Environmental Assessment

Laughlin Air Force Base

Groundwater and Reclaimed Water Irrigation Project

Laughlin AFB, Val Verde County, Texas

Project Number: 04-3104

Prepared for:

Siemens Building Technologies Inc.
8600 North Royal Lane, Suite 100
Irving, Texas 75063

Enprotec / Hibbs & Todd
6310 Genoa Avenue, Suite E, Lubbock, Texas 79424
Phone: (806) 794-1100 / Fax: (806) 794-0778
Website: e-ht.com

September 2005

Report Documentation Page

Form Approved
OMB No. 0704-0188

1. REPORT DATE	2. REPORT TYPE	3. DATES COVERED
SEP 2005		**00-00-2005 to 00-00-2005**

4. TITLE AND SUBTITLE	5a. CONTRACT NUMBER
Environmental Assessment Groundwater and Reclaimed Water Irrigation Project Laughlin AFB, Val Verde County, Texas	5b. GRANT NUMBER
	5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER
	5e. TASK NUMBER
	5f. WORK UNIT NUMBER
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) **Enprotec / Hibbs & Todd,6310 Genoa Avenue, Suite E,Lubbock,TX,78424**	8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	10. SPONSOR/MONITOR'S ACRONYM(S)
	11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

15. SUBJECT TERMS

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT **unclassified**	b. ABSTRACT **unclassified**	c. THIS PAGE **unclassified**	**Same as Report (SAR)**	**83**	

TABLE OF CONTENTS

Laughlin Air Force Base
Groundwater and Reclaimed Water Irrigation Project
Laughlin AFB, Val Verde County, Texas

ACRONYMS AND ABBREVIATIONS

Acronyms and Abbreviations

AA	Alternative Action(s)
ACM	Asbestos Containing Materials
AFB	Air Force Base
AHERA	Asbestos Hazard Emergency Response Act
AICUZ	Air Installation Compatible Use Zones
bgs	Below Ground Surface
BOD	Biological Oxygen Demand
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CERCLA	Comprehensive Environmental Response, Compensation, & Liability Act
DOD	Department of Defense
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EMCS	Emergency Management Control System
EO	Executive Order
EPA	Environmental Protection Agency
FONSI	Finding Of No Significant Impact
FY	Fiscal Year
gpm	Gallons Per Minute
HDPE	High-Density Polyethylene
HP or **hp**	Horsepower
INRMP	Integrated Natural Resource Resources Management Plan
IRP	Installation Restoration Program

Acronyms and Abbreviations

msl	Mean Sea Level
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NOx	Nitrous Oxides
NRHP	National Register of Historic Places
OSHA	Occupational Safety and Health Administration
PA	Proposed Action
Pb	Lead
PM10	Respirable Particulate Matter less than 10 micrometers in diameter
PSD	Prevention of Significant Deterioration
RCRA	Resource Conservation and Recovery Act
SHPO	State Historic Preservation Office
SIP	State Implementation Plan
SOx	Sulfur Dioxides
SWPPP	Stormwater Pollution Prevention Plan
T & E	Threatened and Endangered
TCEQ	Texas Commission on Environmental Quality
TPDES	Texas Pollution Discharge Elimination System
TPWD	Texas Parks and Wildlife Department
TPY	Tons Per Year
TSCA	Toxic Substance Control Act
TX	Texas
U.S.	United States
USAF	United States Air Force
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOC	Volatile Organic Compound

Acronyms and Abbreviations

WWTP Wastewater Treatment Plant

FINDING OF NO SIGNIFICANT IMPACT (FONSI)

1.0 Name of Action

Laughlin AFB Groundwater and Reclaimed Water Irrigation Project.

2.0 Description of Proposed Action and Alternatives

The Proposed Action will use a combination of groundwater and reclaimed water from an existing on-site wastewater treatment plant (WWTP) to reduce the volume of potable water currently used for golf course irrigation. The Proposed Action, calls for the installation of a transfer pump, a reclaimed water transmission line, a reclaimed water storage pond, a pump station, an irrigation water transmission line and one or two water wells.

With the No-Action Alternative, Laughlin AFB would continue to irrigate the golf course with potable water and would continue to release reclaimed water to the Sacatosa Creek with no beneficial use. The No Action Alternative would result in continued potable water demands (average of 26.8-million gallons per year), continued expenses for potable water (approximately $50,000 per year), and failure to conserve / reutilize the reclaimed water (average of 30-million gallons per year).

3.0 Summary of Environmental Impacts

The Environmental Assessment (**EA**) provides an analysis of the potential environmental consequences associated with the Proposed Action and the No-Action Alternative. Implementation of the Proposed Action or the No-Action Alternative results in a finding of no significant impact for any resource area.

3.1 Earth Resources

With the implementation of recommended precautions, the Proposed Action will not significantly impact or threaten the physiography, topography, geology, and surface soils of the project area.

3.2 Water Resources

With the implementation of recommended precautions, the Proposed Action will not significantly threaten or impact groundwater and surface water supply or quality. The Proposed Action will conserve potable water and will have no impact on potable water quality. The Proposed Action will conserve and ensure the beneficial reuse of reclaimed water. Under the No-Action Alternative, there would be continued discharges of reclaimed water to the Sacatosa Creek without beneficial use.

3.3 Hazardous Materials and Wastes

The Proposed Action will involve a minimal use of hazardous materials and will result in the generation of no expected hazardous wastes. The Hazardous Materials Management Office will approve all hazardous materials before allowing them on base.

3.4 Health and Safety

With proper irrigation techniques and precautions, the use of reclaimed water for irrigation should not pose an undue health or safety hazard to the public. The implementation and enforcement of standard construction safety regulations should provide a satisfactory level of occupational safety during the construction of the Proposed Action.

3.5 Air Quality

The Proposed Action should not to have a significant impact on air quality.

3.6 Biological Resources

The Proposed Action should not significantly impact any vegetation, wildlife, species of concern, habitats of concern, or any relatively large areas of potential wildlife habitat. Irrigation with reclaimed water may change salinity and sodium effects on soils and call for adjustments to current turf-management practices.

3.7 Cultural Resources

The Proposed Action should not encounter or impact any cultural resources.

