, Coachella, and Metropolitan. However, Coachella has taken the position that payment of the remaining net obligations due the United States for construction of the All American Canal include approximately $38 million for the concrete-lined canal completed in 1980 that replaced the first 49 miles of the Coachella Canal. Coachella has been informed that inclusion of the debt obligation for the concrete lining of the first 49 miles of the Coachella Canal was not the intent of Congress or the parties that drafted the Act. Further, the language of the Act does not in our view support Coachella's position. As Coachella continues to maintain this position, the Agreement has been revised to remove Coachella as a signatory with the understanding that its approval would be sought, or absent such approval, an evaluation of the need for litigation to seek a declaratory judgment would be made.

It is anticipated the Project would be completed in 1999 assuming that planning and design activities begin in 1995. Upon completion it is estimated that 67,700 acre-feet per year of Colorado River water would

be conserved. The estimated capital cost of the Project is $119.6 million (escalated dollars) and the annual net additional operation, maintenance, repair and replacement costs are estimated to be $31,000. Assuming an 8 percent discount rate and a 55-year term, the unit cost of the water conserved is $144 per acre-foot. If a California Contractor other than Metropolitan uses any portion of the conserved water, in accordance with the Act and as provided in the Agreement, that California Contractor would be required to reimburse Metropolitan for the cost of the conserved water used. In accordance with the Act, the actual amount of water conserved by the Project would be determined by the Secretary in consultation with the California Contractors.

Implementation of the Project would be administered by an All American Canal Lining Coordinating Committee (Committee) consisting of one member appointed by Imperial, one member appointed by Metropolitan, a Committee chairman appointed by the Metropolitan and Imperial members, and a non-voting representative of Reclamation. The Committee would approve all aspects of the Project--design, construction, mitigation, operation, maintenance, repair and replacement. Also, the Committee would review and approve annually the budgeting of funds to pay the costs of the Project. Reclamation's role as an advisory member on the Committee is to facilitate the Secretary's oversight responsibility mandated by the Act.

Following the completion of the Project, the term of the Agreement would be for a period of 55 years. Subject to Imperial's approval, at least one year but no more than 10 years before expiration of the term, Metropolitan may request an extension for an additional 55 years. The Agreement incorporates incentives for Metropolitan to request an extension and for Imperial to approve such a request.

The Agreement would become effective upon:

(1) receipt of written approval from the Secretary, Palo Verde, and Coachella, unless waived by Imperial and Metropolitan,

(2) the entry of a declaratory judgment as to the intent of the Act, unless waived by Imperial and Metropolitan, and

(3) Metropolitan, Imperial, and the Secretary entering into a construction and funding contract.

Your Board is required to review and consider the Environmental Impact Statement/Environmental Impact Report (EIS/EIR) prior to authorizing execution of the Agreement. The EIS/EIR was released to the public on April 19, 1994. Reclamation executed the Record of Decision on July 29, 1994 which concluded the environmental documentation process pursuant to NEPA. On August 16, 1994 pursuant to CEQA, Imperial's Board of Directors certified the EIS/EIR, adopted a set of Findings of Fact and a Mitigation Monitoring Program, and approved the Project. Metropolitan's staff participated in the development of the environmental documentation. Attachment 1 is the summary chapter of the EIS/EIR and includes a list of Project impacts and mitigation in tabular format. Copies of the EIS/EIR are available in the Executive Secretary's office.

As a condition of entering into the Agreement, Imperial and Metropolitan would enter into the MOU, which obligates Metropolitan to negotiate in good faith an agreement to provide for the construction and funding of one or more regulating reservoirs within Imperial's service area boundary. Such an agreement would be contingent on the Secretary granting Metropolitan the right to use of Colorado River water captured by the reservoir(s) which would otherwise flow to Mexico in excess of its scheduled delivery had the reservoir(s) not been in place (Salvaged Water). Under such an agreement, the use of the Salvaged Water by Metropolitan would necessarily not be considered to be a part of any Lower Basin State's apportionment under the Decree of the U.S. Supreme Court in Arizona v. California dated March 9, 1964, as it would be conserved through extraordinary means. Reclamation's May 1994 draft regulations for administering entitlements to Colorado River water in the Lower Colorado River Basin imply that the Regional Director could enter into short-term commitments for the use of Salvaged Water. Presently, Reclamation is considering the development of long-term plans for the capture and use of Salvaged Water.

