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United States Government Accountability Office  
Washington, DC 20548

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April 24, 2008

Congressional Requesters

*Subject: International Boundary and Water Commission: Two Alternatives for Improving Wastewater Treatment at the United States-Mexico Border*

For many years, untreated wastewater originating in Tijuana, Mexico, has entered the United States, largely via the Tijuana River. Tijuana's sewage system does not have the capacity to treat all of the city's wastewater, and some areas of the city are not connected to the sewer system. Tijuana's higher elevation results in sewage flowing downhill into California and out to the Pacific Ocean, causing beach closures in southern California. In the 1990s, the U.S. and Mexican Sections of the International Boundary and Water Commission collaborated with the U.S. Environmental Protection Agency (EPA) to address the problem by constructing the South Bay International Wastewater Treatment Plant (SBIWTP) in San Ysidro, California.<sup>1</sup> The SBIWTP began providing the first level of treatment, known as primary treatment, to 25 million gallons per day (mgd) of Mexican wastewater in 1997. However, the part of the facility that would have provided secondary treatment, allowing the wastewater to meet Clean Water Act (CWA) standards for discharge into the Pacific Ocean, was not constructed due to a lack of funding and legal challenges. As a result, water discharged from the SBIWTP is only partially treated and has never complied with the requirements of the CWA.

Over more than a decade, the U.S. Section of the International Boundary and Water Commission (USIBWC) has considered a variety of alternatives to bring the wastewater into CWA compliance, and now faces a federal court order requiring it to achieve CWA compliance by September 30, 2008. The USIBWC is currently considering two proposals: (1) upgrading the SBIWTP to provide secondary treatment at the existing plant site, or (2) building a new plant in Mexico where wastewater that received primary treatment at the SBIWTP would be pumped for secondary treatment, as proposed by Bajagua, LLC.<sup>2</sup> Under both proposals, the treated effluent would be pumped into U.S. waters of the Pacific Ocean through a pipeline known as the South Bay Ocean Outfall, a facility used by both the USIBWC and the City of San Diego. (See encl. II for additional discussion of the context for

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<sup>1</sup>Building of the SBIWTP was provided for in July 1990 by an international agreement known as a treaty minute between the U.S. and Mexican Sections of the International Boundary and Water Commission. They are responsible for resolving water and boundary issues along the U.S.-Mexican border, including constructing and operating wastewater treatment facilities.

<sup>2</sup>Bajagua, LLC is a private company.

this issue, a timeline of significant events in the multiyear effort to address the environmental problems of Mexican wastewater affecting California, a map showing the location of wastewater treatment facilities in the region, and a diagram of the wastewater flows from the proposed facilities.)

In response to an explanatory statement of the House Appropriations Committee that accompanied the 2008 Consolidated Appropriations Act, GAO (1) described the two proposed treatment alternatives, (2) described the estimated costs and timelines for each proposal, and (3) assessed the reliability of these estimates. The explanatory statement directed GAO to report to the Appropriations Committees within 120 days of enactment of the law, which occurred on December 26, 2007. On April 7, 2008, we briefed members of your staffs on our findings. This letter summarizes the main points from our presentation. See enclosure III for a copy of the briefing slides from that presentation.

To conduct this work, we obtained project descriptions and estimated costs and timelines from the USIBWC for the proposed SBIWTP upgrade and Bajagua, LLC for the proposed plant in Mexico. We interviewed representatives of the USIBWC and Bajagua, LLC regarding their estimates, and other stakeholders such as the Commissioner of the Mexican Section of the International Boundary and Water Commission, EPA staff, and staff of the California State and San Diego Regional Water Quality Control Boards. We visited the SBIWTP in San Ysidro, California, existing and under-construction wastewater treatment plants in Tijuana, and the proposed site for the Bajagua plant. We analyzed the reliability of the cost and timeline estimates using GAO's Cost Assessment Guide.<sup>3</sup>

Our work is subject to three key limitations. First, the USIBWC and Bajagua, LLC did not provide complete cost and timeline estimates until the latter half of March, limiting the time available for assessing their reliability. Second, due to time constraints, we did not independently verify the cost or timeline information that was provided to us. Third, we limited our review to the objectives discussed with the staffs of the House and Senate Appropriations Committees and as such did not address a variety of issues, such as (1) independently assessing Tijuana's current or future wastewater treatment needs or the extent to which each proposal addresses those needs; (2) assessing whether Bajagua, LLC could develop the capacity to reclaim and sell water from its proposed plant and whether such sales would reduce costs to the federal government; (3) assessing the extent to which untreated or undertreated sewage from Mexico affects southern California, how these impacts vary between wet and dry periods, and the extent to which each project would address these impacts; or (4) assessing the extent to which the USIBWC managed previous projects within its estimated costs and timeframes.

We conducted this performance audit work from January 2008 through April 2008 in accordance with generally accepted government auditing standards. Those

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<sup>3</sup>GAO, *Cost Assessment Guide: Best Practices for Estimating and Managing Program Costs*, GAO-07-1134SP (Washington, DC: July 2, 2007).

standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. For additional information on our scope and methodology, see enclosure I.

## **Summary of Findings**

Although both proposals are designed to enable the USIBWC to meet CWA requirements, they take different approaches in doing so.

- The USIBWC's proposal would expand the SBIWTP to allow it to provide secondary treatment to the 25 mgd of wastewater already receiving primary treatment at the plant, bringing it to CWA standards. According to the USIBWC, construction would follow a final design which will be provided by an engineering consulting firm in June 2008, based on its update of the original SBIWTP design. U.S. appropriations would pay for the expansion's construction and operations and maintenance (O&M) costs.
- Under the Bajagua, LLC proposal, Bajagua, LLC would contract with another company to design, build, and operate a new facility in Mexico that would provide secondary treatment to 25 mgd of wastewater that would be pumped to the plant after receiving primary treatment at the SBIWTP, bringing it to CWA standards. The Bajagua plant would also have the capacity to provide primary and secondary treatment of up to an additional 34 mgd of wastewater from Tijuana. However, because estimates of Tijuana's future wastewater treatment needs vary, it is unclear when this additional capacity will be needed. Bajagua, LLC does not currently have a detailed design for its plant because it plans to hire a contractor to develop one. Bajagua, LLC would fully finance the initial construction of the new plant, and U.S. appropriations for wastewater treatment services over 20 years would enable Bajagua, LLC to recover the costs of construction and O&M, as well as equity and debt service, management fees, and profits. After 20 years, the ownership of the plant would transfer to the responsible Mexican authorities.

According to data from the USIBWC and Bajagua, LLC for their respective proposals, the estimated costs for the SBIWTP upgrade are lower than the costs for the Bajagua plant, but Bajagua, LLC projects that its plant will be completed about 10 months sooner than the SBIWTP upgrade. However, neither proposal will enable the USIBWC to comply with the current court-ordered deadline; specifically:

- The USIBWC estimates that expanding the SBIWTP will cost \$101.5 million in construction costs, and that total O&M costs for both primary and secondary treatment facilities during the first year of operations will cost about \$16.7 million. The cost to the U.S. federal government would be about \$331 million for construction and operation over a 20-year term in 2008

dollars when adjusted for present value. The USIBWC projects that the expanded SBIWTP would be operational by January 2011.

- Bajagua, LLC estimates that building a new facility in Mexico will cost \$195.6 million, which it will finance. Wastewater treatment services, including recovery of construction costs, O&M costs (which include primary treatment at the SBIWTP), equity and debt service, management fees, and profit, will cost the U.S. federal government \$33.8 million during the first year of operation. Over 20 years, the cost to the federal government would be about \$539 million in 2008 dollars when adjusted for present value. Bajagua, LLC projects that the new plant would be operational by March 2010.

Neither projects' estimates of costs and timelines fully meets GAO's criteria for reliability, but the estimated costs and timelines for the SBIWTP upgrade may be somewhat more reliable than those for the Bajagua, LLC proposal. GAO considers a cost estimate reliable if it follows certain best practices—is well documented, comprehensive, accurate, and credible. The SBIWTP upgrade and the Bajagua plant cost estimates both met some of our criteria for being well documented, comprehensive, and accurate, but overall, the SBIWTP upgrade estimate met more of these criteria than the Bajagua plant estimate. For example:

- The SBIWTP upgrade cost estimate was based on a final design that is in the process of being updated and revised, with cost estimates for detailed project elements rolled up to a total cost of construction, with significant participation and review by USIBWC and SBIWTP technical staff.
- The Bajagua plant cost estimate met some of the criteria for each best practice, but as a preliminary design, did not include the same level of detailed, comprehensive descriptions of project elements and costs, or as clearly explain the sources of data and methodologies used in developing the estimate.
- Both cost estimates met little or none of GAO's criteria for credibility, because neither had been independently reviewed and verified, varied the assumptions to assess sensitivity to changes, or conducted risk or uncertainty analysis to determine the extent to which actual costs may vary from the estimate.

Regarding project timelines, we found that neither project fully met GAO's best practices for scheduling. While it is early in the development stage for both projects, a schedule risk analysis—using statistical techniques to predict the level of confidence in meeting a program's completion date—would be useful in assessing the reliability of the timeline estimates. In the absence of such an analysis, we identified some of the potential risks facing each project that would typically be part of the analysis. We found that the Bajagua, LLC project includes more unresolved issues than the SBIWTP upgrade, such as the need to obtain over

30 permits, approvals, and concessions from both U.S. and Mexican authorities; the need to resolve significant issues in its draft fee-for-services agreement with the USIBWC; and other legal and technical issues which could delay its schedule.

### **Agency and Other Interested Party Comments and Our Evaluation**

We provided a copy of our draft report to the USIBWC and Bajagua, LLC for their review and comment. The USIBWC's and Bajagua, LLC's comments and our detailed responses are presented in enclosures IV and V.