3.8 Pollution Prevention

With the implementation of recommended precautions, Pollution Prevention concerns become inconsequential to this project.

3.9 Socioeconomic Resources and Environmental Justice

The Proposed Action should not impact the population or housing resources of either Laughlin AFB or any surrounding communities. Similarly, changes in employment and economic activity will only be temporary. The conversion to alternate irrigation water sources will economically benefit Laughlin AFB (by an average of approximately $50,000 per year), but the City of Del Rio will subsequently suffer an equivalent loss in revenue (an estimated 0.5% revenue loss).

Implementation of the Proposed Action should not adversely or disproportionately impact any minority and low-income populations. With the implementation of the No-Action Alternative, there would be no change in baseline conditions or benefits to minority communities and low-income populations.

3.10 Land Use

The Proposed Action will not result in a conversion of land use and will not affect adjacent land.

3.11 Noise

Construction of the project would have minor, temporary impacts on the noise environment of the immediate project area. Once completed, the Proposed Action would have a negligible effect on ambient noise levels.

4.0 Conclusion

Based on the findings of the EA, the Proposed Action should not significantly impact human health or the natural environment. A Finding of No Significant Impact is warranted and an Environmental Impact Statement is not required for this action.

TOD D. WOLTERS, Colonel, USAF
Commander

EXECUTIVE SUMMARY

Currently, potable water is used to irrigate the grounds of the Leaning Pine Golf Course (**golf course**) at Laughlin AFB. The proposed project (**Proposed Action**) will convert the source of the irrigation water from potable water to a combination of groundwater and treated wastewater effluent (**reclaimed water**) from an existing on-site wastewater treatment facility.

The Proposed Action is not categorically excluded and must undergo the environmental assessment process. This Environmental Assessment (EA) describes the potential environmental consequences of the Proposed Action. The attached Proposed Elements Aerial and Vicinity Map illustrate the Proposed Action project area.

1.0 Environmental Impact Analysis Process

Hibbs & Todd, Inc. (HTI) has prepared this EA for Siemens Building Technologies, Inc. and the U.S. Air Force. This EA was prepared in accordance with the requirements of:

- The National Environmental Policy Act (NEPA) of 1969.
- The Council on Environmental Quality (CEQ) guidelines for implementing NEPA.
- United States Air Force procedural requirements for the implementation of NEPA (32 CFR 989).

2.0 Purpose and Need for Action

Potable water purchased from the City of Del Rio is currently used to irrigate the grounds of the Leaning Pine Golf Course at Laughlin AFB. A cost / benefit analysis has revealed that the Proposed Action will reduce irrigation expenses (approximately $50,000 per year), reduce demand on the potable water system (average of 26.8-million gallons per year), utilize reclaimed water that is currently being released to the environment without any beneficial use (average of 30-million gallons per year), and produce a positive

return on investment within eight years. Laughlin AFB recognizes the use of reclaimed water as a viable water conservation strategy.

3.0 Proposed Action and Non-Action Alternative

The Proposed Action will use a combination of groundwater and reclaimed water to reduce the potable water currently used for golf course irrigation. After treatment by settling and detention, Laughlin AFB will sample the effluent water to demonstrate that it meets specific TCEQ Type II reclaimed water criteria for biological oxygen demand and coliform count. The TCEQ defines Type II reclaimed water use as "use of reclaimed water where contact between humans and the reclaimed water is unlikely."

With implementation of the Proposed Action, a transfer pump will convey the treated and sampled reclaimed water from the WWTP lagoon through approximately 7,800-feet of subsurface 4-inch HDPE pipeline to a proposed reclaimed water storage pond. To meet TCEQ standards and prevent seepage, a 24-inch clay liner will line the reclaimed water storage pond. A proposed pump station will draw water from the reclaimed water pond through an 8-inch suction line and convey it to the irrigation system through approximately 1,500-feet of 8-inch HDPE transmission line. The 8-inch line will then tie-in to the existing main irrigation line. A double-check valve assembly will prevent backflow of the reclaimed water into the potable water system. Construction of the project will implement prescribed color-coding and protective measures to prevent the inadvertent use of reclaimed water for potable purposes.

When reclaimed water volumes are low, one or two proposed water wells drilled to a depth of 900 to 1,000-feet will pump groundwater to the existing golf course pond where it can be used as a supplemental water source during periods of maximum demand. In addition, the current potable water irrigation system will remain in place as a backup supply.

To utilize reclaimed water for irrigation, a wastewater permit must provide for an alternative means of disposal during times when there is no demand. Currently, the WWTP facility discharges reclaimed water to a tributary of the Sacatosa Creek and is authorized to discharge by an existing TCEQ wastewater

discharge permit. Since Laughlin AFB's existing wastewater discharge permit provides for disposal (discharge to the creek) during periods of no demand, this project will not require a new discharge permit or an amendment of the existing permit.

Reclaimed water used for irrigation purposes must meet TCEQ-defined Type II effluent criteria. Currently, Laughlin AFB WWTP must sample their effluent water to ensure it meets Type II reclaimed water criteria prior to discharging it to the creek. Since Laughlin AFB's existing wastewater permit requires Type II effluent compliance prior to disposal (discharge to the creek), the existing permit need not be amended for this project. Laughlin AFB will maintain records of both water volume and water quality and will report these data to the TCEQ on a monthly basis.

Type II effluent must be applied at times when contact between humans and the reclaimed water is unlikely. As such, the public may not use the irrigated golf course grounds when irrigation operations are in progress. Irrigation must take place during nighttime hours or during times when the golf course is closed to the public.

With the No-Action Alternative, Laughlin AFB would continue to irrigate the golf course with potable water and would continue to release reclaimed water to the Sacatosa Creek. The No Action Alternative would result in continued potable water demands, continued expenses for potable water, and failure to conserve / reutilize the reclaimed water.

4.0 Summary of Environmental Consequences

The Proposed Action involves excavation, trenching, pipeline installation, pond construction, building construction, water well drilling, irrigation with reclaimed water, and related activities; but none of these activities (except water well drilling) are anticipated to involve subsurface excavations exceeding 12-feet deep. The following precautions are recommended to protect environmental resources:

- Project design and installation should address the limitations of surface soils - particularly shrinking and swelling potential, corrosivity to uncoated steel, and seepage.