Recommendations

It is recommended that the following actions be taken by your Board:

1. That your Board certify that it has reviewed and considered the Final Environmental Impact Statement/ Environmental Impact Report for the All American Canal Lining Project prepared by Reclamation. Advisory committees of the Board acting upon this letter are also required to review and consider this information.

2. That the General Manager be authorized to execute the Agreement Relating To the Construction of a Concrete Lined Canal Parallel to the Existing All American Canal and a Memorandum of Understanding for Negotiating a Funding Agreement for the Construction, Operation, and Maintenance of Regulating Reservoirs with Imperial Irrigation District substantially in accordance with the terms outlined in this letter and in a form approved by the General Counsel.

John R. Wodraska
General Manager

Submitted by:

Debra C. Man
Chief of Planning and Resources

Concur:

John R. Wodraska
General Manager

JLS:hah

Attachments

SUMMARY

This final environmental impact statement/ final environmental impact report (FEIS/FEIR) has been prepared to evaluate the environmental aspects of a proposed project to control seepage from the All-American Canal (AAC). The project lies along a 29.9-mile reach of the existing unlined AAC which begins just south of Pilot Knob and ends at Drop 4, where the canal approaches the irrigated area of the Imperial Irrigation District (IID) in Imperial County, California (general location map). The reach traverses the East Mesa and runs along the international boundary with Mexico. The proposed action is to "line" a 23-mile section of the canal by constructing a concrete-lined canal parallel to the existing canal.

PURPOSE AND NEED

The purpose of the AAC Lining Project is to conserve seepage lost from the unlined AAC. The conserved water is needed in the southern California coastal area to offset a projected water shortage of 1.2 million acre-feet that is expected by the year 2010. The proposed project has the potential to conserve about 67,700 acre-feet per year.

BACKGROUND

The existing unlined AAC, authorized by the Boulder Canyon Project Act (Public Law (P.L.) 70-642, December 1928), was constructed in the 1930's by the Bureau of

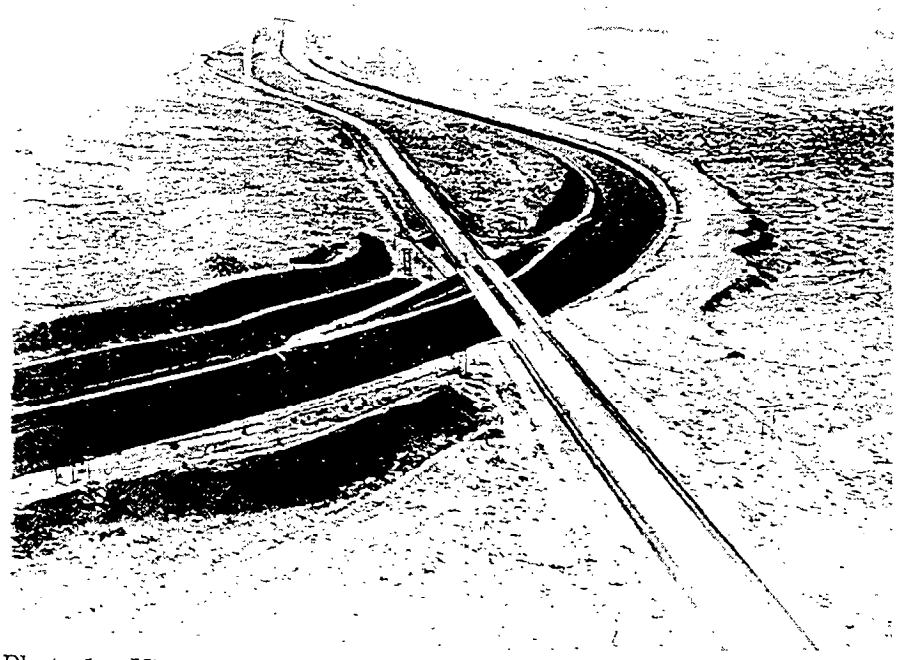

Photo 1.—View looks west over the All-American Canal as it approaches the sand dunes. The Interstate 8 highway crossing is in the foreground.