In its written response, the USIBWC said that it generally agreed with our findings and conclusions given the limited scope and timeframe for the review of the two alternatives. The USIBWC also provided technical comments, which we incorporated into the report as appropriate.

In its written response, Bajagua, LLC, commented on several aspects of our draft report, including four main areas of concern.

- Bajagua, LLC said it believed that any comparison of its project with the upgrade of the SBIWTP should conclude that its project is the more timely and cost-effective alternative. We did not assess either project's benefits or make conclusions about which project would be more timely or cost-effective. We limited our work to the objectives discussed with the staff of the House and Senate Appropriations Committees. Specifically, we assessed the reliability of the cost and timeline estimates provided by the USIBWC and Bajagua, LLC against the criteria contained in our Cost Assessment Guide.
- Bajagua, LLC disagreed with our finding that its project has more unresolved issues than the SBIWTP upgrade and stated that our analysis was not supported by the facts. We believe our analysis was correct. Our draft report (now in enclosure III, pages 48-51) noted several areas where key issues remain unresolved, including obtaining necessary permits, negotiating a fee-for-services agreement, and resolving outstanding legal issues. Bajagua, LLC's response provided no additional information to show resolution of these issues. As such, we believe it is appropriate to continue to characterize these issues as unresolved and therefore as uncertainties that could delay the Bajagua project's timeline.
- Bajagua, LLC also listed five issues regarding the SBIWTP upgrade that it believes we did not consider in our draft report, including how the two proposals could affect beach pollution in California, and the USIBWC's track record managing past projects. We agree that we did not address these two issues since they were not part of our scope, as noted in our draft report (now on page 2). The third issue involves the potential for legal action against the SBIWTP, which we addressed in our draft report (now in enclosure III, page 47). Finally, Bajagua, LLC raised two legal and regulatory

issues that do not appear to be factually accurate. Specifically, it said upgrading the SBIWTP could conflict with guidance from the U.S. Environmental Protection Agency (EPA) because Tijuana lacks a pretreatment program for its industrial wastewater. However, according to an EPA official, no such EPA guidance exists and an industrial pretreatment program has been in place in Tijuana since 2001. Bajagua, LLC also said the USIBWC's estimated timeframes did not include the time needed to obtain approval from the California Coastal Commission. However, according to a Commission official, the Commission has already granted approval for the SBIWTP to provide secondary treatment.

- Finally, Bajagua, LLC expressed the view that we should continue with a comprehensive review of the two alternatives, including the potential benefits of the Bajagua project. Bajagua, LLC stated that the explanatory statement calling for this report also requires us to conduct a separate, comprehensive assessment of the two alternatives. While the explanatory statement does make reference to a separate on-going comprehensive GAO review, we did not have such a review on-going. We would consider conducting further work related to wastewater treatment issues in the Tijuana River basin if we received a Congressional request or mandate to do so.

Bajagua, LLC also provided GAO with technical comments, which we incorporated into our report as appropriate.

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We are sending copies of this report to the Commissioner of the USIBWC; Bajagua, LLC; appropriate congressional committees; other interested Members of Congress; and other interested parties. We will also make copies available to others upon request. In addition, the report will be available at no charge on the GAO Web site at <http://www.gao.gov>.

If you or your staffs have any questions about this report, please contact me at 202-512-3841 or [maurerd@gao.gov](mailto:maurerd@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Major contributors to this report were Stephen D. Secrist, Assistant Director; Allen Chan; Brad Dobbins; Terrell Dorn; Richard Johnson; Alison O'Neill; Karen Richey; Anne Stevens; and Heather Whitehead.

A handwritten signature in black ink that reads "David C. Maurer". The signature is written in a cursive style with a long, sweeping tail on the final letter.

David C. Maurer  
Acting Director, Natural Resources and Environment

Enclosures

## **Congressional Addressees**

The Honorable Patrick J. Leahy  
Chairman

The Honorable Judd Gregg  
Ranking Member  
Subcommittee on State, Foreign Operations, and Related Programs  
Committee on Appropriations  
United States Senate

The Honorable Nita M. Lowey  
Chairwoman

The Honorable Frank R. Wolf  
Ranking Member  
Subcommittee on State, Foreign Operations, and Related Programs  
Committee on Appropriations  
House of Representatives

The Honorable Dianne Feinstein  
United States Senate

The Honorable Bob Filner  
House of Representatives

The Honorable Duncan L. Hunter  
House of Representatives

## Scope and Methodology

To conduct this work, we obtained project descriptions, cost estimates, and completion timeline estimates from the U.S. Section of the International Boundary and Water Commission (USIBWC) for the proposed South Bay International Wastewater Treatment Plant (SBIWTP) upgrade and Bajagua, LLC for the proposed plant in Mexico. We interviewed representatives of the USIBWC and Bajagua, LLC regarding their estimates, and other stakeholders such as the Commissioner of the Mexican Section of the International Boundary and Water Commission, U.S. Environmental Protection Agency (EPA) staff and staff of the California State and San Diego Regional Water Quality Control Boards. We visited the SBIWTP in San Ysidro, California, existing and under-construction wastewater treatment plants in Tijuana, and the proposed site for the Bajagua plant.

We conducted our analysis of the cost and timeline estimates using GAO's Cost Assessment Guide.<sup>4</sup> The guide identifies best practices that should be followed to achieve the four characteristics of a high-quality, reliable cost estimate:

1. *Well Documented.* An estimate is thoroughly documented, including source data and significance, clearly detailed calculations and results, and explanations of why particular methods and references were chosen. Data can be traced to their source documents.
2. *Comprehensive.* An estimate has enough detail to ensure that cost elements are neither omitted nor double counted. All cost-influencing ground rules and assumptions are detailed in the estimate's documentation.
3. *Accurate.* An estimate is unbiased, not overly conservative or overly optimistic, and is based on an assessment of most likely costs. Few, if any, mathematical mistakes are present and those that are present are minor.
4. *Credible.* Any limitations of the analysis because of uncertainty or bias surrounding data or assumptions are discussed. Major assumptions are varied and other outcomes are recomputed to determine how sensitive they are to changes in the assumptions. Risk and uncertainty analyses are performed to determine the level of risk associated with the estimate. The estimate's results are cross-checked, and an independent cost estimate is developed to determine whether other estimating methods produce similar results.

The Guide also identifies best practices for conducting reliable project timeline estimates. A project timeline estimate is considered reliable if (1) all activities are

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<sup>4</sup>[GAO-07-1134SP](#).

## Enclosure I

defined; (2) all activities are sequenced; (3) the duration for each activity is estimated; (4) resources such as labor, materials, and overhead are assigned to all activities; (5) a critical path is identified for all activities; (6) float time—the amount of time a task can slip before affecting the critical path—between activities is identified; (7) schedule risk analysis is conducted using statistical methods to determine the amount of time to reserve for contingencies; and (8) the schedule is horizontally integrated (depicts relationships between different program tasks and resources needed for different tasks) and vertically integrated (traces the consistency of data between master-, intermediate-, and detailed-level tasks in the schedule).

Our work is subject to three key limitations. First, we did not receive current and complete cost and timeline estimates until the latter half of March, limiting the time available for assessing their reliability. Second, we did not independently verify the cost or timeline information that was provided to us. Third, we limited our review to the objectives discussed with the staff of the House and Senate Appropriations Committees and as such did not address a variety of issues, such as (1) independently assessing Tijuana’s current or future wastewater treatment needs or the extent to which each proposal addresses those needs; (2) assessing whether Bajagua, LLC could develop the capacity to reclaim and sell water from its proposed plant and whether such sales would reduce costs to the federal government; (3) assessing the extent to which untreated or undertreated sewage from Mexico affects southern California, how these impacts vary between wet and dry periods, and the extent to which each project would address these impacts; or (4) assessing the extent to which the USIBWC managed previous projects within their estimated costs and timeframes.

We conducted this performance audit work from January 2008 through April 2008 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

## **Background and Timeline of Major Events in the Effort to Address Wastewater Problems along the California-Mexico Border**

Wastewater from Mexico has historically flowed into the United States from Tijuana, polluting the Tijuana River estuary and, subsequently, the beaches south of San Diego. The Clean Water Act (CWA) generally prohibits the discharge of pollutants into waters of the United States without a National Pollutant Discharge Elimination System (NPDES) permit.<sup>5</sup> California implements the CWA through its own water quality legislation known as the Porter-Cologne Act. Pursuant to these acts, the San Diego Regional Water Quality Control Board issues permits to discharging facilities in the San Diego area, including the SBIWTP. To meet CWA standards, wastewater discharged from the SBIWTP must undergo primary and secondary treatment.

According to the USIBWC, from 1991 to 1994, Congress appropriated \$239.4 million to the EPA for (1) a wastewater treatment facility that would provide both primary and secondary treatment capacity, (2) a facility called the South Bay Ocean Outfall (SBOO) to carry the treated effluent from the plant out into the Pacific Ocean for disposal, and (3) related facilities.<sup>6</sup> The EPA distributed these funds to the USIBWC to plan, design, and construct the SBIWTP; to the City of San Diego to construct the SBOO; and to the U.S. Army Corps of Engineers to provide planning and environmental review assistance. EPA's appropriations act for fiscal year 1993 capped funding for this project at \$239.4 million.<sup>7</sup>

A primary treatment facility and related infrastructure was constructed for about \$133 million, the SBOO was constructed for about \$90 million, and the SBIWTP began operating in 1997. However, the part of the SBIWTP that would have provided secondary treatment was never constructed because nearly all of the appropriated funds had been spent on constructing the other facilities. As a result, effluent that does not comply with CWA standards continues to flow into the U.S. waters of the Pacific Ocean, and the SBIWTP has never been in compliance with the terms of its NPDES permit. Figure 1 shows the location of the SBIWTP and other existing and proposed wastewater treatment facilities in the Tijuana border region.