- Project design and installation should ensure that the Proposed Action does not significantly alter natural drainage patterns.
- During construction, standard construction erosion and sediment pollution control measures should be implemented as necessary to protect environmental resources.
- During construction, best management practices should be implemented to minimize waste and ensure the proper use of excavated soils.
- During construction, standard construction safety regulations should be enforced to ensure occupational safety.
- Although not observed or confirmed by this investigation, construction personnel should be alert for the Tobush Fishhook Cactus. If discovered, construction activities should be terminated until protective measures can be implemented.
- Although this investigation identified no cultural resources, construction personnel should be alert for artifacts or other items of cultural value. If any such items are unearthed, construction activities should be halted until an archeologist can evaluate the findings and implement necessary protective measures.
- Following construction, permanent site stabilization (replanting or landscaping) should be considered as necessary to prevent erosion, sedimentation, and excessive runoff to surface water bodies.
- Once completed, Laughlin AFB should implement routine monitoring and maintenance of the transmission lines and pond liner to minimize seepage and leakage of reclaimed water.
- Once completed, the water level in the reclaimed water storage pond should be monitored to maintain a minimum of two feet of freeboard.
- Once completed, Laughlin AFB must control the irrigation application rate to avoid substantial surface runoff or excessive percolation below the root zone. Reclaimed water should not be applied when the ground is water saturated or frozen.
- Once completed, human exposure to reclaimed water should be minimized by:

- Irrigating only during nighttime hours or when the golf course is closed to the public. The public may not use the irrigated portions of the golf course grounds when irrigation is taking place.
- Allowing time for the irrigation waters to dry or soak into the soil by requiring a minimum of four hours between irrigating the grounds and permitting public access.
- Adjusting sprinkler heads to avoid over-application to areas prone to forming puddles or becoming over saturated.
- Adjusting sprinkler heads to minimize spray drift towards public areas or access ways.
- Minimizing drift by using large droplet design sprinkler heads where necessary.
- Ensuring all non-potable lines and hose bibs are clearly color-coded and marked. Post signage as necessary in English and Spanish to indicate the presence of non-potable water.
- Briefing golf course personnel on the importance of personal hygiene when working on the irrigation system or non-potable water system.

With the implementation of the recommended precautions, the Proposed Action is not expected to impact the physiography, topography, geology, and surface soils of the project area. Under the No-Action Alternative, there would be no impacts to soils and no threat of reclaimed water seepage.

With the implementation of the recommended precautions, the Proposed Action is not expected to impact surface water and groundwater supply or quality. Under the No-Action Alternative, there would be no threats to surface waters or groundwater from reclaimed water runoff or seepage.

The Proposed Action will conserve potable water and will have no impact on potable water quality. Under the No-Action Alternative, there would be continued potable water demand and consumption.

The Proposed Action will conserve and ensure the beneficial use of reclaimed water. Beneficial use is an economic use of wastewater in accordance with TCEQ criteria which takes the place of potable and/or raw water that could otherwise be needed from another source. The use of reclaimed water in a quantity either less than or the economically optimal amount may be considered a beneficial use as long as it does not constitute a nuisance. Under the No-Action Alternative, there would be continued discharges of reclaimed water to the Sacatosa Creek without beneficial use.

The Proposed Action will involve a minimal use of hazardous materials and will result in the generation of no expected hazardous wastes unless there is an accidental spill or release of hazardous materials. Under the No-Action Alternative, no hazardous materials will be used and hazardous waste generation will remain unchanged.

With proper irrigation techniques and precautions, the Proposed Action is not expected to pose an undue health or safety hazard to the public. The implementation and enforcement of standard construction safety regulations should provide a satisfactory level of occupational safety during the construction phase of the Proposed Action. Under the No-Action Alternative, health and safety concerns would remain unchanged.

The Proposed Action is not expected to have a significant impact on air quality. Under the No-Action Alternative, existing conditions would remain as they are and air quality conditions in the area would not change.

The Proposed Action is not expected to significantly impact any vegetation, wildlife, species of concern, habitats of concern, or any relatively large areas of potential wildlife habitat. Irrigation with reclaimed water may change salinity and sodium effects on soils and call for adjustments to current turf-management practices. Under the No-Action Alternative, biological resources in the project area would not change and turf-management practices would not need to be altered.

The Proposed Action is not expected to encounter or impact any cultural resources. Under the No-Action Alternative, existing conditions would remain as they are and cultural resources in the project area – if any - would remain unchanged.

With the implementation of the recommended precautions, Pollution Prevention concerns become inconsequential to this project. Under the No-Action Alternative, wastewater would not be conserved by reuse as irrigation water, discharges to the creek would continue, and fertilizer application to the golf course grounds would remain unchanged.

The Proposed Action is not expected to have any socioeconomic impacts of consequence. The Proposed Action is not expected to impact the population or housing resources of either Laughlin AFB or any surrounding communities. Similarly, changes in employment and economic activity will only be temporary. The conversion to alternate irrigation water sources will economically benefit Laughlin AFB (by an average of approximately $50,000 per year), but the City of Del Rio will subsequently suffer an equivalent loss in revenue (an estimated 0.5% in total revenue loss). Under the No-Action Alternative, Laughlin AFB would not recognize an economic benefit and the City of Del Rio would not suffer an equivalent revenue loss.

Implementation of the Proposed Action is not projected to adversely or disproportionately impact any minority and low-income populations. With the implementation of the No-Action Alternative, there would be no change in baseline conditions or benefits to minority communities and low-income populations.

The Proposed Action will not result in a conversion of land use and will not affect adjacent land. With the implementation of the No-Action Alternative, there would, likewise, be no change in land use.

Once completed, the Proposed Action would have a negligible effect on ambient noise levels. Construction of the project, however, would have minor, temporary impacts on the noise environment of the immediate project area. Under the No-Action Alternative, existing noise conditions would remain unchanged.

No perceivable, negative relationship between the Proposed Action and past, present, or foreseeable actions was evident. Any actions that have or that are expected to take place affect very specific

operations on the base and would not be expected to result in more than negligible impacts individually or cumulatively, and the combined impacts would remain well below the threshold of significance for any resource category.

No irreversible or irretrievable resource commitments of consequence are associated with the Proposed Action.

