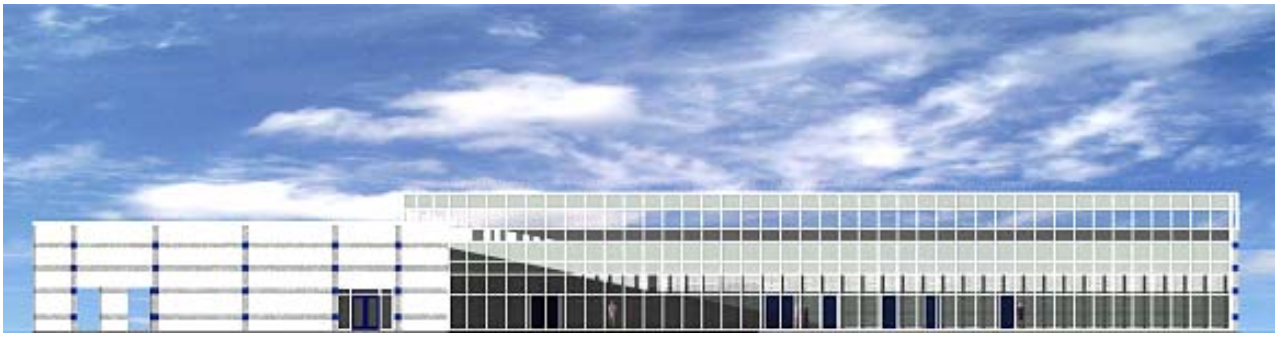
# DRAFT
# ENVIRONMENTAL IMPACT STATEMENT
# SUMMARY



# Proposed Leasing of Lands at Fort Bliss, Texas for the Proposed Siting, Construction, and Operation by the City of El Paso of a Brackish Water Desalination Plant and Support Facilities

**JULY 2004**

# SUMMARY

This Environmental Impact Statement (EIS) is being prepared to assist the United States (U.S.) Army in making a decision on a request by the City of El Paso, El Paso Water Utilities (EPWU) to acquire an easement for land at Fort Bliss, Texas, for construction and operation of a desalination plant and its supporting infrastructure. The EIS, hereafter referred to as the Fort Bliss Desalination EIS, complies with the National Environmental Policy Act of 1969, as amended (42 *United States Code* 4321 *et seq.*), implementation regulations adopted by the Council on Environmental Quality (40 *Code of Federal Regulations* [CFR] 1500 *et seq.*), and U.S. Army Regulation 200-2 (32 CFR Part 651).

## PURPOSE OF AND NEED FOR ACTION

The Army is preparing the Fort Bliss Desalination EIS to understand the environmental consequences that could result from granting an easement to the City of El Paso to use land in the South Training Areas of Fort Bliss for construction and operation of the proposed desalination plant and support facilities, including wells, pipelines, and disposal sites for the residual waste resulting from the desalination process.

The purpose of the proposed plant is to treat brackish (salty) water pumped from the Hueco Bolson Aquifer to provide potable water for use by the City of El Paso and Fort Bliss. The Hueco Bolson contains both potable and nonpotable brackish water. Potable water from the aquifer is currently pumped by Fort Bliss, the City of El Paso, small communities in Texas and New Mexico, and Ciudad Juárez, Mexico.

The objective of the proposed action is to provide an additional reliable source of potable water for the city and Fort Bliss. While the City of El Paso also obtains water from other sources, most of the potable water used by Fort Bliss is supplied by wells that draw water from the Hueco Bolson. Withdrawals of fresh water currently exceed the aquifer's recharge rate. Pumping of fresh water by EPWU, Fort Bliss, Ciudad Juárez, and others has resulted in declining groundwater levels in the bolson. The rate of decline has been less in the last 10 years in the El Paso area due to decreased pumping, but it continues to be a groundwater management challenge. In addition, brackish water is intruding into the aquifer's freshwater layer and has the potential to affect water wells on Fort Bliss and in other areas of El Paso.