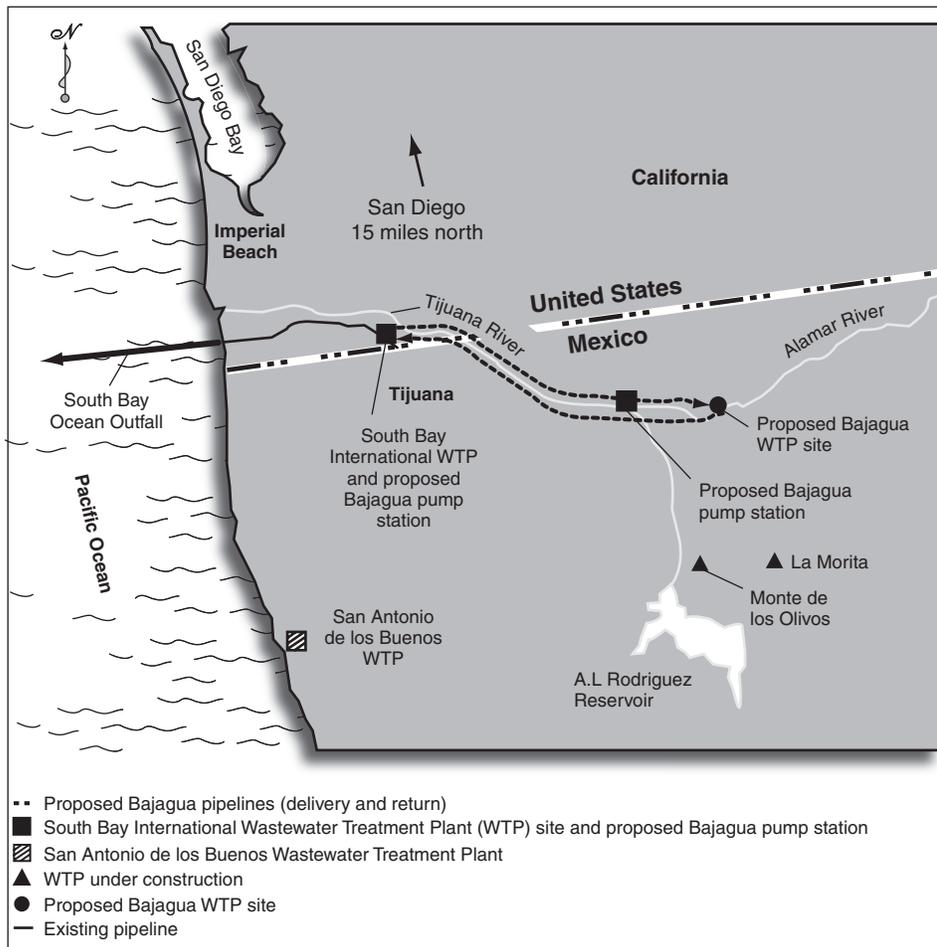
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<sup>5</sup>The permit includes limits on the amount of pollution that can be discharged as well as monitoring requirements to ensure, among other things, that water quality levels are maintained.

<sup>6</sup>United States Section, International Boundary and Water Commission, *Final Supplemental Environmental Impact Statement, Clean Water Act Compliance at the South Bay International Wastewater Treatment Plant* (Pasadena, CA, 2005).

<sup>7</sup>Pub. L. No. 102-389, 106 Stat. 1599 (1992).

**Figure 1: Location of Existing and Proposed Border Wastewater Treatment Facilities**



Source: GAO analysis of data provided by U.S. Section, IBWC, and Bajagua, LLC.

Over the years, the USIBWC has considered several options for bringing the SBIWTP into compliance with the CWA. Under the National Environmental Policy Act of 1969 (NEPA), agencies evaluate the likely environmental effects of projects they are proposing using an environmental assessment (EA) or, if the projects likely would significantly affect the environment, a more detailed environmental impact statement (EIS). Over the past 14 years, the USIBWC prepared three separate EISs—in 1994, 1999, and 2005—considering different alternatives for achieving CWA compliance at the SBIWTP.

In 1994, as part of the original SBIWTP design process, the USIBWC and EPA evaluated various options for secondary treatment and concluded that activated sludge treatment—using aerobic micro-organisms to produce disposable wastewater and residual solids—was its preferred option for meeting CWA effluent standards. However, the infrastructure needed to provide this treatment was never constructed in part because the adequacy of the NEPA analysis for the 1994 decision was challenged in court. The USIBWC and EPA resolved the litigation by agreeing to re-examine the secondary treatment alternatives. In 1999, the USIBWC

## Enclosure II

and EPA again reviewed its options and concluded that aerated pond treatment was its preferred alternative for secondary treatment because the USIBWC believed this was the most timely and cost-effective option.<sup>8</sup> However, Congress declined the USIBWC's and EPA's requests for funding and, in November 2000, passed the Tijuana River Valley Estuary and Beach Sewage Cleanup Act, authorizing the secondary treatment of wastewater from the SBIWTP at a new facility to be built in Mexico.<sup>9</sup> The Act authorized the USIBWC to enter into a multiyear fee-for-services contract with the owner of the Mexican facility and to negotiate a new treaty minute to implement the Act's provisions. The Act's provisions closely paralleled the proposal of a private company, Bajagua, LLC, to carry out secondary treatment in Mexico under a fee-for-services agreement.

In 2001, the Regional Water Quality Control Board of San Diego sued the USIBWC seeking to compel it to begin complying with the CWA, the Porter-Cologne Act, and the terms of the NPDES permit. In December 2004, the U.S. District Court for the Southern District of California issued an order that established milestones to lead the USIBWC to comply with the CWA by September 30, 2008.

In February 2004, the United States and Mexico Sections of the IBWC agreed to a new international agreement known as a treaty minute, Minute 311, to implement the Tijuana River Act. Under Minute 311, the commission could enter into an "operating lease contract" with Bajagua, LLC as the service provider of the Mexican facility. Minute 311 provided that the arrangement would be subject to the approval of the U.S. and Mexican governments in a subsequent treaty minute.<sup>10</sup>

In 2005, the USIBWC once more evaluated its options and concluded that funding was not available at that time to construct a secondary treatment option at the U.S. facility. Therefore its preferred option was to pump wastewater that had undergone primary treatment at the SBIWTP to a plant to be built in Mexico, where it would receive secondary treatment using an extended aeration process. The plant would be built and operated by Bajagua, LLC and paid for by a fee-for-services agreement. According to a 2005 document explaining the USIBWC's decision, Bajagua, LLC was chosen in part because the USIBWC believed that Bajagua, LLC could meet the deadlines in the court order and because funding was not available at that time to upgrade the U.S. facility. However, the USIBWC suspended its development agreement with Bajagua, LLC on May 8, 2007, after Bajagua, LLC informed the USIBWC that it would not be able to meet the court-ordered deadline.<sup>11</sup> The 2008 Consolidated Appropriations Act, signed by the President on December 26, 2007, included language requiring the USIBWC to

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<sup>8</sup>Aerated ponds treat organic wastes using natural bacteria.

<sup>9</sup>Pub. L. No. 106-457, Title VIII.

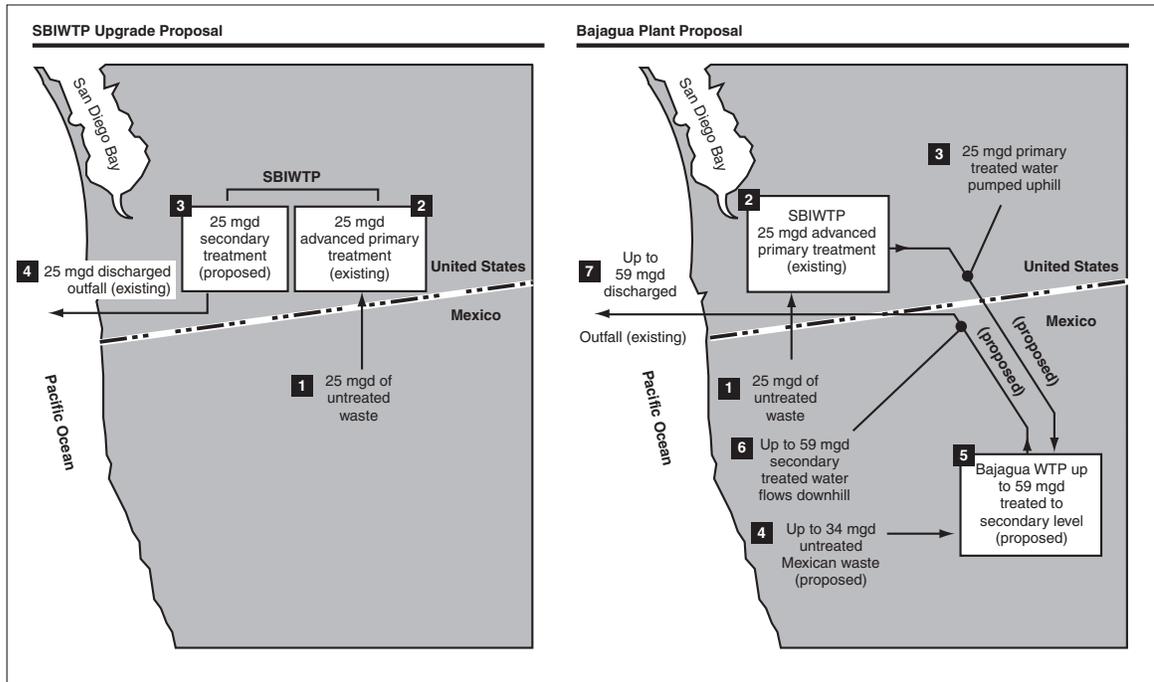
<sup>10</sup>Minute 311 further provides that if "agreement on an operating lease arrangement or design that is acceptable to both governments is not reached, the stipulations established in [the 1990 treaty minute] will apply." The 1990 treaty minute included the original conceptual plan for building the SBIWTP to secondary treatment capacity.