This page intentionally left blank

This page intentionally left blank

ENVIRONMENTAL ASSESSMENT

1.0 Purpose and Need

1.1 Introduction

Potable water is currently being used to irrigate the grounds of the Leaning Pine Golf Course (**golf course**) at Laughlin AFB. The proposed project (**Proposed Action**) will convert the source of the irrigation water from potable water to a combination of groundwater and treated wastewater effluent (**reclaimed water**) from an existing on-site wastewater treatment facility.

The attached AF Form 813 indicates the Proposed Action is not categorically excluded from the environmental assessment process. This Environmental Assessment (**EA**), therefore, has been prepared to identify the potential environmental impacts, if any, associated with the Proposed Action.

1.2 Background

Home to the 47th Flying Training Wing, Laughlin AFB conducts undergraduate pilot training for the United States Air Force. Located on U.S. Highway 90E in Val Verde County, Laughlin AFB is approximately 6-miles east of the City of Del Rio, Texas, approximately 9-miles from the international bridge to Ciudad Acuna, Coahuila, Mexico, and approximately 150-miles west of San Antonio, Texas. With more than 3,300 people supporting its mission, Laughlin AFB has a significant economic impact on the City of Del Rio.

Originally established in 1940 as an Army Air Force B-26 training base, Laughlin AFB became an Air Training Command base in 1962 and was realigned under the Air Education and Training Command in 1993. The Leaning Pine Golf Course was developed and opened in 1968.

Potable water is currently being used to irrigate the grounds of the golf course. A cost / benefit analysis has revealed that converting the source of the irrigation water from potable water to a combination of groundwater and reclaimed water will reduce irrigation expenses, reduce demand on the potable water

system, and reduce discharges of reclaimed water to a tributary of the Sacatosa Creek. Based on current consumption and water costs, Laughlin AFB expects to recover its investment in the Proposed Action within eight years.

1.3 Purpose and Need

Laughlin AFB recognizes the use of reclaimed water as a viable water conservation strategy that will conserve potable water, reduce irrigation expenses, and reduce discharges of reclaimed water to a tributary of the Sacatosa Creek. The Proposed Action will utilize a combination of groundwater and reclaimed water to replace the use of potable water currently purchased from the City of Del Rio.

Based on figures from the past four years, the Proposed Action would:

- Conserve 7.9 to 47.9-million gallons of potable water per year (average of 26.8-million gallons per year).
- Save Laughlin AFB between $15,000 to $90,500 per year in potable water costs (average of $50,277 per year).
- Utilize between 10 to 50-million gallons of reclaimed water (average of 30-million gallons per year) that is currently being released to the environment without any beneficial use.

1.4 Environmental Issues and Scope of Analysis

The Proposed Action involves excavation, trenching, pipeline installation, pond construction, building construction, water well drilling, irrigation with reclaimed water, and related activities. Proposed project elements include the permanent installation of a transfer pump, a reclaimed water transmission line, a reclaimed water storage pond, a pump station, an irrigation water transmission line, and one or two water wells.

According to the AF Form 813 – Section II - Preliminary Environmental Survey, the Proposed Action is anticipated to have a positive impact on water resources, an unknown effect on safety and occupational

health, and a negligible effect on air installation compatible use, land use, air quality, hazardous materials / wastes, biological resources, cultural resources, geology and soils, socioeconomic resources, and other resources.

Due to the nature of the Proposed Action, the scope of analysis for this EA assesses the following issues:

- **Earth Resources**
  (Physiography, Topography, Regional Geology, Local Geology, Prime Farmland / Rangeland, Hydric Soil, Floodplains / Drainage)
- **Water Resources**
  (Surface Water, Groundwater, Potable Water, Reclaimed Water)
- **Hazardous Materials and Wastes**
- **Health and Safety**
- **Air Quality**
- **Biological Resources**
  (Vegetation, Wildlife, Sensitive Species)
- **Cultural Resources**
- **Pollution Prevention**
- **Socioeconomics and Environmental Justice**
- **Land Use**
- **Noise.**

1.5 Regulatory Compliance

This EA has been prepared to satisfy the requirements of the National Environmental Policy Act (**NEPA**) promulgated by the Council on Environmental Quality (**CEQ**) in 40 CFR 1500-1508. The intent of NEPA is to protect, restore, and enhance the environment through well-informed federal decisions.

In addition, this EA has been prepared in accordance with the requirements of 32 CFR 989 – Environmental Impact Analysis Process (**EIAP**), which establishes the specific procedural requirements for the United States Air Force's implementation of NEPA. This EA also complies with environmental regulations of the Endangered Species Act, Clean Air Act (**CAA**), and National Historic Preservation Act (**NHPA**), which are identified under each resource discussion.

2.0 Description of the Proposed Action and No-Action Alternative

2.1 Proposed Action

2.1.1 Project Summary

Potable water is currently being used to irrigate the grounds of the Leaning Pine Golf Course at Laughlin AFB. The Proposed Action will convert the source of the irrigation water from potable water to a combination of groundwater and treated wastewater effluent (reclaimed water) from an existing on-site wastewater treatment facility. The Proposed Action will involve the installation of a reclaimed water transfer pump, a 4-inch reclaimed water transmission line, a reclaimed water storage pond, an irrigation pump station, an 8-inch irrigation main line, and one or two water wells.

The project location is illustrated on the attached Vicinity Map. The attached Project Elements Aerial illustrates the proposed locations of the project elements.

2.1.2 Reclaimed Water

The Laughlin AFB wastewater treatment plant (**WWTP**) treats an average of 210,000-gallons per day of domestic sewer water. Influent flow is fairly consistent with slight increases following rainfall events. Currently, the reclaimed water (treated wastewater effluent) is discharged to a tributary of the Sacatosa Creek (**creek**). The volume of reclaimed water discharged to the creek is significantly less than the influent flow would suggest. Since the wastewater treatment method includes a pond system; evaporation is a significant factor in reducing the final volume of reclaimed water. Due to evaporation, reclaimed water

volume during the summer months can be significantly reduced to the point that no water is available for discharge.