Reclamation (Reclamation) and began delivering water in the 1940's. The unlined canal was constructed in sandy desert soils. Its width varies from 196 to 171 feet in the section under consideration. The AAC conveys over 3 million acre-feet of water from the Colorado River annually for the Imperial and Coachella Valleys. The water is diverted from the Colorado River at Imperial Dam. The AAC supplies irrigation water on a year-round basis.

Although lining the AAC has been considered for decades, incentives to do so have not materialized until recently. On November 17, 1988, P.L. 100-675 authorized the Secretary of the Interior (Secretary) to line the canal or recover the seepage from the canal using construction funds from California water agencies entitled to the use of Colorado River water (attachment A).

ALTERNATIVES

The canal must remain in service continually. Thus, the range of physical options was limited to lining the existing canal under water, constructing a new concrete-lined canal parallel to the existing canal, or recovering the seepage from wells along the canal.

Although the greatest seepage reduction would be attained by lining the entire 29.9-mile section of canal under consideration, an expensive program would be required to mitigate the impacts on seepage-induced wetlands. Thus, the canal lengths considered for lining were Pilot Knob to Drop 3 and Pilot Knob to Drop 4. These alternatives were developed using both physical options; namely, lining the existing canal or constructing a new parallel canal. A well field alternative was developed with wells along the canal between Pilot Knob and midway between Drops 1 and 2. Farther west, well pumping would have increased seepage from the canal. The required No Action Alternative was included for comparison.

The scoping process produced the alternatives listed in the box below.

Alternative	Description
Parallel Canal Alternative	**Preferred Alternative** - New parallel canal from 1 mile west of Pilot Knob to Drop 3 (23 miles)
Drop 3 Alternative	In-place lining from Pilot Knob to Drop 3 (24.6 miles)
Drop 4 Alternative	In-place lining from Pilot Knob to Drop 4 (29.9 miles)
Well Field Alternative	Wells along the canal between Pilot Knob and Drop 2 (15 miles)
No Action	Canal remains unlined (29.9 miles)

The preferred alternative would be to construct a parallel canal along the existing canal from 1 mile west of Pilot Knob to Drop 3. The new canal would have a top width about two-thirds as wide as the existing canal and would be about 40 percent deeper.

USE OF THE CONSERVED WATER

Public Law 100-675 provides that the conserved water would be made available to specified California contracting water agencies according to established priorities. The priorities are structured so that if the conserved water is not used by IID, Coachella Valley Water District (CVWD), or Palo Verde Irrigation District, the conserved water would be available for use by the Metropolitan Water District of Southern California (MWD).

Public Law 100-675 provides that California agencies currently having contracts with the Secretary may contract with the Secretary to line the canal and gives IID the option of becoming the sole participating contractor for a period not to exceed 15 months after enactment.

MWD has expressed interest in funding the project in return for use of the conserved water when available. This is the general premise under which the project is being developed. The existing Colorado River Aqueduct, capable of diverting 1.3 million acre-feet per year, would be used to transport the conserved water from Lake Havasu to the southern California coastal area.

SUMMARY OF PHYSICAL PROPERTIES AND COSTS

Table S-1 presents a comparison of the physical differences and cost variations among the alternatives.

The project cost includes the cost of mitigation. The cost per acre-foot of water conserved indicates the relative cost effectiveness of each alternative. The cost per acre-foot was computed by combining the estimated costs of implementing and operating the project, converting those costs to an annual equivalent cost, and then dividing by the amount of water conserved.

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The environmental aspects of primary concern are the potential loss of seepage-induced wetlands habitat along the canal and the reduction in the fish population in the canal. The mitigation plans developed for each of the action alternatives would permit their implementation with no significant loss of environmental resources. Moreover, the preferred alternative achieves a national wetlands planning objective of "avoidance" of impact to a 1,422-acre wetlands complex between Drops 3 and 4.