<sup>11</sup>The development agreement gives Bajagua, LLC exclusive rights to develop the Mexican facility.

Enclosure II

resume negotiations with Bajagua, LLC and to prepare plans to upgrade the SBIWTP. Consequently, the USIBWC is currently considering two proposals: (1) upgrading the SBIWTP to provide secondary treatment at the existing plant site, or (2) building a new plant in Mexico and pumping wastewater that received primary treatment at the SBIWTP to the new plant for secondary treatment, as proposed by Bajagua, LLC. Figure 2 shows the wastewater flows for the two proposals.

**Figure 2: Diagram of Wastewater Flows for the Alternative Proposals**



Source: GAO analysis of data provided by U.S. Section, IBWC, and Bajagua, LLC.

**Slides from April 7, 2008, Briefing to Congressional Staff**



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# **International Boundary and Water Commission**

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**A Briefing for Congressional Requesters on  
Two Alternatives for Improving Wastewater  
Treatment at the United States-Mexico Border  
April 7, 2008**

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## The Problem

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- For many years untreated sewage flows entered the United States from Tijuana, Mexico, largely via the Tijuana River. Tijuana's sewage system does not have the capacity to treat all of the city's wastewater, and its higher elevation resulted in sewage flowing downhill into California.
  - The untreated wastewater polluted the Tijuana River estuary and discharged into the Pacific Ocean, causing beach closures on the California coast south of San Diego.
  - In the 1990s, the U.S. and Mexican Sections of the International Boundary and Water Commission and the U.S. Environmental Protection Agency (EPA) addressed the problem by building the South Bay International Wastewater Treatment Plant (SBIWTP) in San Ysidro, California.
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## The Problem (cont'd)

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- To meet Clean Water Act (CWA) standards, wastewater from the plant must receive primary and secondary treatment before it can be discharged.
  - The SBIWTP began operations in 1997, providing advanced primary treatment to 25 million gallons per day (mgd) of wastewater from Tijuana. The part of the facility that was to provide secondary treatment was never constructed because of legal challenges and a lack of funding.
  - As a result, water discharged from the SBIWTP via the South Bay Ocean Outfall (SBOO) into U.S. waters of the Pacific Ocean is only partially treated and has never met CWA standards.
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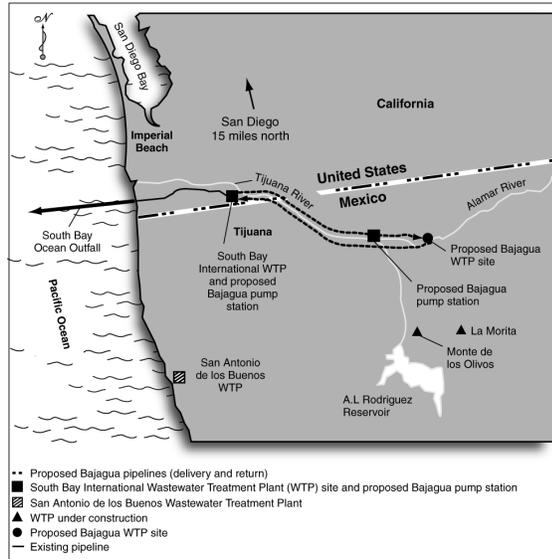
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## USIBWC Currently Is Considering Two Proposals

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- The U.S. Section of the International Boundary and Water Commission (USIBWC) has considered several options over the years to solve the problem, and is currently under a federal court order to comply with the CWA by September 30, 2008.
  - The USIBWC is considering two alternatives:
    1. Upgrading the SBIWTP to provide secondary treatment at the existing plant site, or
    2. Building a new plant in Tijuana, Mexico, and pumping wastewater from the SBIWTP to the new facility for secondary treatment, as proposed by Bajagua, LLC.
  - Under both proposals, treated wastewater would be discharged into the ocean via the existing SBOO.
  - Neither proposal addresses wastewater flows outside of the Tijuana sewage system.
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## USIBWC Currently Is Considering Two Proposals (cont'd)



Source: GAO analysis of data provided by U.S. Section, IBWC, and Bajagua, LLC.



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## Objectives

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- In response to an explanatory statement that accompanied the 2008 Consolidated Appropriations Act, GAO
    1. described the two proposed treatment alternatives,
    2. described the estimated costs and timelines for each proposal, and
    3. assessed the reliability of the cost and timeline estimates.
  - The explanatory statement directed GAO to report to the Appropriations Committees within 120 days of enactment of the law, which occurred on December 26, 2007.
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## Scope and Methodology

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- To describe the proposals, their costs, and timelines, we
    - obtained project descriptions and cost and completion timeline estimates from the USIBWC for the SBIWTP upgrade and Bajagua, LLC for the plant in Mexico; and
    - interviewed representatives of the USIBWC, Bajagua, LLC, EPA, regional water quality control boards, and other stakeholders.
  - We also visited the SBIWTP, existing and under-construction treatment plants in Tijuana, and the proposed site for the Bajagua plant.
  - We conducted this performance audit from January 2008 to April 2008 in accordance with generally accepted government auditing standards.
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## Limitations of GAO's Work

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- The USIBWC and Bajagua, LLC did not provide current and complete cost and timeline estimates until the latter half of March, limiting the time available for assessing their reliability.
  - We did not independently verify these cost or timeline estimates.
  - We limited our review to the objectives discussed with the staffs of the House and Senate Appropriations Committees. As a result, we did not assess a number of related issues, such as the potential benefits of the proposals.
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## The Alternatives: In Summary

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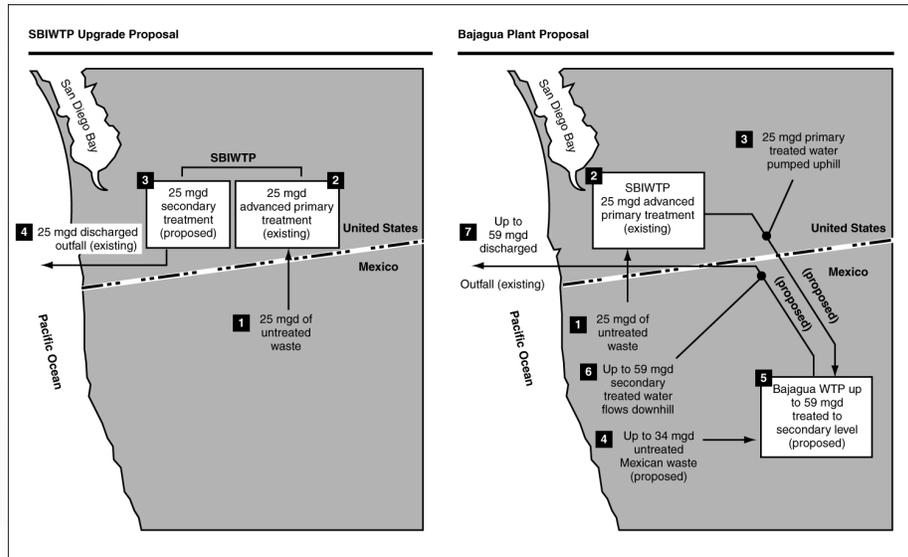
- Both plants would address the current need to provide secondary treatment to 25 mgd of Mexican wastewater, but would do so with different contracting and funding approaches.
  - The Bajagua, LLC proposal is more logistically complex due in part to the movement of wastewater back and forth across the border for primary and secondary treatment.
  - The larger treatment capacity of the Bajagua plant could help address Tijuana's future needs, but estimates vary regarding when this additional capacity may be needed.
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## The Alternatives: Three Key Differences In Approaches

	<b>SBIWTP Upgrade</b>	<b>Bajagua Plant</b>
Amount treated	Would provide secondary treatment for 25 mgd of wastewater.	Would provide secondary treatment for 25 mgd of wastewater and the capacity to treat up to 34 mgd of additional wastewater from Tijuana.
Design, construction, and operation	USIBWC would request separate bids to (1) construct the upgrade based on USIBWC's final design and (2) operate the plant when completed.	Bajagua, LLC would enter into a fixed price contract with a single contractor to design, build, and operate (DBO contractor) the plant.
Funding	U.S. appropriations would fund construction and operations and maintenance (O&M) costs.	Bajagua, LLC would finance cost of construction. U.S. appropriations would pay for wastewater treatment services over 20 years enabling Bajagua, LLC to recover the cost of construction and pay for O&M costs, management fees, and profits.

# The Alternatives: Differences in Wastewater Flows for Each Alternative



Source: GAO analysis of data provided by U.S. Section, IBWC, and Bajagua, LLC.



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## **The Alternatives: Estimates Vary on When Bajagua's Extra Capacity May Be Needed**

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- A 2003 report by the State Commission of Public Services of Tijuana (CESPT) and EPA projected that Tijuana would need an additional 34 mgd of wastewater treatment capacity by 2023.
  - A February 2008 updated analysis, also conducted by CESPT and EPA, found that Tijuana will need no additional treatment capacity until at least 2015, but could need about 17 mgd of additional capacity by 2025.
  - In a March 27, 2008 letter to the Commissioner of the Mexican Section of the IBWC, CESPT independently updated its estimate, identifying 12 mgd of additional treatment capacity needed in 2010, and 34 mgd needed by 2019.
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## Costs and Timelines: In Summary

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- According to USIBWC and Bajagua, LLC estimates for their respective proposals,
    - the SBIWTP upgrade would cost less to construct and less to operate on an annual basis as well as over a 20-year operating period.
    - the Bajagua plant would be operational about 10 months before the SBIWTP upgrade would be operational.
  - Neither proposal's estimated completion date meets the court order to meet CWA standards by September 30, 2008.
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## **Costs and Timelines: SBIWTP Upgrade Costs Less Than Bajagua Plant to Build and Operate**

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- USIBWC estimates the U.S. federal government's cost to upgrade the SBIWTP to 25 mgd of secondary treatment capacity is \$101.5 million in 2008 dollars.
- Total O&M costs for both the primary and secondary treatment facilities will initially (first year) cost \$16.7 million in 2008 dollars.
  - Total O&M costs include \$8.4 million for primary and \$8.3 million for secondary treatment.