A sizable volume of brackish water exists adjacent to the freshwater zone of the Hueco Bolson Aquifer. Desalination of the brackish deposits offers a way to extend the life of the freshwater aquifer as a source of potable water that is to the mutual benefit of Fort Bliss and the City of El Paso.

The proposed desalination plant would reduce withdrawals of fresh water from the bolson, extending the useful life of the aquifer and intercepting the flow of brackish water to wells that are operated by Fort Bliss. Both Fort Bliss and the City of El Paso have considered constructing desalination facilities to tap into this potential water source. The Army and EPWU believe that building a single desalination plant to provide potable water for both the installation and the city would be more efficient and cost effective than constructing separate desalination plants.

## ALTERNATIVES CONSIDERED INCLUDING THE PROPOSED ACTION AND NO ACTION ALTERNATIVE

The proposed desalination plant would treat brackish water drawn from the Hueco Bolson, referred to as "feed" water, using a technology called reverse osmosis (RO). RO uses semipermeable membranes to remove dissolved solids (primarily salts) from brackish water, producing fresh water. The result is two water streams: fresh water (called "**permeate**") and a concentrated brine formed from the salt removed from the brackish feed water (called "**concentrate**"). The permeate would be very pure, whereas drinking water contains some minerals, including salt. Therefore, the permeate would be mixed with brackish "blend" water, also drawn from the Hueco Bolson, prior to distribution in the public water supply. This procedure would also increase the volume of water output from the desalination plant. The blended water is called "finished" water. The finished water from the plant would comply with federal and state drinking water standards and be suitable for use as drinking water. The concentrate would have high total dissolved solids content (primarily salt and other minerals that occur in the feed water), more than 5,000 milligrams per liter, and would require disposal.

The plant is being designed to treat approximately 18.5 million gallons per day (MGD) of brackish water pumped from 15 existing EPWU feed wells to produce an estimated 15.5 MGD of permeate and 3.0 MGD of concentrate. The exact amount of permeate and concentrate would depend on a number of factors, including how brackish the feed water is and the efficiency of the RO process. Approximately 12.0 MGD of blend water would be pumped from 16 new blend wells and added to the permeate to yield approximately 27.5 MGD of finished water.

To implement the proposed desalination project, EPWU is applying for an easement for land in the South Training Areas of Fort Bliss for the following facility sites:

- **Desalination Plant Site.** This site would house the proposed desalination plant, ancillary buildings, utilities, access driveways, and parking areas. EPWU has requested that this site be located near its Montana Booster Station and existing water wells on the east side of El Paso International Airport (EPIA), in order to minimize the length of pipelines required and the ground disturbance associated with pipeline installation.
- **Concentrate Disposal Site.** Two disposal methods are being considered for the concentrate. One involves disposal underground through three to five injection wells located in the northeast corner of the South Training Areas. These wells would inject the concentrate deep underground into a confined zone where it would be isolated from potable water sources. The location of the deep-well injection wells is dependent on suitable geologic conditions that preclude the possibility of the concentrate degrading the quality of groundwater.

  The other disposal method under consideration involves piping the concentrate to evaporation ponds, where the liquid will evaporate leaving a solid salt residue that would be trucked to a landfill for final disposal. EPWU has identified its existing Fred Hervey Water Reclamation Plant as the location for the evaporation ponds. Additional adjacent land on Fort Bliss would be obtained to provide sufficient area to accommodate the projected volume of concentrate to be evaporated.
- **Wells and Pipeline Corridors.** Brackish water for desalination would be obtained from the Hueco Bolson using the existing EPWU feed wells located on city land on the east side of EPIA and would be conveyed through underground pipes to the desalination plant for treatment. Sixteen new blend wells would be located on Fort Bliss land along Loop 375 to provide water for blending with the permeate. The blend water would also be conveyed through underground pipes to the plant. Other underground pipes would convey the finished water produced at the plant to the city's water distribution system and transport the concentrate to the deep-well injection site or

evaporation ponds. Many of these pipelines would follow existing utility easements across the South Training Areas.