In lieu of discharging to the creek, the Proposed Action will provide a means for utilizing the reclaimed water to help meet the golf course's irrigation demands. During periods of peak irrigation demand, it is anticipated that all of the reclaimed water available will be utilized for irrigation. During periods of lower demand, the reclaimed water will be stored in a proposed reclaimed water pond on the golf course. If the proposed pond reaches capacity, the remainder of the reclaimed water will be retained in the wastewater lagoons or discharged to the creek.

Laughlin AFB's current wastewater discharge stream to the creek meets the requirements of the Texas Commission on Environmental Quality (**TCEQ**). Likewise, the use of reclaimed water for irrigation is subject to TCEQ rules (30 TAC Chapter 210 – Use of Reclaimed Water). Laughlin AFB must submit a request for reclaimed water authorization to the TCEQ, and authorization must be granted before irrigation with reclaimed water commences.

Current TCEQ rules allow for irrigation with wastewater only after the wastewater has been treated in accordance with Laughlin AFB's wastewater permit. Also, the wastewater permit must provide for an alternative means of disposal during times when there is no reclaimed water demand. Since Laughlin AFB's existing wastewater discharge permit provides for disposal (discharge to the creek) during periods of no demand; the existing permit need not be amended for this project.

Laughlin AFB will be the producer, provider, and user of reclaimed water. The producer is defined as the entity that produces reclaimed water by treating domestic or municipal wastewater. The provider is defined as the entity that distributes the reclaimed water to the user; and the user is defined as the entity utilizing the reclaimed water for a beneficial use. As such, Laughlin AFB will be responsible for sampling the reclaimed water prior to distribution (pumping to the proposed reclaimed water pond) to ensure the water quality meets its intended use criteria.

For discharges to the creek or for irrigation use, the reclaimed water must meet Type II effluent criteria. Laughlin AFB will be responsible for maintaining the quality of reclaimed water consistent with Type II quality parameters (Biological Oxygen Demand - 30 mg/L, Fecal Coliform (grab sample) - 800 CFU/100 mL, and Fecal Coliform (average) - 200 CFU/100 mL). In accordance with 30 TAC 210.34, Laughlin AFB will sample Type II reclaimed water once per week and the reclaimed water must meet Type II criteria over a 30-day average. In accordance with 210.36, Laughlin AFB will maintain records of both water volume and water quality and will report the data to the TCEQ on a monthly basis.

Type II effluent is defined as the use of reclaimed water where contact between humans and the reclaimed water is unlikely. As such, the public may not use the irrigated golf course grounds when irrigation operations are in progress. Irrigation must take place during nighttime hours or during times when the golf course is closed to the public. The public can be at the facility in areas where irrigation is not taking place. For example, irrigation of the golf course fairways at night would not prohibit the use of the clubhouse or other facilities located a sufficient distance from the irrigation.

2.1.3 Groundwater

During summer months when reclaimed water volumes are low, the irrigation system will require a supplemental water source to meet demands. This project proposes the installation of one or two new water wells to meet this need.

A local water well drilling company was consulted to determine that a water well must be drilled to a depth of 900 to 1,000-feet to provide a delivery capacity of 200-gpm or more. The proposed well will include an 8-$^{5}/_{8}$" diameter steel casing and a 4 to 6-inch black steel column pipe from the surface to the pump. A 30 to 40-hp pump below the casing will be set into the open hole (water bearing cavern).

Based on historical usage, only one water well will be necessary if it can deliver at least 200-gpm. A second water well may be necessary if the first well cannot deliver enough water to meet historic irrigation demands. A 6-inch discharge line will convey the groundwater from the well to the existing golf course

pond. As shown in Project Elements Aerial, the proposed location for the water well(s) is near the existing golf course pond.

2.1.4 Potable Water

The proposed project recommends that the current potable water irrigation system remain in place as a backup supply. A gate valve will be installed on the new pipeline from the proposed irrigation pump station. The valve on the existing municipal water pump station can be closed during normal use, but can be opened to provide a temporary water supply in the event of maintenance to the proposed reclaimed water system or storage facilities. An existing double-check valve assembly will prevent backflow of water from the irrigation system to the potable water system.

2.1.5 Reclaimed Water Storage Pond

The existing golf course pond has an estimated capacity of 4-million gallons. Based on maximum monthly historical water usage for irrigating the golf course (approximately 8.9-million gallons), the peak irrigation demand can be more than twice the volume of this pond. Because of the existing pond's limited capacity - and because the existing pond does not meet TCEQ liner requirements for reclaimed water storage - a pond for the storage of reclaimed water is proposed.

The Project Elements Aerial indicates the proposed reclaimed water storage pond will be located adjacent to and will share a common berm with the existing pond. The proposed pond dimensions of 100-feet long by 80-feet wide with a water depth of 8-feet and 3:1 side slopes; will result in a total water capacity of approximately 260,000-gallons. According to 30 TAC Section 210.23(c) and Figure 1: 30 TAC Section 210.23(c), Laughlin AFB is located in a vulnerable area with respect to groundwater pollution potential as defined by a DRASTIC Pollution Potential Index rating of 110 or greater. Therefore, the reclaimed water storage pond must be constructed with a clay liner, at least 24-inches thick, compacted in lifts no greater than 6-inches, and compacted to 95% of Standard Proctor Density. The soil liner material must meet the following particle size gradation and Atterberg limits:

- 30% of more passing a number 200 mesh sieve; and

- A liquid limit of 30% or greater; and
- A plasticity index of 15 or greater, and
- Have a permeability less than or equal to 1 x 10^{-7} cm/sec.

The reclaimed water supply of 125-gpm to the reclaimed water pond in conjunction with a maximum pump station capacity of 450-gpm pumping out of the reclaimed water storage pond will require supplemental water from the existing pond during periods of maximum demand.

2.1.6 Irrigation Pump Station

The existing irrigation pumping facility consists of a 40-hp pump connected to the potable water distribution system with a capacity of approximately 450-gpm. The existing pump (see photos) boosts the pressure from the distribution system to operate the irrigation system.