Ground Water

A large ground-water aquifer, known locally as the Colorado River Aquifer, lies under the canal. This aquifer extends north under the East Mesa of the Imperial Valley and south across the international boundary with Mexico under the Mexicali

Table S-1.—Summary of physical properties and design elements and costs

Dimension	Existing canal	Parallel Canal Alternative	Drop 3 Alternative	Drop 4 Alternative	Well Field Alternative
Length involved (miles)	[1]29.9	23.0	24.6	29.9	15.0
Excavation volume (million cubic yards)	—	25.0	0.8	1.0	—
Concrete volume (cubic yards)	—	214,000	265,000	320,000	800
Sand and gravel volume (cubic yards)	—	185,000	355,000	535,000	41,000
Top width[2] (feet)	196	120	215	215	196
Water depth[2] (feet)	16.6	23.1	[3]15.5	[3]15.5	16.6
Sideslopes[4]	2:1	1-1/2:1	2-1/2:1	2-1/2:1	2:1
Water volume[5] (acre-feet)	8,630	6,800	8,900	9,300	8,620
Water velocity at full flow[6] (feet per second)	3.8	5.2	4.1	4.1	3.8
Water conserved annually (acre-feet)	—	67,700	66,700	68,700	68,000
Construction cost[7] (1990 $ millions)	—	86.4	105.7	137.9	21.0
Cost per acre-foot of water conserved (1990 $)[8]	—	109	135	171	69
Operation and maintenance annual cost increase (1990 $)	—	14,000	14,000	26,000	[9]2,930,000

[1] From Rock Section 2 at Pilot Knob to Drop 4.
[2] Between Pilot Knob and Drop 1 at full canal flow. Downstream from Drop 1, the dimensions are approximately 88 percent of values shown.
[3] Checked to depth of 16.6 feet at upstream end of Drop 1.
[4] Horizontal distance to vertical distance.
[5] Entire 29.9 miles. Does not include effect of silt deposition in canal.
[6] Average velocity in canal at maximum waterflow (10,155 cubic feet per second). Velocity at sides of canal is less than average. Velocity at center of canal is greater than average.
[7] Includes cost of mitigation.
[8] For comparison purposes; based on cost recovery at 8-percent interest over an assumed 50-year period.
[9] Annual equivalent; based on future price escalation of 5 percent per year.

Valley. The seepage through the unlined canal bottom has raised the ground-water level under the canal as much as 40 feet. There has been extensive pumping from wells in Mexico since the 1950's. Since that time, the ground-water gradient is to the south, which causes most of the seepage to flow under the international boundary into the Mexicali Valley of Mexico, where seepage augments local ground water pumped from wells for irrigation. The high ground water also has induced wetlands vegetation along the canal.

The preferred alternative would reduce seepage from the canal by approximately 67,700 acre-feet per year. This would allow the ground-water level under the canal upstream from Drop 3 to decline and would reduce one source of ground-water recharge for the Mexicali Valley. Seepage from the AAC contributes 10 to 12 percent of the Mexicali Valley ground-water recharge. If pumping in Mexico continues at the current rate, it would cause the ground water under the canal to decline to a greater depth than prior to operation of the canal and would ultimately withdraw water from under the East Mesa of Imperial County. The ground-water table under part of the northeastern portion of the Mexicali Valley would decline.

The Lower Colorado Water Supply Project well field is being constructed along the canal in the Sand Hills area. Lining of the AAC was taken into account as the project was planned, and the wells have been designed to operate with a lower ground-water table.

Surface Water

The preferred alternative would increase the usable supply of water in the Colorado River by 67,700 acre-feet per year. It would reduce the amount of water diverted into the AAC by that amount, which is about 2 percent. Diversion of the conserved water at Lake Havasu would reduce the flow in the Colorado River downstream from Parker Dam by an average of approximately 94 cubic feet per second.

After canal flow is diverted into the parallel canal, the volume of water in the entire 29.9-mile canal section under study would reduce from 8,630 acre-feet to 6,800 acre-feet under full flow conditions, less under partial flow conditions.

Water Quality

Under the preferred alternative, salinity of the Colorado River below Parker Dam would tend to increase very slightly (unmeasurable increase). Therefore, the preferred alternative would have no significant impacts on the quality of water in the AAC or in the Colorado River. The salinity of the pumped ground water under the AAC at the Lower Colorado Water Supply well field is projected to increase by 2 milligrams per liter per year as a maximum probable impact estimate. The quality of current drainage water in the northeastern portion of the Mexicali Valley would deteriorate, based on information provided by the Government of Mexico.