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## **Costs and Timelines: SBIWTP Upgrade Costs Less Than Bajagua Plant (cont'd)**

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- Bajagua, LLC estimates that it will cost \$195.6 million in 2008 dollars to construct a plant with secondary treatment capacity of 59 mgd.
  - Wastewater treatment services, including O&M costs (which include primary treatment at SBIWTP), equity and debt service, management fees, and profit, will initially cost the U.S. federal government \$33.8 million, in 2008 dollars.
  - Bajagua, LLC's estimate is based on treatment of 34.6 mgd in the first year of operation. This includes 25 mgd of wastewater it will receive from the SBIWTP and 9.6 mgd it expects to receive from the Tijuana sewer system.
  - As treatment needs increase over time, as Bajagua, LLC expects them to, costs to the U.S. federal government will also increase.
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## **Costs and Timelines: SBIWTP Upgrade's Total 20-year Cost Is Less Than Bajagua Plant's**

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- The estimated cost to the U.S. federal government for construction and operation over a 20-year term is
    - about \$331 million for the SBIWTP upgrade, and
    - about \$539 million for the Bajagua plant.
  - Both estimates are for the present value in 2008.
  - Both estimates include the costs of providing primary and secondary treatment. This means that both estimates include the O&M costs for primary treatment at the SBIWTP (\$121 million).
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## **Costs and Timelines: Other Cost Considerations**

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- If Bajagua, LLC develops the capability to reclaim water from its plant, it has proposed that future U.S. federal government costs could be reduced by sharing in revenues from the sale of such reclaimed water.
  - After 20 years, Bajagua plant ownership would transfer to Mexican authorities, and the U.S. federal government's service fee obligation to Bajagua, LLC would end.
  - SBIWTP O&M costs would continue as an obligation of the federal government indefinitely, as would O&M costs for pumping primary treated water to the Bajagua plant if it is built.
  - USIBWC is currently initiating negotiations with Mexico to increase the share of SBIWTP O&M costs paid by Mexico.
-



## Costs and Timelines: USIBWC Estimates the SBIWTP Upgrade Will Be Operating Jan. 2011

Activity	2008												2009												2010												2011		
	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M
Design																																							
Permits and Approvals																																							
Procurement (Construction)																																							
Construction																																							
Procurement (Operations)																																							
Testing																																							



## Costs and Timelines: USIBWC's Assumptions for Beginning Operations in Jan. 2011

Activity	Estimated Duration	Plans/Assumptions
Design	5 months	Engineering firm S&B Infrastructure is updating the original design for USIBWC, to be completed by June 24, 2008.
Permits and Approvals	9 months	USIBWC estimates it will develop and issue a revised record of decision explaining its rationale for selecting the SBIWTP upgrade alternative in 3 months, and it will take an additional 6 months to receive two permits.
Procurement (Construction)	6.5 months	Time includes 1.5 months to prepare the solicitation, 3 months of bidding, and 2 months to award and issue notice to proceed. The construction contract will be awarded through sealed bidding. Ability to award contract assumes that Congress provides sufficient funding at beginning of FY 2009.
Construction	24 months	S&B Infrastructure estimates construction will take 18-24 months.
Procurement (Operations)	9 months	USIBWC's estimate is based on its last solicitation for the SBIWTP O&M contract. O&M contract will be a negotiated procurement.
Testing	1 month	S&B Infrastructure estimates testing will take a month.





## Costs and Timelines: Bajagua’s Assumptions for Beginning Operations in March 2010

Activity	Estimated Duration	Plans/Assumptions
Design	17 months	Current design is conceptual. In line with typical DBO contracts, contractor will complete design during procurement and construction phase.
Permits and Approvals	27 months	Bajagua, LLC and its DBO contractor would be required to obtain over 30 permits, environmental approvals, and concessions from both U.S. and Mexican authorities during this period.
Procurement	5 months, 1 week	Procurement phase includes the time from USIBWC review of the request for proposal to signing the DBO contract.
Construction	18 months	Construction will begin after procurement. Engineering firm RW Beck made the estimate and the three firms that passed the request for qualifications (RFQ) stage confirmed it.
Testing	1 month	RW Beck made the estimate and the three firms that passed the RFQ stage confirmed it.



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## Reliability Assessment: In Summary

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- Neither project's cost and timeline estimates fully meets GAO's criteria for reliability.
  - The SBIWTP upgrade's cost estimate meets GAO's criteria to a greater extent than the Bajagua plant's cost estimate, which may make it somewhat more reliable than the Bajagua plant's estimate.
  - Neither timeline estimate meets GAO's criteria, although the greater number of uncertainties related to Bajagua, LLC's timeline reflects more potential risk in that schedule.



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## Reliability Assessment: Criteria for Assessing the Cost Estimates

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- Certain best practices should be followed to develop accurate and credible cost estimates.
  - Best practices represent established, repeatable methods that result in quality estimates that can be easily and clearly traced, replicated, and updated.
- We conducted our analysis of cost estimates using GAO's Cost Assessment Guide (GAO-07-1134SP), which considers an estimate to be reliable if it is:
  - well documented,
  - comprehensive,
  - accurate, and
  - credible.



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## Reliability Assessment: SBIWTP Estimate Is Better Documented Than Bajagua's

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- While neither project's cost estimate fully meets GAO's criteria for being well documented, the SBIWTP upgrade estimate meets more of the best practices than the Bajagua estimate.
- The SBIWTP upgrade cost estimate largely meets GAO's documentation criteria. Specifically,
  - its purpose is clear, assumptions are well-defined and have been reviewed and approved by USIBWC technical staff, and it includes a technical baseline that comprehensively describes the project in detail;
  - the source data and methodologies for calculating the point cost estimate are clearly stated, which lends itself to replication;
  - the estimate did not provide for full traceability to source data (e.g., price quotes for materials) or always provide the rationale for using a particular methodology or source.



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## Reliability Assessment: SBIWTP Estimate Is Better Documented Than Bajagua's (cont'd)

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- The Bajagua plant cost estimate partially meets GAO's documentation criteria. Specifically,
  - its purpose is clear, the assumptions are generally defined, and it has been reviewed and approved by Bajagua, LLC's management;
  - the preliminary technical baseline describing the project is not detailed or comprehensive, in keeping with the DBO approach;
  - source data and methodologies for calculating the point cost estimate are only described in general terms, making replication potentially difficult; and
  - the estimate did not provide for full traceability to source data, or always provide the rationale for using a particular methodology or source.



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## Reliability Assessment: SBIWTP's Estimate Is More Comprehensive Than Bajagua's

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- While neither project's cost estimate fully meets GAO's comprehensiveness criteria, the SBIWTP upgrade estimate provides greater detail on more project elements than the Bajagua estimate.
  - The SBIWTP upgrade cost estimate partially meets GAO's comprehensiveness criteria. Specifically, it includes
    - a work breakdown structure defining in detail the work needed to produce specific elements of the project down to four levels of cost, and
    - a detailed description of resources and processes needed to produce each component of the project, including the largest budget items that most impact total cost.
  - We found estimates for high-level costs common to all project elements, but not for more detailed level costs, such as testing or procurement.
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## **Reliability Assessment: SBIWTP's Estimate Is More Comprehensive Than Bajagua's (cont'd)**

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- The Bajagua plant cost estimate partially meets GAO's comprehensiveness criteria. Specifically, it includes
  - a work breakdown structure generally defining the work needed to produce specific elements of the project down to three levels of cost, and
  - a general description of the resources and processes needed to produce each component of the project, but did not specify the largest budget items that most impact total cost.
- We found estimates for many costs common to all project elements, such as procurement and construction management.



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## Reliability Assessment: Both Cost Estimates Partially Met GAO's Accuracy Criteria

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- Neither project's cost estimate fully meets GAO's accuracy criteria, but both have taken steps to validate the reasonableness of their updated estimates.
  - For the SBIWTP upgrade cost estimate:
    - a consulting engineering firm checked the original design estimate for errors, made corrections, cross-checked the biggest budget items, and used the build-up method which identifies detailed level costs and rolls the costs up to higher levels to produce a new total cost point estimate.
  - For the Bajagua plant cost estimate:
    - the consulting engineering firm that developed the preliminary plant design revised the estimate to reflect the current design status, updated costs to reflect current prices and rates, and used the build-up method to produce a new total cost point estimate.
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## **Reliability Assessment: Both Cost Estimates Met Little of GAO's Credibility Criteria**

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- Neither project's cost estimate meets GAO's credibility criteria.
  
  - The cost estimates for both projects have not
    - been independently reviewed and verified to determine if other estimating methods would produce similar results;
    - varied major assumptions to determine how sensitive outcomes are to changes in the assumptions; and
    - conducted risk and uncertainty analyses to determine the level of risk and the extent to which the actual costs may vary from the point estimate.
  