The proposed pump station will consist of a 40-hp vertical turbine pump and a 7.5-hp submersible "jockey" pump mounted over a 4-foot diameter wet well. The water will be drawn from the reclaimed water pond through an 8-inch suction line with a self-cleaning screen attached to the end. A variable frequency drive will operate the 40-hp pump motor for varying demands. The pump will be sized to deliver an average of 460-gpm with a maximum capacity of approximately 540-gpm. An 8-inch transmission line is proposed to tie-in on the discharge side of the existing booster pump near the clubhouse facility. A reduced pressure double-check valve assembly exists on the suction side of the existing pump and will remain in service in order to prevent backflow of the reclaimed water into the potable water system.

The pump station will consist of a concrete slab, metal framing and roof, and split face masonry block for the walls. The masonry block will be consistent in type and color with surrounding masonry work on the base campus. The Project Elements Aerial shows the location of the proposed pump station on the southwest side of the existing pond.

2.1.7 Transmission Lines

A 4-inch high-density polyethylene (**HDPE**) pipeline will convey the reclaimed water from the wastewater lagoons to the proposed reclaimed water storage pond. The pipeline will be installed along the most feasible route to the new pond. The route will be planned to allow for convenient expansion of the irrigation system to other areas of the base for future reclaimed water use. The Project Elements Aerial illustrates one potential route for the 4-inch transmission main; however, local conditions may warrant rerouting the pipeline for ease of construction. Approximately 7,800-feet of pipeline is required from the wastewater lagoons to the existing golf course pond.

The new irrigation pump station will convey water to the irrigation system through a new 8-inch HDPE transmission line. The proposed route for the irrigation main is shown in the attached Project Elements Aerial. Approximately 1,500-feet of 8-inch pipeline is required to tie-in to the 8-inch main irrigation line on the discharge side of the existing booster pump. The existing 8-inch main irrigation line only occurs for a short distance prior to branching into several smaller lines. Major irrigation water line improvements would be necessary for an alternate tie-in point.

2.1.8 Non-Potable Plumbing

All hose bibs and faucets will be painted purple and designed to prevent connection to a standard water hose. Hose bibs will be located in locked, below-grade vaults - or placed in a non-lockable box that can only be operated by a special tool - and both will be clearly labeled as non-potable water. Signs in both English and Spanish will be posted at all storage areas and on all hose bibs and faucets to indicate the presence of non-potable water.

All exposed piping and piping within buildings will be either purple pipe or painted purple. All subsurface piping will be manufactured in purple, painted purple, taped with purple metallic tape, or bagged in purple. The existing subsurface irrigation piping located on the golf course may be used for distributing reclaimed water without modifications.

2.2 No-Action Alternative

With the No-Action Alternative, Laughlin AFB would continue to irrigate the golf course with potable water, continue to pay for potable water, and would continue to release reclaimed water to the Sacatosa Creek without any beneficial use to the base. The No Action Alternative would result in continued potable water demands, continued expenses for potable water, and failure to conserve / reutilize the reclaimed water.

3.0 Affected Environment

3.1 Introduction

This section presents information on environmental conditions for resources potentially affected by the Proposed Action and No-Action Alternative described in Section 2.0. Under NEPA, the analysis of environmental conditions should address only those areas and environmental resources with the potential to be affected by the Proposed Action. The environment includes all areas and lands that might be affected, as well as the natural, cultural, and socioeconomic resources they contain or support. In the environmental impact analysis process (**EIAP**), the resources to be analyzed are identified and the expected potential impacts are defined.

3.2 Earth Resources

Earth resources are the natural geologic features that characterize a setting as well as the physical elements that make up that setting. Since the Proposed Action involves excavation, trenching, pipeline installation, pond construction, building construction, water well drilling, irrigation with reclaimed water, and related activities, certain earth resources could be potentially threatened.

3.2.1 Physiography

Val Verde County is located in southwestern Texas and the Rio Grande River defines its southern boundary. The county has an area of 3,259 square miles, or 2,085,760-acres, of which approximately 36,990-acres are water areas larger than 40-surface acres in size. These water areas are mainly Lake Amistad, the Rio Grande River, the Pecos River, and the Devils River. Del Rio is the county seat and the

county's major town. Other communities include Comstock, Langtry, Juno, Pumpville, Pandale, and Loma Alta.

Val Verde County is primarily ranch country with approximately 98% of the undeveloped land used as rangeland and the remainder used as pasture, vineyards, and orchards. Soil, water, wildlife, and natural gas are the county's most important natural resources. The deep soils of the county are capable of producing large amounts of forage, while the shallow soils are used mainly for sheep, goat, and cattle range. There are abundant supplies of good quality water from springs, rivers, and wells. Plentiful supplies of rock for construction and caliche for road building are also present.

Most of the county is in the Edwards Plateau major land resource area, but the southeastern part is in the Rio Grande Plain major land resource area. The Edwards Plateau is part of the Great Plains, and the Rio Grande Plain is part of the Gulf Coastal Plain.

Val Verde County is located at the confluence of four major physiographic features: the Stockton Plateau in the southwest corner of the county, the Pecos Canyons in the center of the county, the Edwards Plateau making up most of the county, and a small portion of the Balcones Escarpment in the southeast corner of the county.

The Balcones Escarpment, superposed on a curved band of major normal faults, bounds the eastern and southern Edwards Plateau. Its principal area includes the Hill Country and a broad plateau. Stream erosion of the fault escarpment sculpts the Hill Country from Waco to Del Rio. Hard Cretaceous limestones cap the Edwards Plateau and the terrain is generally rough with shallow soils. Numerous rivers and streams and their tributaries have formed ridges, hills, and deep narrow valleys, and have cut canyons several hundred feet deep. The upper drainages of streams are waterless draws that open into box canyons where springs provide permanently flowing water. Sinkholes commonly dot the limestone terrain and connect with a network of caverns. Alternating hard and soft marly limestones form a stairstep topography in the central interior of the province.

The Edwards Plateau includes the Stockton Plateau, a mesalike land that is the highest part of this subdivision. With westward decreasing rainfall, the vegetation grades from mesquite juniper brush westward into creosote bush tarbush shrubs. The Pecos River erodes a canyon as deep as 1,000-feet between the Edwards and Stockton Plateaus. Its side streams become draws forming narrow blind canyons with nearly vertical walls. The Pecos Canyons include the major river and its side streams. Steep-walled canyons and bedrocks of limestones and dolomites characterize the Pecos Canyons. Vegetation is sparse, even near springs and streams. Laughlin AFB is located in the general area where the Edwards Plateau and Pecos Canyons abut.