The total amount of Fort Bliss land needed by EPWU depends on the concentrate disposal method selected and the final locations of the desalination plant and pipelines. **Table S-1** provides the approximate acreage required for each project component.

**Table S-1. Approximate Acres of Army Land Required for the Proposed Project Components**

| Project Component/Site | Approximate Acreage |
|---|---|
| Desalination Plant Site and Pipelines from Feed Wells | 36.5 |
| Blend Well Sites (16) | 3.7 |
| Pipelines from Blend Wells to Plant | 35.8 |
| Concentrate Pipeline to Deep-Well Injection Site (from Loop 375) | 57.4 |
| Deep-Well Injection Sites (3-5) | 0.7-1.1 |
| Concentrate Pipeline to Evaporation Ponds | 25.8 |
| Evaporation Ponds (Fort Bliss land only)* | 394.0 |

* Total land area required for evaporation ponds estimated at 680.5 acres.

This EIS analyzes six action alternatives and the No Action Alternative. The action alternatives are listed in **Table S-2**. They include various combinations of three potential sites for the proposed desalination plant and two methods of disposal of the concentrate that results from the desalination process. The location of each of these sites is shown on **Figure S-1**.

**Table S-2. Summary of the Action Alternatives**

| Action Alternative | Desalination Plant Location [a] | Method for Concentrate Disposal |
|---|---|---|
| 1 | Site 1 | Deep-well injection |
| 2 | Site 2 | Deep-well injection |
| 3 | Site 3 | Deep-well injection |
| 4 | Site 1 | Evaporation ponds |
| 5 | Site 2 | Evaporation ponds |
| 6 | Site 3 | Evaporation ponds |

[a] See Figure S-1

Under the No Action Alternative, the Army would not provide land on Fort Bliss for construction and operation of the proposed desalination plant. None of the proposed facilities would be constructed on Army land at Fort Bliss. This alternative could, however, include one of the following actions without Army action or participation:

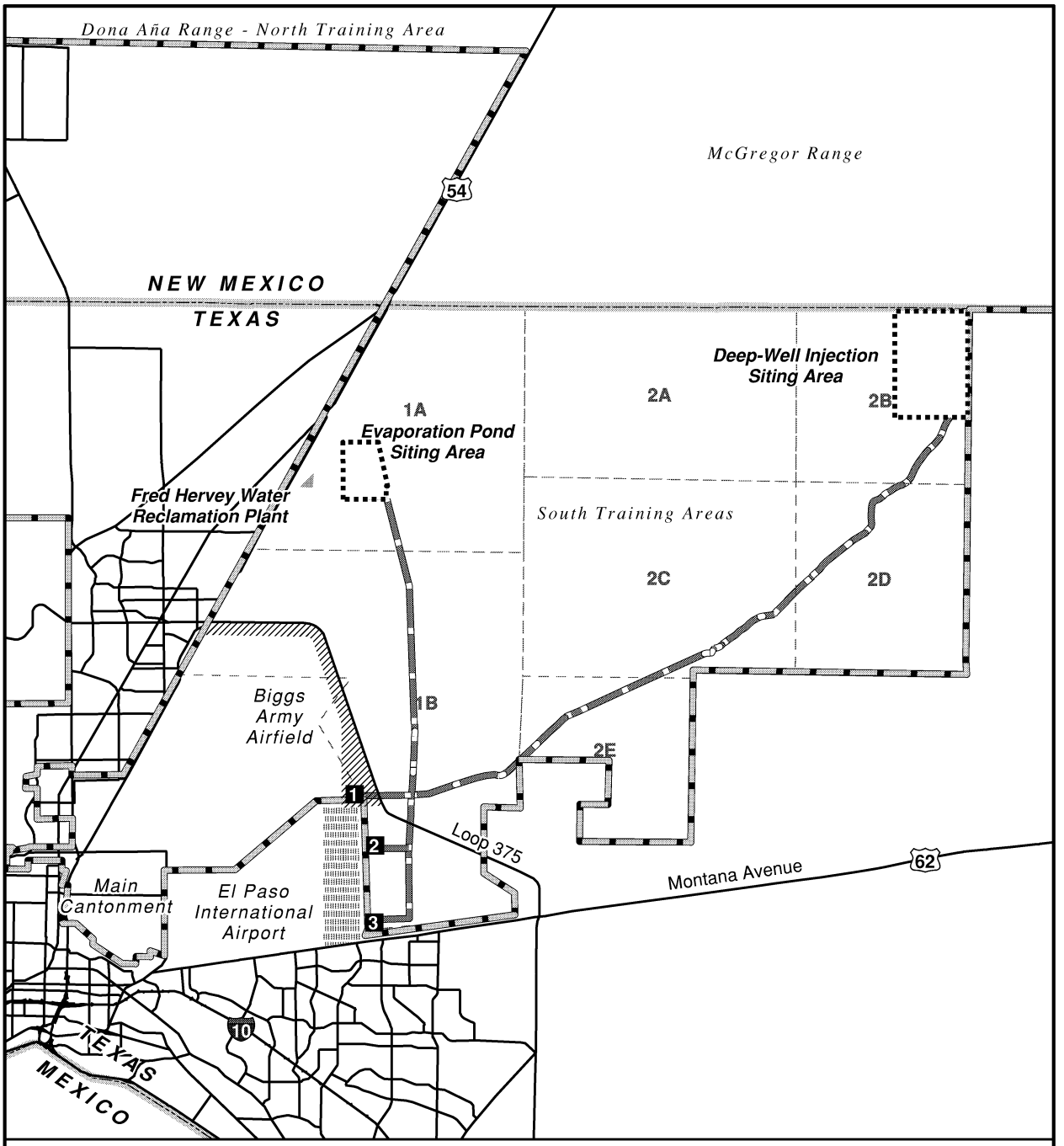



**Figure S-1. Alternative Locations for the Proposed Desalination Plant and Disposal Sites**

- Construction and operation of a desalination plant on non-Army land (e.g., Dell City);
- Increase in water conservation measures;
- Development of other water sources in the El Paso region;
- Importation of water from areas outside El Paso.

Without the proposed desalination project, both Fort Bliss and EPWU would continue to pump from the freshwater layer of the Hueco Bolson until it no longer met drinking water standards. The quantity of withdrawals would depend on demand, the effectiveness of water conservation measures, and the availability of other water sources, and is expected to be approximately the same whether or not the proposed desalination plant is built. While EPWU currently plans to pump approximately the same quantity of water as under the action alternatives, under the No Action Alternative, the withdrawals would occur from the freshwater layer of the bolson instead of from the brackish layer.

## COMPARISON OF ENVIRONMENTAL CONSEQUENCES OF THE ALTERNATIVES

The six action alternatives listed in Table S-2 and the No Action Alternative were analyzed to identify potential effects in the following ten areas:

- Geology and Soils
- Water Resources
- Utilities and Services
- Hazardous Materials, Hazardous Waste, and Safety
- Air Quality
- Biological Resources
- Land Use and Aesthetics
- Transportation
- Cultural Resources
- Socioeconomics and Environmental Justice

A brief summary of impacts of each alternative is provided below.

### Alternative 1

Under this alternative, construction of the desalination plant site and access road would disturb approximately 72-73 acres, increasing the risk of erosion and increasing short-term air pollutant emissions. During operation of the plant, there would be an increase in power consumption. Hazardous materials would be stored and used at the plant site, and there would be a slightly increased risk of an accidental spill of hazardous materials or waste at the site or during transportation of chemicals to or from the site. The development of Site 1 could conflict with the alignment of a planned connection from Loop 375 to EPIA and would require redesign of the access around the site. EPIA is in the process of revising its Master Plan.