Air Quality

The preferred alternative would not have any permanent impacts on air quality. Construction emission of dust and exhaust products would be controlled under regulations of the Imperial County Air Pollution Control District. Typical construction dust would be controlled by water spray.

Wetlands Habitat

The seepage-caused high ground water along the canal has resulted in moist soil conditions in topographically low areas along the canal. These conditions have resulted in wetlands vegetation being established in these places, mainly in the wetlands complex between Drops 3 and 4. The wetlands vegetation provides habitat for various species of wildlife; therefore, the potential loss of wetlands is of particular concern because the wetlands in question provide habitat for the endangered Yuma clapper rail, and because of the national goal of no overall net loss of wetlands.

An interagency biological work group was formed to analyze the potential impact on wetlands habitat. Representatives of Reclamation, U.S. Fish and Wildlife Service, Bureau of Land Management (BLM), the California Department of Fish and Game, MWD, IID, and CVWD developed a habitat rating system that was used to plan mitigation features for the potential habitat losses.

The preferred alternative and Drop 3 Alternative avoid impact to a 1,422-acre wetlands complex between Drops 3 and 4. To compensate for the loss of isolated tracts of wetlands and canal vegetation along the canal upstream from Drop 3, the wetlands complex between Drops 3 and 4 would be enlarged slightly.

Wetlands Habitat Along the Colorado River

Beginning about halfway between Blythe and the Imperial Dam, the Colorado River changes from being extensively channelized to having an irregular channel with numerous backwaters on the flood plain. Here the dominant vegetation of cattails and reeds creates a substantial band of vegetation around the backwaters. The wetlands along the river are host to a variety of wildlife, including the federally endangered Yuma clapper rail.

To ensure that the project does not cause an adverse change to wetlands along the Colorado River, future habitat restoration work along the river would include funding of $100,000 to improve backwater along the lower river. Reclamation, in cooperation with the Lower Colorado River Work Group Backwaters Committee, is planning several backwater restoration or enlargement projects along the river. Mitigation for the AAC lining would be accomplished as part of such an improvement project.

Terrestrial Habitat

The canal runs through four terrestrial plant communities—creosotebush scrub, wash woodland, sand dune, and wetlands. At its maximum impact, the preferred alternative would eliminate an estimated 587 acres of desert scrub habitat and 916 acres of sand dune habitat. Project mitigation plans would consist of acre-for-acre replacement of lost habitat. Selection of replacement habitat would be based on ecological equivalency.

This acreage estimate is considered maximum probable impact. After final design of project facilities and determination of staging areas, access roads, and other uses, total acreage will be adjusted based on results of 1993 U.S. Fish and Wildlife Service habitat surveys and in accordance with the Reclamation environmental commitment plan.

Special Status Species

Special status species affected by the project include the federally endangered Yuma clapper rail and the California black rail, birds that depend on marsh habitat. Also included are the flat-tailed horned lizard, the Colorado fringe-toed lizard, and the Andrew's dune scarab beetle, whose habitat is found in the sparsely vegetated desert landscape along the canal.

The preferred alternative avoids a significant effect on the Yuma clapper rail and the California black rail by not lining the canal between Drops 3 and 4. The project mitigation plans would prevent significant impact to other special status species upstream from Drop 3.

Large Mammal Escape

Although there is no documented population of mule deer in the AAC project area, the possibility exists that large mammals could occasionally drink from the canal or cross it. The parallel canal would have concrete sideslopes of 1-1/2 horizontal to 1 vertical and faster velocities than the present canal, which could pose a drowning risk to large mammals. This risk would be mitigated by continuous escape ridges slipformed on the concrete lining. Deflector systems, such as cables with visible buoys, would be installed and maintained upstream of all drop structures to direct large mammals to escape ridges.

Canal Fishery

The canal contains game and nongamefish. The fishery is dominated by channel catfish (about 90 percent) and also contains populations of largemouth bass, sunfish, and flathead catfish. Other species are common carp, threadfin shad, and striped bass. Channel catfish, bass, and sunfish provide recreational fishing, which is permitted.