3.2.2 Topography

Surface elevations in Val Verde County range from approximately 900-feet above mean sea level (**msl**) in the south to approximately 2,350-feet msl in the north. In the project area, topographic surface elevations range from approximately 1,087-feet msl in the northwest (near the existing golf course pond) to approximately 1,050-feet msl in the southeast (near the wastewater lagoons). The project area topography creates a natural drainage watershed that roughly bisects the golf course and directs stormwater runoff to the two existing golf course ponds and on to a stormwater retention basin. On the golf course, the project area grounds have been graded and modified to impart the gently rolling grounds typical of golf courses.

3.2.3 Regional Geology

Most of the Edwards Plateau is underlain by hard limestone that is highly resistant to erosion. A small part is underlain by more easily eroded soft limestone, marl, and shale. The surface geology consists of sedimentary rock derived from deposits of three geologic periods. The rocks dating from the Cretaceous Period are 75 to 135-million years old and were deposited under marine conditions. The materials from the Tertiary and Quaternary Periods are less than 30-million years old and were deposited by fresh water. No deposits of coal, iron, or other metals of commercial value are known to exist.

At the end of the Jurassic Period, the North American continent was mostly dry land. Then the Cretaceous seas advanced into the interior of the western part of the continent. Cretaceous history is largely a record

of the deposits of this last great invasion of the sea into North America. In Val Verde County, the dominant bedrock material is Cretaceous and is divided into the older Comanche Series (Lower Cretaceous - Fredericksburg and Washita Groups) and the more recent Gulf Series (Upper Cretaceous – Eagle Ford and Austin Groups).

The formations of the Fredericksburg Group that crop out in this county are Salmon Peak Limestone, Devils River Limestone, and Edwards Limestone. Where these formations are at the surface, the topography ranges from gently sloping and gently undulating to very steep. The layers of limestone vary in resistance to erosion, resulting in a stairstep topography on the dissected uplands. There are many small drainageways, a few deeply incised rivers and streams, and well-developed floodplains in these formations.

Salmon Peak Limestone crops out along the southern edge of the Edwards Plateau. The layers of limestone and mudstone are up to 310-feet thick. In the southern part of the area occupied by this formation, Zorra and Langtry soils formed in materials derived from the rocks, while Ector soils developed in the northern part.

Devils River Limestone crops out in the southern part of the Edwards Plateau. It is laterally equivalent to Salmon Peak Limestone and McKinght Formation. The layers of limestone, mudstone, and dolomite are as much as 700-feet thick. Ector and Tarrant soils formed in material derived from the rocks of this formation in the eastern part of its area, while Langtry soils formed in the material in the western part.

The Segovia Member represents Edwards Limestone in the northern half of Val Verde County and is equivalent to the upper part of Devils River Limestone. The layers of limestone, dolomite, and marl are up to 380-feet thick and are thickest in the southern part of their area. Rolling to steep Ector soils and nearly level to gently undulating Tarrant and Kavett soils formed in material derived from this formation.

The outcroppings of the Washita Group in Val Verde County consist of Del Rio Clay and Buda Limestone. Del Rio Clay crops out in the southern part of the county on narrow, steep side slopes. It lies conformably over Edwards Limestone or Devils River Limestone. The rock is up to 200-feet thick and feathers out

toward the northwest. The layers of shale and siltstone turn yellow after weathering and develop into Felipe soils. With very sparse vegetation, these areas are sometimes called "badlands". The material of this formation is easily eroded where not protected by the overlying Buda Limestone.

Buda Limestone crops out in scattered areas throughout the southern part of the county. The fine-grained, massive limestone and marl is up to 100-feet thick and is thickest to the east. It lies unconformably over Del Rio Clay or Devils River Limestone. The Buda Limestone caps are generally resistant to weathering and form a landscape of gently undulating to rolling hills. Langtry and Zorra soils formed in material derived from this formation.

The Gulf Series consists of Eagle Ford and Austin Groups. Eagle Ford Group and Boquillas Flags are laterally equivalent, both lying unconformably over Buda Limestone. Eagle Ford Group generally crops out southeast of the Pecos River with a gently sloping to gently rolling topography. The rock consists of flaggy shale, siltstone, and limestone; and it is up to 200-feet thick, thinning out to the northeast. Amistad soils formed in materials derived from this formation.

Boquillas Flags generally drops out southwest of the Pecos River. Topography ranges from nearly level areas to very steep hills. The formation consists of interbedded limestone, siltstone, silty limestone, and shale and is up to 220-feet thick. Mariscal, Lozier, and Shumla soils formed in material derived from this formation.

Austin Chalk crops out in the southwestern part of the county and lies unconformably over Eagle Ford Group and Boquillas Flags ranging from gently sloping, gently undulating to very steep topography. The rock ranges from hard lime mudstone to soft chalk. It is up to 580-feet thick in the eastern part and thickens to the southwest. Langtry, Lozier, and Shumla soils formed in material derived from this formation.

The only Tertiary deposit in Val Verde County is Uvalde Gravel, which is of Pliocene age. Uvalde Gravel consists of loose gravel embedded in caliche. This formation mantles Cretaceous rocks and forms high, gently undulating plains not associated with present drainage patterns. During the Tertiary Period,

Cretaceous sediments were exposed to weathering and erosion. Then the Balcones fault uplifted the Edwards Plateau to its present level above the Rio Grande Plain. This uplift increased the gradient of streams in the area and the faster flowing water could carry more sediment. Large quantities of sediment were washed from the Edwards Plateau and deposited on the Rio Grande Plain. These deposits were subsequently eroded, leaving only gravel-capped divides of Uvalde Gravel. In some areas parallel to the Rio Grande, the gravel is mainly igneous. Uvalde material developed into Olmos, Jimenez, Quemado, Zapata, and Vinegarroon soils.

The Quaternary material in Val Verde County is river-deposited sediment, or alluvium, of Pleistocene and Recent times. The Pleistocene (ice age) material forms fluvial terrace deposits, alluvial fans, and colluvium. This material consists of moderately thick to thick beds of calcareous gravel, sand, silt, and clay. Beds of caliche are present in some areas. Alluvial fan deposits and colluvium are very minor. Most of the fluvial deposits are on narrow, flat terraces between areas of Uvalde Gravel and the present flood plain. These materials developed mainly into Acuna, Valverde, Laredo, Reynosa, Rio Diablo, and Olmos soils.