Traffic would increase slightly along Montana Avenue and Loop 375. Access to Site 1 would be along a new roadway from Montana Avenue, which could have a minor adverse impact on traffic flow along this already congested route. Montana Avenue provides access to residential areas to the south and east, including areas that have higher than average minority and low-income populations.

Construction of the blend wells and the pipelines from the feed wells and blend wells to the plant site would disturb about 61-62 acres. Pumping from the existing feed wells would increase drawdown (lowering of the water table) of the groundwater level in the immediate vicinity of the wells by up to 90 feet, which would be up to 60 feet more than the drawdown projected without the desalination project. This could increase subsidence in the area around the desalination plant to a minor extent. The magnitude

of the drawdown would diminish with distance out to about 5-10 miles around the plant site. A similar although less pronounced drawdown would occur around the new blend wells. In order to pump the same total quantity of water from the aquifer as would be pumped without the desalination project, EPWU's plan is to reduce pumping from its other wells northwest of the project area. The reduced pumping would have the beneficial effect of impeding intrusion of higher salinity water into the area of the blend wells and existing water wells on Fort Bliss.

Construction of deep-well injection wells would disturb less than a quarter of an acre of land and vegetation at each of three to five injection sites and about 91-92 acres for installation of the concentrate pipeline from Loop 375 to the injection site. There would be a small risk of contamination of soil and the surficial aquifer with salts from the concentrate if there were a break or leak in the pipeline. Injection of concentrate at the wells could slightly increase the risk of localized low-intensity earthquakes by changing internal pressures within geologic formations. The injection site is located near a geothermal resource, and there is a small risk that deep-well injection of cooler water could interfere with future exploitation of this resource. However, available evidence indicates that concentrate injection would not affect geothermal resources. All other impacts would be negligible.

**Alternative 2**

The impacts from development of Alternative 2 would be essentially the same as Alternative 1. Total area disturbed during construction would be about 7 acres more than under Alternative 1. The desalination plant in this alternative would be exposed to a slightly higher level of noise from aircraft operations at EPIA and Biggs Army Airfield than under Alternative 1. However, the noise level would not be incompatible with the industrial activities at the plant.

**Alternative 3**

The impacts from development of Alternative 3 would be similar to Alternatives 1 and 2. Ground disturbance during construction would be about the same as Alternative 1. Although the distances between Plant Site 3 and the blend wells and the injection site would be longer, the access road would be shorter. Plant Site 3 is located in an area identified by EPIA for possible future industrial development, although EPIA is in the process of updating its Master Plan. If this site is selected for a desalination plant, other development would have to be located around the plant. This is not expected to adversely affect EPIA plans. The plant would be compatible with the type of industrial development anticipated by EPIA.

**Alternative 4**

Alternative 4 would have the same impacts from construction and operation of the desalination plant, blend wells, and feed and blend well pipelines as Alternative 1. It would differ in the impacts associated with disposal of the concentrate. The impacts from deep-well injection described for Alternative 1 would not occur under Alternative 4.

The construction of evaporation ponds would disturb as much as 748-749 acres of soil and vegetation with associated increase in soil erosion and dust emissions. After construction, about 680 acres would be converted into evaporation ponds. The increased ground disturbance for the ponds would be offset somewhat by the shorter length of the concentrate pipeline, which would disturb about 62-63 acres compared to the 91-92 acres disturbed under Alternative 1. The net difference would be about 703-718 more acres disturbed for the evaporation pond alternatives than the deep-well injection alternatives.

The ponds would be large and very visible, especially from elevated locations, although the existing landscape in this area is relatively featureless and undistinguished. During operation, there would be a minor risk of contamination of soil and the surficial aquifer by concentrate due to leaks or breaks in the pond liner or the pipeline leading from the desalination plant to the ponds. During certain weather conditions, there is a possibility that odors from the ponds would be noticeable from nearby residential areas, although they are not expected to be stronger than odors currently experienced from the existing oxidation ponds at the Fred Hervey Wastewater Reclamation Plant and a neighboring food processing plant.