The preferred alternative would reduce canal bank vegetation that provides food and cover, particularly for shoreline gamefish. The flow velocity also would inhibit spawning. These changes would cause the number of fish in the canal to decline. Mitigation for the changes, aimed at maintaining the recreational fishery, would consist of installing artificial reefs in the lined canal. These artificial reefs would provide cover for hatchling fish and habitat for aquatic organisms on which the hatchlings feed. Alternative mitigation methods would be stocking fish and providing fishery habitat in regulating reservoirs.

Cultural Resources

From Pilot Knob to Drop 4, the AAC occupies land that contains remnants of cultural activity from prehistoric times to recent historical times. The Pilot Knob area, adjacent to the AAC near Yuma, is one of the most significant and sensitive areas of cultural resources in the Colorado Desert and has been designated the Pilot Knob Area of Critical Environmental Concern (ACEC), administered by BLM. Scattered archeological sites also lie along the canal route.

The preferred alternative would avoid the Pilot Knob ACEC. Additional class III archeological surveys would be made prior to construction, and the cultural resources identified would be avoided or professionally recovered and/or documented.

Recreation

Construction activities along the canal would pose minor limitations to off-road recreationists in the Sand Hills area. This impact would be controlled through an interim recreation management plan to be developed with BLM. The potential reduction in gamefish caused by the concrete lining would be mitigated by installing artificial reefs in the lined canal, a measure aimed at maintaining fishing along the canal.

Land Ownership and Use

The preferred alternative would use approximately 1,503 acres of previously disturbed land. The parallel canal would be constructed on Federal land previously set aside for canal construction and operation. The project may require acquisition of land for mitigation.

Sand and Gravel Supplies

The preferred alternative would require approximately 185,000 cubic yards of sand and gravel, in an area in which gravel supplies are not plentiful. Gravel would come from established quarry areas in Imperial County, and possibly from a new source on the Fort Yuma Indian Reservation. Federal, State, and county regulations would be followed.

Transportation

Construction workers and their materials would reach the jobsite via Interstate 8 (I-8) and various local paved and unpaved roads between El Centro and Yuma. Traffic on I-8 and most of the local roads is below capacity, so construction traffic would not significantly affect local transportation.

Hydroelectric Power

Because of reduced diversions, the preferred alternative would reduce hydroelectric power generation along the AAC by approximately 220,000 kilowatthours (kWh) per year, and along the Colorado River at Parker, Davis, and Hoover Dams by a combined amount of approximately 5 million kWh per year.

Project Operating Energy Requirements

The preferred alternative would not require energy to operate.

Public Safety

Public contact with the canal occurs through fishing and swimming in the canal and visitation. Even though the canal is posted against swimming, numerous drownings occur. Most of the drownings take place when illegal aliens attempt to cross the international boundary.

The preferred alternative would make swimming more hazardous due to increased waterflow velocity. Also, the concrete lining eventually would become slippery at and below the water surface because of accumulated silt and aquatic vegetation. This slipperiness would make climbing out of the canal difficult, but its effect would be mitigated by placement of escape ridges on the canal lining. In

addition, signs would be posted on both sides of the canal to warn people of the dangerous waters.

Employment and Income During Construction

The Imperial County unemployment rate has varied from 19.9 percent to over 30 percent during the last decade. This includes workers from Mexicali who work in the Imperial Valley. Construction of the proposed project would provide employment for local citizens and for construction workers from outside of the area. Under the preferred alternative, contractor manpower requirements are estimated at 415 work years, of which about 75 percent are expected to be filled locally.

Local Community Structure

Under the preferred alternative, the number of construction workers and family members arriving from outside the area is expected to be 200. Compared to the populations of El Centro (31,650) and Yuma (about 49,000) and to the Imperial County population of 115,700, the construction arrivals would be small in number and are not expected to have a significant effect on the structure and utilities of local communities. Because of the short duration of the construction period and the mild climate, many workers will bring mobile homes and travel trailers.