  - Both estimates included a contingency factor for uncertainty (10% for Bajagua and 15% for SBIWTP upgrade) but neither described how or why this amount was selected.
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## Reliability Assessment: Best Practices for Assessing the Timeline Estimates

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GAO's Cost Assessment Guide (GAO-07-1134SP) includes a set of best practices for scheduling that focus on constructing an integrated network schedule, necessary components of which include that:

- all activities are defined and sequenced, and the duration for each activity is estimated;
  - resources (e.g., labor, material, and overhead) are assigned to all activities;
  - the critical path is identified for all activities;
  - float time—the amount of time a task can slip before affecting the critical path—between activities is identified;
  - schedule risk analysis is conducted using statistical methods to determine the amount of time to reserve for contingencies; and
  - the schedule is horizontally integrated (depicts relationships between different program tasks and resources needed for different tasks) and vertically integrated (traces the consistency of data between master-, intermediate-, and detailed-level tasks in the schedule).
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## **Reliability Assessment: Neither Project's Timeline Fully Meets GAO's Criteria**

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- While both projects have timeline estimates based on the previous experience of their engineering contractors, neither project's timeline estimate fully meets any of the scheduling best practices.
- Since a construction contractor has not yet been assigned to either project, neither project has yet developed an integrated network schedule, which would promote efficiency and accuracy in program scheduling.
- Although it is early in the project development stage for both projects, completing a schedule risk analysis to determine the level of uncertainty related to different program elements would be critical in assessing the reliability of the projects' timeline estimates.



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## **Reliability Assessment: Bajagua Plant Timeline Includes Greater Uncertainties**

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- Since neither project has conducted a schedule risk analysis, GAO identified some of the potential risks facing each project that would typically go into such an analysis.
- GAO found that there are a greater number of uncertainties associated with the Bajagua plant that could affect schedule and cost.



## Reliability Assessment: Uncertainties That May Delay the SBIWTP Upgrade Timeline

Areas of Uncertainty	Potential Impact
USIBWC may not receive funding at the beginning of the fiscal year.	May delay contract award date and, subsequently, completion dates.
USIBWC may not receive sufficient funding.	USIBWC could not complete upgrade with current appropriations of \$66 million.
Lawsuit may seek to force USIBWC to prepare new Environmental Impact Statement	Delays upgrade if court issues injunction, which will depend in part on whether there is significant new environmental information needing analysis.



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## Reliability Assessment: Uncertainties That May Delay the Bajagua Plant's Overall Timeline

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Areas of Uncertainty	Potential Impact
Over 30 permits, environmental approvals, and concessions from both U.S. and Mexican authorities are needed both for construction and operations.	Delay in any of these items would cause the timeline to be put on hold until the necessary permit, approval, or concession could be obtained.



## Reliability Assessment: Uncertainties That May Delay the Bajagua Plant’s Start of Procurement

Areas of Uncertainty	Potential Impact
<p>According to EPA, the National Environmental Policy Act (NEPA) requires a review of the Bajagua plant’s new site location before the start of procurement.</p>	<p>Review would take a minimum of 1 month and could take more than a year if the site is an endangered species habitat.</p>
<p>The Binational Technical Committee which advises the IBWC is concerned about the availability and location of the 34 mgd of additional sewage flows.</p>	<p>Procurement could be delayed until the issues are resolved.</p>



## Reliability Assessment: Uncertainties That May Delay the Bajagua Plant’s Start of Construction

Areas of Uncertainty	Potential Impact
U.S. and Mexican Sections of the IBWC must negotiate a Minute (implementation agreement) before construction can begin.	USIBWC officials estimate that negotiation will take approximately 13 months from the date of issuance of this GAO report, which could delay construction by about 9 months.
USIBWC has concerns about the draft of its fee-for-services agreement with Bajagua, LLC, which must be signed before Bajagua, LLC could sign a DBO contract.	USIBWC hopes issues can be resolved before the DBO contract is ready, otherwise construction would be delayed for an unknown period until the issues are resolved.
The location of proposed pipelines to and from the Bajagua plant along the Tijuana River flood control channel.	The pipeline design details may delay approval of the right-of-way issuance by Mexico if Mexico thinks the pipeline installation may pose a problem for flood control, vehicular access, or traffic.



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## Reliability Assessment: Uncertainties That May Delay the Bajagua Plant's Start of Operations

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Areas of Uncertainty	Potential Impact
Bajagua, LLC's pending application for CWA permit and the need for USIBWC to be named on the permit.	Failure to resolve this issue could delay or prevent Bajagua plant operation.

Comments from the USIBWC

Note: GAO comments supplementing those in the report text appear at the end of this enclosure.



OFFICE OF THE COMMISSIONER  
UNITED STATES SECTION

INTERNATIONAL BOUNDARY AND WATER COMMISSION  
UNITED STATES AND MEXICO

April 16, 2008

Mr. David C. Maurer  
Acting Director, Natural Resources and Environment  
Government Accountability Office  
441 G St., NW  
Washington, D.C. 20548

Dear Mr. Maurer;

I would like to extend my appreciation to the Government Accountability Office for your work evaluating alternatives for secondary treatment at the South Bay International Wastewater Treatment Plant (SBIWTP). The following comments are offered by USIBWC on the draft report we received from you on April 8, 2008, and we look forward to receiving the final report. The USIBWC generally agrees with GAO's findings, conclusions and recommendations given the limited scope and timeframe for the review of the two alternatives. I would also like to emphasize that the alternative for completing secondary in the United States is viewed as a more efficient and less expensive solution to bringing the SBIWTP into Clean Water Act compliance as demonstrated by the funding for this project in the FY 2008 Appropriations Act.

See comment 1.

Page 1, first sentence – Transboundary flows in canyons should be noted; not all flow into the U.S. enters via the Tijuana River.

See comment 1.

Page 1, second sentence - Note there are unsewered areas in Tijuana in addition to lack of wastewater treatment capacity.

See comment 1.

Page 1, third Sentence - Identify the U.S. Environmental Protection Agency as a collaborator with the U.S. and Mexican Sections of the IBWC in constructing the SBIWTP.

See comment 1.

Page 1, second paragraph, first sentence and throughout document - The abbreviation for the United States Section, International Boundary and Water Commission, United States and Mexico is USIBWC. IBWC is the abbreviation for the Commission as a whole, which includes both U.S. and Mexican Sections.

Page 5, first paragraph – Regarding the statement that the Bajagua project will cost the U.S. federal government \$32.2 million during the first year of operation and would be about \$516 million in 2008 dollars, the USIBWC questions the reliability of this estimate unless Bajagua has some data to substantiate this assertion. The Development Agreement entered into between the USIBWC and Bajagua identified a cost range of between \$29-39 million dollars, which represented +/- 15% of \$34.5 million. This figure was based on a construction cost of \$178 million. Bajagua is now estimating a construction cost of \$195.6 million. The reduced annual cost appears low in light of the

The Commons, Building C, Suite 310 • 4171 N. Mesa Street • El Paso, Texas 79902  
(915) 832-4100 • (FAX) (915) 832-4190 • <http://www.ibwc.state.gov>

fact that the capital cost has increased above the amount anticipated in the Development Agreement. USIBWC also comments that there is not certainty on the cost of the Bajagua project until after the Request for Proposals is issued and a Design Build Operate contract is awarded for the project.

Page 5, first paragraph - USIBWC disagrees that the Bajagua project could be completed by March 2010. USIBWC internal analysis, including consideration of needed binational agreements, including a new IBWC Minute, and the general complexity and novelty of the project indicates at the very best, a similar time frame to the SBIWTP secondary upgrade.

See comment 2.

Page 12 The location maps here and on page 15 should have a scale.

See comment 1.

Page 13, second paragraph – It is important to note that both USIBWC and EPA collaborated in NEPA document preparation and evaluation of treatment options. The 1994 lawsuit involved NEPA compliance for the plant. The treatment technology was not the subject of litigation but rather litigants challenged the NEPA documentation for failure to examine sufficient alternatives. Congress declined both the USIBWC and EPA’s requests for funding. In the discussion of the 1999 ROD, it should be noted that EPA was a cooperating agency and that it was indeed EPA who believed that ponds were the most timely and cost-effective option, considering the remaining funding available to EPA. USIBWC concurred since it was EPA that was the funding stream for the project; USIBWC always believed that from an engineering standpoint activated sludge was the more proven and better technology.

See comment 1.

Page 14 Substitute “an extended aeration process” for “aerated ponds”. Also, change “using oxygen and microorganisms to break down sewage into a disposable sludge” to “the use of aerobic microorganisms in a biological floc to reduce the organic content of sewage. The end products of the activated sludge process include wastewater of acceptable quality for discharge and a residual biosolid requiring further stabilization and treatment.”

Power Point Presentation Slides

See comment 1.

Slide 10 It should be noted that the SBIWTP upgrade has the capacity for expansion up to 100 mgd. Clarify that one contractor will operate the SBIWTP, both advanced primary and secondary facilities. On the funding section, we should note that U.S. appropriations would fund the U.S. share of construction and operations and maintenance costs and that Mexico will continue to cost-share the O&M. Indicate that we are initiating negotiations with Mexico to increase their cost-share.

Slide 12 The USIBWC has not been provided data to substantiate the CESPT assertion that an additional 12 mgd capacity is needed in 2010; unless CESPT is planning to reduce sewage flows currently going to existing Mexican facilities.

See comment 1.

Slide 13 Please delete reference to IBWC on the timeframe estimate for the Bajagua project. USIBWC does not believe the Bajagua Project can be completed 10 months earlier than the SBIWTP upgrade.

Enclosure IV

See comment 1.

Slide 14 Cost for advanced primary operations and maintenance should be revised to \$8.4 million and cost for secondary to \$8.3 million, 2008 dollars. USIBWC current cost for O&M contract for the plant is \$6.8 million, however the cost of water, electricity and SDG&E fees is \$1.6 million.

See comment 3.

Slide 15 Third bullet – Is there any basis for the 9.6 mgd additional capacity above 25 mgd proposed in the first year of operation? CESPT identified 12 mgd deficiency in 2010, not 9.6 mgd.

See comment 4.

Slide 17 Third bullet--Note that Mexican financial obligations for IBWC treatment facilities at Nuevo Laredo and Nogales have been less than optimum. USIBWC expects that there will be ongoing U.S. Government cost participation after 20 years with the Bajagua Project because in the past Mexico has not developed the financial capacity to become self sufficient. In addition to the continued U.S. Government funding of the SBIWTP O&M costs, it should be noted that the U.S. Government would likely also be indefinitely supplementing the funding of the cost of pumping the advanced primary effluent from the SBIWTP to the Bajagua plant, since that pump station is in the U.S. and will receive power from a U.S. utility.