The evaporating concentrate would have the potential to cause salt toxicosis and other toxicity in birds attracted to the ponds. If a large number of birds were attracted to the area, there would be a small risk of an outbreak of avian botulism. However, this site is not known to be used by large numbers of birds.

The evaporation ponds would produce approximately 100 tons per day of solids (primarily salt) requiring disposal in an appropriate landfill. This could exacerbate landfill capacity issues in El Paso.

### Alternative 5

The impacts of this alternative would be essentially the same as Alternative 4. Ground disturbance during construction would be about the same. Desalination plant Site 2 would be exposed to slightly higher aircraft noise levels than Site 1.

### Alternative 6

This alternative would be similar to Alternatives 4 and 5, with about 8 acres less of ground disturbance than Alternative 4. Land use impacts associated with desalination plant site would be slightly higher, as described for Alternative 3.

### No Action Alternative

If this alternative were selected, none of the impacts described above would occur on Fort Bliss land. Similar impacts could occur if a desalination project were developed on land outside Fort Bliss. If no desalination plant is built, freshwater supplies in the Hueco Bolson will continue to be depleted at a faster rate than with the proposed project. The length of time that freshwater resources would continue to be usable is not known and depends on other factors such as the amount of pumping, the effectiveness of conservation measures, drought conditions, and availability of other water sources. With continued pumping from existing EPWU freshwater wells, the intrusion of saline waters toward Fort Bliss wells would continue.

## EASEMENT CONDITIONS AND MITIGATION MEASURES

If an easement is granted by the Army to EPWU for construction and operation of the proposed desalination project, it will include conditions to protect the military mission and avoid or mitigate adverse environmental impacts. In some cases, monitoring will be conducted to verify compliance with the conditions, assess the effectiveness of the mitigation measures, or provide data that might trigger additional mitigation. **Table S-3** lists identified conditions and mitigation measures and indicates which would involve monitoring.

**Table S-3. Easement Conditions, Mitigation Measures, and Monitoring**

| Resource | Condition/Mitigation Measure | Monitoring | Alternative |
|---|---|---|---|
| Geology and Soils | Use dust suppression measures such as watering and application of soil stabilizers during ground disturbance (also Air Quality). | | 1–6 |
| | Install pressure monitors in the concentrate pipelines to detect leaks and/or catastrophic failure. | X | 1–6 |
| | Install a leak detection system under the evaporation ponds to allow early leak detection and corrective action. | X | 4–6 |
| Water Resources | Install pressure monitors in the concentrate pipelines to detect leaks and or catastrophic failure. | X | 1–6 |
| | Develop an emergency action plan to minimize the release of concentrate during an accident or equipment failure. | | 1–6 |
| | Evaluate the presence or absence of a connection between the injection zone and other aquifers during deep-well injectivity tests. | | 1–3 |
| | Install a leak detection system under the evaporation ponds to allow early detection and corrective action should leaks occur. | X | 4–6 |
| Air Quality | Water exposed soil frequently during construction to minimize fugitive dust. | | 1–6 |
| Biological Resources | Avoid disturbing any arroyo vegetation that may be present. | | 1–3 |
| | Maintain fresh water in the Fred Hervey oxidation ponds during bird migration to minimize potential salt toxicosis. | | 4–6 |
| | Monitor bird deaths at the evaporation ponds for possible toxicosis and to determine whether further mitigation measures need to be implemented. | X | 4–6 |
| | Monitor chemical concentrations in evaporation ponds quarterly and conduct screening-level toxicological risk assessments every five years. | X | 4–6 |
| Transportation | EPWU coordinate access requirements with Fort Bliss to ensure maintenance of the deep-well injection facility and concentrate pipelines can be performed with minimal interference with the Fort Bliss mission. | | 1–3 |
| | Design the entry and exit road from the desalination plant to Montana Avenue to minimize impact to traffic flow. | | 1–6 |