Immigration From Mexico

The preferred alternative would not have a significant effect on the operations of the Immigration and Naturalization Services' Border Patrol (Border Patrol). The Border Patrol would need to increase its surveillance activities during active project construction.

Growth Inducement

The preferred alternative would not induce growth in the Imperial Valley, where the project would be constructed, or in the southern California coastal area, which contemplates use of the water to meet existing needs.

Indian Trust Assets

During the environmental impact statement process, Reclamation representatives met and corresponded with the Quechan Indian Tribe (Tribe) regarding the project, the alternatives, and potential impacts to Indian trust assets.

Two potentially affected assets were identified: construction workers may need to cross reservation lands, and the Tribe would like to sell gravel for use in project construction. The Tribe was receptive to negotiating an agreement to allow workers to cross reservation lands. A final agreement to allow workers to cross reservation lands would be reached after the final environmental impact statement is filed and a record of decision issued. Reclamation is receptive to purchasing gravel from the Tribe; however, this gravel would have to be tested for suitability by the contractor.

Table S-2 presents a comparison of the principal differences among alternatives. Table S-3 summarizes proposed mitigation measures and their estimated costs for the preferred alternative.

Table S-2.—Summary of principal environmental aspects for All-American Canal

RESOURCE CATEGORY	PARALLEL CANAL ALTERNATIVE		DROP 3 ALTERNATIVE	
	POTENTIAL PROJECT IMPACT	NET IMPACT AFTER MITIGATION	POTENTIAL PROJECT IMPACT	NET IMPACT AFTER MITIGATION
GROUND WATER	Water table would drop to precanal levels under 23 miles of canal.	Same.	Water table would drop to precanal levels under 24.6 miles of canal.	Same.
WATER QUALITY	Turbidity during construction. No permanent change in canal water quality. Unmeasurable increase in salinity of Colorado River.	Same.	Turbidity and possible pH change during construction. No permanent change in canal water quality. Unmeasurable increase in salinity of Colorado River.	Same.
WETLANDS ALONG THE ALL-AMERICAN CANAL	123 acres of scattered habitat along canal would be lost.	No net loss of habitat value.	123 acres of scattered habitat along canal would be lost.	No net loss of habitat value.
SURFACE WATER AND WETLANDS ALONG THE COLORADO RIVER	Lower Colorado River and backwaters: 1/2-inch reduction in water level. 4-1/2-acre reduction in water surface area.	No net loss of habitat value.	Lower Colorado River and backwaters: 1/2-inch reduction in water level 4-1/2-acre reduction in water surface area.	No net loss of habitat value
TERRESTRIAL HABITAT	Acres of habitat lost: 587 desert scrub 916 sand dune.	No net loss of habitat value.	Acres of habitat lost: 134 desert scrub 153 sand dune.	No net loss of habitat value.
SPECIAL STATUS SPECIES	Loss of habitat for flat-tailed horned lizard and rare plants.	No net loss of habitat for flat-tailed horned lizard or rare plants. Reduction of rare plants.	Minor impacts during construction.	No impact.
CANAL FISHERY	Species and numbers of fish would be greatly reduced.	Numbers would be reduced, but gamefish would be maintained.	Species and numbers of fish would be greatly reduced.	Numbers would be reduced, but gamefish would be maintained.
CULTURAL RESOURCES	Potential disturbance of some archeological sites.	No significant impact.	Potential disturbance of some archeological sites.	No significant impact.
HYDROELECTRIC POWER	Annual power loss: AAC - 220,000 kWh[1] Colorado River - 5.1 MkWh[2]	Same.	Annual power loss: AAC - 168,000 kWh Colorado River - 5.0 MkWh.	Same.
EMPLOYMENT AND INCOME DURING CONSTRUCTION	415 contractor work years. Economic impact - $40 million to local economy.	Same.	420 contractor work years. Economic impact - $50 million to local economy.	Same.
PROJECT ENERGY OPERATING REQUIREMENTS	No impact.	Same.	No impact.	Same.