See comment 5.

Slide 21 Clarify that the duration for permits and approvals stretches over the entire procurement process. Delays in any of these could delay construction. Also, verify that design will be conducted up to a point 5 months before construction is completed. I am assuming that the schedule reflects the DBO proposals submitted before construction begins as part of "design".

Slide 36 A significant area of uncertainty includes negotiation of a new Minute by the U.S. and Mexican Sections of the IBWC, which will constitute final binational approval of the project design parameters and fee-for-services contract. In addition the Minute must be approved by both the U.S. and Mexican Governments before it can enter into force.

Thanks for the opportunity to review the draft and provide comments. If you need any additional information, please call me at 915-832-4157 or Mr. Steve Smullen at 619-662-7600.

Sincerely,  
  
Carlos Marin, P.E.  
Commissioner

**GAO Evaluation**

1. Except where noted otherwise below, we made changes to the draft report in response to USIBWC's technical comments as appropriate.
2. The purpose of the maps in enclosure II, pages 12 and 14 of our report, is to identify the general locations of the existing and proposed border wastewater treatment facilities. They are not necessarily drawn to scale.
3. As the report indicates in enclosure III, page 29, 9.6 mgd of additional wastewater is Bajagua, LLC's estimate of the amount of wastewater it expects to receive from the Tijuana sewer system in its first year of operation. We did not independently assess Tijuana's current or future wastewater treatment needs.
4. The USIBWC notes that it expects that there will be ongoing U.S. federal government cost participation in the proposed Bajagua plant after 20 years. Our report does not say that all costs to the U.S. government would end after 20 years. Rather, in enclosure III, page 31, we said that the U.S. government's service fee obligation to Bajagua, LLC would end at that time. In addition, we indicated that the O&M costs for the SBIWTP would continue indefinitely, including O&M costs for pumping primary treated water to the Bajagua plant, if it is built.
5. Enclosure III, page 34, of the report shows that, according to Bajagua, LLC, its estimated time for obtaining permits and approvals extends over the entire procurement process and that design activities will be conducted up to a point 5 months before construction is completed.

Comments from Bajagua, LLC

Note: GAO comments supplementing those in the report text appear at the end of this enclosure.



April 16, 2008

Mr. Steve Secrist  
Assistant Director  
Natural Resources & Environment  
Government Accounting Office  
301 Howard Street, Suite 1200  
San Francisco, CA 94105

Re: Comments on GAO's Draft Report "International Boundary and Water Commission: Two Alternatives for Improving Wastewater Treatment at the United States/Mexico Border"

Dear Mr. Secrist:

Bajagua, LLC, respectfully provides the following comments on the draft GAO Report (Draft Report) referenced above. Bajagua appreciates the efforts of the GAO in preparing the Draft Report, but believes that any project-to-project comparison of the Bajagua Project and the upgrade of the International Wastewater Treatment Plant (IWTP) should conclude that the Bajagua Project is a more timely and cost-effective manner for the IBWC to comply with its Clean Water Act permit. In fact, the GAO Report does conclude that the Bajagua Project could be constructed 10 months sooner than the IWTP upgrade. For that reason alone, the Bajagua Project should be selected to address the border sewage problem.

While the Draft Report focused on timely and cost-effective compliance with the Clean Water Act, Congress also directed the GAO to continue its comprehensive review of the two projects. This directive is important because the Bajagua Project's ability to treat additional sewage, to provide recycled water to supplement diminishing supplies of water in the border region, and to manage wastewater treatment sludge in compliance with the Clean Water Act discharge permit make the Bajagua Project an even more-compelling choice. These benefits of the Bajagua Project were excluded from consideration in the Draft Report, but they are critical to any comprehensive review.

The facts are clear. Not only would it take longer to upgrade the IWTP than to construct the Bajagua Project, but the cost per unit of treated water for the IWTP would be more expensive, the IWTP upgrade would not produce any recycled water, and the IWTP upgrade would not treat any additional untreated sewage. In addition, the Draft Report does not include the costs to the IBWC of properly managing the sewage sludge currently generated at the IWTP in accordance with its Clean Water Act permit, a cost that will increase if the IWTP is upgraded.

160 Industrial St. Suite 200 San Marcos, CA 92078 • Bus. 760.471.2365 • Fax 760.471.2383  
www.bajagua.com

See comment 1.

See comment 2.

See comment 1.

See comment 3.

See comment 4.

See comment 1.

See comment 5.

See comment 6.

Mr. Steve Sechrist  
April 16, 2008  
Page 2

This is another example of how the IWTP upgrade fails to address the larger environmental issue of managing the flow of untreated sewage from Tijuana into the United States.

See comment 3.

See comment 7.

See comment 8.

If the GAO takes the position that it cannot affirmatively state that the Bajagua Project would be the most-timely and cost-effective project, then the comprehensive review of the two projects directed by Congress should be completed. Further review would be appropriate because the Draft Report (1) claims there are a number of uncertainties associated with information submitted by the IBWC and Bajagua, and (2) acknowledges that the GAO did not have the time to verify some of the information submitted. Because Judge Moskowitz in the Federal District Court case has indicated that he will grant the government adequate time to make good-faith efforts to select the right project, GAO would have time to complete a full review of the two projects and to make a determination on the merits of the two projects.

However, if the GAO only intends to issue a final version of the Draft Report, there are a number of issues that it should reconsider before it issues a Final Report. An overview of these issues is provided below and in more detail in the attached comments.

**I. The Bajagua Project Is More Cost Effective Than Upgrading the IWTP.**

See comment 9.

- Because the Bajagua Project will treat 59 million gallons per day (mgd), and the upgrade of the IWTP will treat only 25 mgd, a comparison of cost effectiveness based solely on construction and operational costs for 20 years is misleading because a larger project obviously will cost more.

See comment 5.

- When comparing the unit total costs (capital and operational) of treating 1,000 gallons of sewage, the Bajagua Project has significantly lower costs than the IWTP upgrade, the Bajagua Project cost \$1.71 versus the IWTP upgrade cost \$2.39.

See comment 9.

- The Draft Report estimates the operational costs for a 20-year period, although either treatment plant will operate for longer than 20 years. Limiting the cost analysis to 20 years is misleading because, after 20 years, the Bajagua facilities will be transferred to Mexico, and the United States will not pay for operation of those facilities. Conversely, the United States will continue to pay for the operation of the upgraded IWTP. To better assess the true costs of the two projects, a 40 or 50-year time frame is appropriate.

See comment 10.

- The estimated cost in the Draft Report of operating the IWTP does not include the cost to the IBWC of properly managing sewage sludge generated at the IWTP. The sludge currently is managed in Mexico in a manner that directly impacts waters and beaches of the United States, and violates the IBWC's Clean Water Act permit. Because an upgraded IWTP would generate even more sludge, the GAO Report must include the costs of properly managing that sludge to achieve permit compliance

Mr. Steve Sechrist  
April 16, 2008  
Page 3

when it estimates operation and maintenance costs for the IWTP. The full costs of properly managing the sludge are included for the Bajagua Project.

See comment 11.

- The Draft Report does not consider the fact that the risk of cost overruns on the Bajagua Project will be borne by Bajagua, not by the United States. That is not the case with the IWTP upgrade.

See comment 12.

- The Draft Report does not consider the significant savings to the taxpayer from the sale of 52,000 acre feet per year (AFY) of reclaimed water yearly (potable water) or 66,000 AFY of secondary treated water, even though Section 804 of PL 106-457 and Treaty Minute 311 allow the United States to offset its costs with a portion of the revenue obtained from the sale of reclaimed water. The amount of this offset could be significant given that decreasing flows in the Colorado River and in other water sources make reclaimed water very valuable in the border region.

**II. The Bajagua Project Is More Timely Than the IWTP Upgrade**

See comment 2.

- The Draft Report acknowledges that the 59 mgd Bajagua Project would be completed 10 months prior to the IWTP upgrade, but it downplays this difference by stating that the Bajagua Project includes more “unresolved issues than the SBIWTP upgrade.” That conclusion is not supported by the facts.

See comment 13.

See comment 14.

- The “over 30 permits” cited by the GAO as being needed by Bajagua are mainly minor permits or approvals, many of which can be obtained after construction begins. The three selected design, build, and operate (DBO) contractors all considered the time needed to obtain these permits when they approved the construction schedule for the Bajagua Project, and Mexican legal counsel confirmed that all Mexican permits can be obtained within the period of the proposed schedule.

See comment 15.

- The federal, state, and local governments of Mexico strongly support the Bajagua Project, and the federal government has issued a 30-year concession to Bajagua for the use of federal land for the project. The Mexican federal government has indicated that it will issue other needed concessions once the Bajagua Project is approved and under construction.

See comment 16.

- Bajagua is not aware of any “significant issues” that would delay the fee-for-services agreement that cannot be resolved with the IBWC’s cooperation. The appropriations legislation directed the IBWC to resume the fee-for-services negotiations, which it unilaterally had suspended for a period of approximately one year.

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See comment 17.

- The issue of whether Bajagua needs a Clean Water Act permit to discharge from the Bajagua facilities has not been resolved, but on March 25, 2008, Judge Moskowitz indicated that if the project is delayed because the IBWC refuses to cooperate with Bajagua and the Regional Water Quality Control Board on the issuance of the permit he could direct the IBWC to “be on the permit or stop discharging.”

See comment 18.

- The Draft Report did not consider unresolved issues regarding the IWTP upgrade.
  - The IBWC allotted three months to complete the NEPA process, but the environmental group Surfrider has stated that it will sue the IBWC if it fails to reopen the NEPA process. One issue that would be raised in any NEPA action would be the management of sewage sludge in Mexico, which affects waters in the United States. It is highly unlikely that the NEPA process could be completed in three months.

See comment 19.

- IBWC’s decision to upgrade the IWTP using an activated sludge process conflicts with guidance issued by the United States Environmental Protection Agency (EPA) that activated sludge systems are not effective unless industrial discharges are controlled through a pretreatment program. Such an industrial pretreatment program is not in place in Tijuana, and therefore the effectiveness of the IWTP upgrade must be evaluated under NEPA.

See comment 10.

- Upgrading the IWTP to provide secondary treatment will generate more sludge and, exacerbate the pollution of California beaches and near shore waters. This could result in a new Clean Water Act citizens’ suit, which will cause further delays and result in additional costs.

See comment 20.

- The IBWC schedule in the Draft Report does not include the time it will take the IBWC to obtain a Consistency Determination under the Coastal Zone Management Act (CZMA) from the California Coastal Commission. For controversial projects like the IWTP upgrade, the CZMA process is time consuming and can result in project denial. A recent CZMA hearing on a toll road proposal was attended by more than 4,000 people, most of whom opposed the project. The project was rejected by the Coastal Commission.

See comment 21.

- Whereas Bajagua’s DBO contractor will be an internationally known and reputable construction company selected by a process approved by the IBWC, the contracting entities for the IWTP upgrade are not known. Given the IBWC’s failure to complete the IWTP on schedule or within budget or to comply with its permit from the inception of operations of the IWTP in 1997, the GAO must

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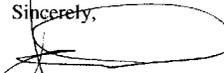
conclude that the IBWC's track record on the timeliness question presents more of an unresolved issue than any of the concerns stated for the Bajagua Project.

See comment 3.

If the 120 day final GAO Report is used to make a decision on the most timely and cost-effective project, then the Bajagua Project should be selected. However, if the GAO determines that additional study is needed to satisfy the directive of Congress to "continue its comprehensive review of the two proposed projects," Bajagua is available to assist the GAO in doing so. Again, Bajagua believes that a more-comprehensive review that addressed issues not included in the Draft Report would confirm that the Bajagua project is the best project to address border sewage issues.

While this letter presents an overview of these issues, the attached comments address GAO's specific statements in their letter to the Congressional Requesters, and in their PowerPoint briefing provided to Congressional staff. Bajagua is available to provide any additional information as requested.

Sincerely,



Jim Simmons  
Managing Member  
Bajagua, LLC

## GAO Evaluation

1. As stated on page 2 of the letter and enclosure III, page 22, we limited our work to the objectives discussed with the staff of the House and Senate Appropriations Committees and did not assess a number of related issues, including the potential benefits of the alternative wastewater treatment proposals. We assessed the reliability of the cost and timeline estimates provided by the USIBWC and Bajagua, LLC, but made no conclusions about which project would be more timely or cost-effective.
2. Our report does not conclude that the Bajagua project could be constructed 10 months sooner than the South Bay International Wastewater Treatment Plant (SBIWTP) upgrade. On page 3 of the letter we present Bajagua, LLC's estimate that its plant would be operational about 10 months before the SBIWTP upgrade, but as noted on page 2, we did not independently verify this information. We also identify, on pages 4 and 5 of the letter and enclosure III, pages 48-51, a number of uncertainties that could delay the Bajagua plant's planned start of operations.
3. Under our Congressional Protocols, when an explanatory statement directs us to report to specific committees, we work with the majority and minority staff of the designated committees to clarify the scope of work, reporting objectives, and time frames. In this case, we worked with the relevant staff of the Senate and House Appropriations Committees to arrive at the scope of work and reporting objectives described in the report on page 2. Although the explanatory statement which called for this report, accompanying the 2008 Consolidated Appropriations Act passed on December 26, 2007, makes reference to a separate on-going comprehensive GAO review, we did not have such a review on-going. We would consider conducting further work related to wastewater treatment issues in the Tijuana River basin if we received a Congressional request or mandate to do so.
4. Bajagua, LLC states that its project could provide recycled water to supplement diminishing supplies of water in the border region. However, the construction plans that Bajagua, LLC submitted to us for its proposed wastewater treatment plant did not include plans to construct facilities to treat wastewater so that it can be recycled, sold, and reused. As our report states on page 2, we did not assess whether Bajagua, LLC could develop the capacity to reclaim water from its project at some point in the future.
5. Bajagua, LLC states that the cost per unit of treated wastewater for the SBIWTP would be higher than for the Bajagua plant. We did not conduct such an analysis because it requires credible estimates of the amount of wastewater that will need to be treated by the Bajagua plant on an annual basis over the next 20 years, above the 25 million gallons per day (mgd)

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that will be coming from the SBIWTP. As the report notes on page 3 of the letter and in more detail in enclosure III, page 26, existing estimates vary widely on when treatment capacity over 25 mgd will be needed, calling into question whether the per unit cost of wastewater treatment can be accurately estimated.

6. The report does not include the costs of sludge disposal because these costs are not borne by the USIBWC, but rather are paid for by the Mexican government in accordance with Treaty Minute 283.
7. As the report states on page 2, we did not independently verify the cost and timeline data submitted by either Bajagua, LLC or the USIBWC. We did, however, assess the reliability of the cost and timeline estimates we received against the criteria contained in our Cost Assessment Guide.
8. The decision concerning which project is the best "on the merits" is a policy decision for Congress and the executive branch to make by weighing numerous and often conflicting policy goals. We can assist the decision makers by providing relevant data and analysis.
9. Our assessment of the reliability of the cost and timeline estimates focused on a 20-year period because that is the term of the proposed contract between the USIBWC and Bajagua, LLC. As the report notes in enclosure III, page 31, after 20 years, ownership of the Bajagua plant would transfer to Mexican authorities and the U.S. federal government's service fee obligation to Bajagua, LLC would end. However, the operations and maintenance costs for pumping primary treated water from the SBIWTP to the Bajagua plant would remain. Beyond that obligation, whether the United States would continue to incur additional costs related to the Bajagua facility, or whether the Mexican government would assume those costs, is not known at this time.
10. See comment 6. As the report states on page 2, there were a number of issues related to wastewater treatment in the U.S.-Mexico border region that we did not assess, including how the Mexican government disposes of the sludge it receives from the SBIWTP and whether improperly disposed of sludge enters the Pacific Ocean and ultimately pollutes California's beaches.
11. Because Bajagua, LLC does not yet have a final contract with a design-build-operate (DBO) contractor and a fee-for-services agreement between the USIBWC and Bajagua, LLC has not been finalized, we believe it is too soon to safely conclude that the risk of cost overruns on the Bajagua project will not be borne by the United States.
12. We did not assess the extent to which the cost of the Bajagua plant could be offset by revenues from the sale of reclaimed water for several reasons.

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First, Bajagua, LLC did not provide us information on how and when it plans to construct facilities that would allow it to reclaim water from its plant. Second, Bajagua, LLC did not provide us estimates of how much it would cost to construct these facilities. Third, as we note in enclosure III, page 26 of the report, it is unclear how much wastewater the Bajagua facility would have available to treat and potentially reclaim. Fourth, the price that might be obtained for this water is not known. Fifth, the USIBWC, Bajagua, LLC, and the Mexican government would need to agree on the amount of revenue from reclaimed water sales that would go to the United States, and no negotiations to develop such an agreement have begun.

13. Our report shows in enclosure III, pages 46-51, that the Bajagua plant's timeline is subject to more unresolved issues than the timeline for the SBIWTP upgrade.
14. Bajagua, LLC characterizes its over 30 needed permits and approvals as "mainly minor"; nevertheless a delay in obtaining any one of them could delay its schedule. Delays could occur because the Bajagua project is logistically complex and as such will likely require thorough review before permit approval. Furthermore, the timing of some permits is dependent on the approval of others, and the permits and approvals will need to be obtained from governments in two countries.
15. According to the information that Bajagua, LLC provided to us, it has concessions from the Mexican government for the land for its plant site but not for rights-of-way needed to construct the pipelines to the plant as noted in enclosure III, page 50. We are aware that several Mexican government agencies support the project, but whether Bajagua, LLC can ultimately meet the requirements of these agencies to obtain the needed concessions, permits, and approvals in a timely manner remains an area of uncertainty.
16. USIBWC and Bajagua, LLC have not reached agreement on the terms of the fee-for-services agreement. As the report states in enclosure III, page 50, this is an area of uncertainty and could delay construction of the Bajagua plant. Our report also notes in enclosure III, page 50, that the USIBWC hopes that issues related to the fee-for-services agreement can be resolved before the DBO contract is ready. However, it is not unusual for negotiations to be characterized by conflicting views that take time to resolve.
17. In the hearing held on March 25, 2008, Judge Moskowitz discussed the possibility of ordering the USIBWC to sign the National Pollutant Discharge Elimination System (NPDES) permit. While he suggested he might order such an outcome, attorneys for both the USIBWC and the State of California expressed reservations, and there was collective

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agreement to revisit the issue should the USIBWC decide to pursue the Bajagua project. Therefore, this remains an area of uncertainty.

18. Our report acknowledges, in enclosure III, page 47, that one of the areas of uncertainty that could delay the SBIWTP upgrade timeline is if a lawsuit seeking to force the USIBWC to prepare a new environmental impact statement resulted in an injunction.
19. According to an EPA Region IX official, there is no EPA guidance stating that activated sludge systems are not effective without pretreatment of industrial discharges. Moreover, the same official said that a pretreatment program has been in place in Tijuana since 2001.
20. According to a California Coastal Commission official, a consistency determination and approval has already been granted for the SBIWTP to provide secondary treatment and no further review is anticipated.
21. As our report states on page 2, we did not assess the extent to which the USIBWC managed prior projects, which includes the existing SBIWTP, within their estimated costs and timeframes.

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