[1] kWh = kilowatthour
[2] MkWh = million kilowatthours

Table S-2.—Summary of principal environmental aspects for All-American Canal (continued)

DROP 4 ALTERNATIVE		WELL FIELD ALTERNATIVE		
POTENTIAL PROJECT IMPACT	NET IMPACT AFTER MITIGATION	POTENTIAL PROJECT IMPACT	NET IMPACT AFTER MITIGATION	NO FEDERAL ACTION
Water table would drop to precanal levels under 29.9 miles of canal.	Same.	Water table would drop to precanal levels under 17 miles of canal.	Same.	No impact.
Turbidity and possible pH change during construction. No permanent change in canal water. Unmeasurable increase in salinity of Colorado River.	Same.	Potential slight increase in salinity of canal water. No change in salinity of Colorado River.	Same.	No impact.
1,518 acres in wetlands complex along canal would be lost.	No net loss of habitat value.	No impact.	No impact.	No impact.
Lower Colorado River and backwaters: 1/2-inch reduction in water level. 4-1/2-acre reduction in water surface area.	No net loss of habitat value.	Lower Colorado River and backwaters: 1/2-inch reduction in water level. 4-1/2-acre reduction in water surface area.	No net loss of habitat value.	No impact.
Acres of habitat lost: 183 desert scrub 153 sand dune.	No net loss of habitat value.	Acres of habitat lost: 5 desert scrub 1 sand dune.	No net loss of habitat value.	No impact.
Minor impacts during construction. Impacts to Yuma clapper rail and California black rail.	No impact.	No significant impact.	No significant impact.	No impact.
Species and numbers of fish would be greatly reduced.	Numbers would be reduced, but gamefish would be maintained.	No impact.	No impact.	No impact.
Potential disturbance of some archeological sites.	No significant impact.	No significant impact.	No significant impact.	No impact.
Annual power loss: AAC - 267,000 kWh Colorado River - 5.2 MkWh.	Same.	Annual power loss: AAC - 105,000 kWh Colorado River - 5.1 MkWh.	Same.	No impact.
440 contractor work years. Economic impact - $56 million to local economy.	Same.	14.9 contractor work years. Economic impact - $1.3 million to local economy.	Same.	No impact.
No impact.	Same.	Increased power demand of 10.7 MkWh per year.	Same.	No impact.

Table S-3.—Estimated costs of mitigation commitments for the preferred alternative

Mitigation commitment	Cost
Lower Colorado River backwater restoration fund	[1]$100,000
Wetlands mitigation	[2]150,000
One-to-one replacement of disturbed flat-tailed horned lizard habitat and sand dune habitat. Purchase of up to approximately 1,503 acres[3] at $500 per acre	[4]751,500
Installation of tire reefs to replace lost shoreline canal fishery habitat	[2]250,000
Large mammal/human escape ridges	[5] —
Archeological surveys	[2]100,000
Stockpiling and recontouring of surface soils	[6]60,000
Develop interim recreation plan	[7]5,000
Total capital costs	$1,416,500
Mitigation annual operation and maintenance	[2]$46,000

[1] From chapter III, "Wetlands Along the Colorado River."
[2] From Engineering Appendix to the draft environmental impact statement/environmental impact report.
[3] Maximum probable impact estimate, from chapter III, "Special Status Species."
[4] Assumed price of $500 per acre for undeveloped land in Imperial Valley. Replacement lands would be acquired in accordance with section 203(a)(2) of Public Law 100-675 (attachment A of the FEIS/FEIR). In addition, acreage may be reduced based on actual construction impacts.
[5] Cost of incorporating this measure is included in the cost of constructing the canal lining.
[6] U.S. Fish and Wildlife Service estimate for Coachella Canal Lining Project. Assumed to be approximately accurate for the All-American Canal Lining Project.
[7] Bureau of Reclamation estimates. Implementation costs are included in the cost of constructing the canal lining.

CONSULTATION AND COORDINATION

Development of the canal lining alternatives and mitigation measures has been coordinated with the California water agencies affected, Federal and State agencies having responsibility for natural resources, the Quechan Indian Tribe, and the general public. Numerous working sessions and meetings occurred among interested agencies, and public meetings were held in the project area. Through the United States Section of the International Boundary and Water Commission, the United States has held consultations with Mexico regarding the lining project as stipulated in Commission Minute No. 242, Point 6, pursuant to the 1944 Water Treaty between the United States and Mexico.