Recent flood plain deposits are in the narrow, flat areas adjacent to major steams and rivers, such as the Rio Grande, Sycamore Creek, Red Bluff Creek, Devils River, Dry Devils River, Dolan Creek, San Felipe Creek, Langry Creek, Howards Creek, Pecos Rivers, and Johnson Draw. These sediments are unconsolidated mixed gravel, sand, silt, and clay. Also included is bedrock, which is found in stream channels in places. These alluvial deposits are the parent material of Rio Grande, Dev, Hodgins, Lagloria, and Pintas soils. These soils are subject to periodic floods, except for the Lagloria soils, which are on high terraces above the Rio Grande.

3.2.4 Local Geology

The soils underlying Laughlin AFB were formed in old alluvium over caliche and limy earth. These soils include the Olmos-Acuna-Coahuila group characterized by clayey and loamy soils that are gravelly and deposited on terraces and uplands in depths ranging from very shallow to deep. The attached Soil Survey Map illustrates that the project area overlies the following native soil types:

- **Coahuila Clay Loam (0 to 3% Slopes) (CoB)**

  This soil surrounds the west and south sides of the wastewater lagoons. The reclaimed water transfer pump and part of the reclaimed water transmission line will be installed on or in this soil. This deep, nearly level to gently sloping soil occurs over old stream terraces and low uplands and is moderately alkaline and calcareous throughout. This soil is characterized with good drainage, moderate surface runoff, moderate permeability, and moderate water capacity. The rooting zone is deep and the water erosion hazard is slight to moderate. Excess lime, shrinking and swelling potential, low strength for roads, corrosivity to uncoated steel, and seepage are the main limitations. The high content of carbonates causes the surface to be dusty when dry.

- **Olmos Very Gravelly Loam (1 to 8% Slopes) (OmD)**

  From the wastewater lagoons, the proposed reclaimed water transmission line proceeds north along a road (extension of 4th Street) overlying Olmos Very Gravelly Loam soil. This shallow, gently sloping to sloping soil occurs on old outwash deposits on uplands and about 45% of the surface is covered by limestone gravel. Typically, the surface layer is moderately alkaline and the next 6-inches is indurated caliche. The underlying material – to a depth of about 60-inches – is weekly-cemented caliche with embedded gravel. This soil is characterized with good drainage, moderate surface runoff, moderate permeability in the upper part, slow permeability in the indurated caliche, and very low water capacity. The rooting zone is shallow and the water erosion hazard is moderate. This soil is poorly suited to most urban and recreational uses with the cemented pan, small stones, thin surface layer, and corrosivity to uncoated steel being the main limitations.

- **Zapata-Vinegarroon Complex (1 to 5% Slopes) (ZaC)**

  As the proposed reclaimed water transmission line veers west to run immediately south of Carlson Street and Vandenberg Drive, Zapata-Vinegarroon Complex soil will be encountered. A portion of the proposed 8-inch irrigation main line will also be installed in this soil. This soil complex consists of shallow, gently sloping soils occurring on uplands and formed over thick beds of caliche. This soil typically has a surface layer about 8-inches thick of moderately

alkaline clay or gravelly loam underlain by 5 to 10-inches of strongly cemented or indurated caliche. Weekly cemented caliche is found at a depth of approximately 13 to 24-inches. This soil is characterized with good drainage, moderate surface runoff, moderate permeability, and very low water capacity. The rooting zone is shallow and the water erosion hazard is moderate. This soil is poorly suited to most urban uses with cemented pan, thin surface layer, and corrosivity to uncoated steel being the main limitations.

- **Acuna Silty Clay (0 to 3% Slopes) (AcB)**

  As the proposed reclaimed water transmission line nears the existing golf course pond, Acuna Silty Clay will be encountered. The proposed water well(s), irrigation pump station, reclaimed water storage pond, and a portion of the 8-inch irrigation main will be installed on or in this soil. This deep, nearly level to gently sloping soil occurs over stream terraces and low uplands and is moderately alkaline throughout. A distinct layer of calcium carbonate accumulation (less than 40-inches from the surface) differentiates this soil from other soils in the project area. This soil is characterized with good drainage, moderate surface runoff, moderate permeability, and moderate water capacity. The rooting zone is deep and the water erosion hazard is slight to moderate. Seepage, clayey texture, excess lime, shrinking and swelling potential, low strength for roads, and corrosivity to uncoated steel are the main limitations.

3.2.5 Prime Farmland / Rangeland

Val Verde County has no naturally occurring prime farmland. If irrigated, however, about 5.6% of the county meets prime farmland criteria established by the U.S. Department of Agriculture. Some of this potential prime farmland is located on Laughlin AFB and includes those areas with Acuna Silty Clay and Coahuila Clay Loam soils. Due to its federal use, prior build-up, existing urban use, and / or lack of developed adequate irrigation water, however, the lands comprising the project area are exempt from consideration as prime farmland or rangeland.

3.2.6 Hydric Soil

Only those soils that are ponded, frequently flooded, or otherwise wet for long durations meet the anaerobic conditions associated with hydric soils. Hydric soils are developed under conditions sufficiently wet to support the growth and regeneration of hydrophytic vegetation. Except for man-made water bodies - the wastewater lagoons and existing golf course ponds - none of the soils identified in the project area meet the criteria of hydric soil normally associated with wetlands.

The wastewater lagoons and existing golf course ponds are not listed on a National Wetlands Inventory Map.

3.2.7 Floodplains / Drainage

The attached Flood Map indicates the project area is not located in a floodplain. The stormwater retention basin and associated streams located south of the existing golf course ponds are designated as being located in a "Zone A" flood zone.

3.3 Water Resources

Water resources are the surface waters, natural stormwater watersheds, and groundwater features that characterize a setting as well as the physical elements that make up that setting. Since the Proposed Action involves excavation, trenching, pipeline installation, pond construction, building construction, water well drilling, irrigation with reclaimed water, and related activities, certain water resources could be potentially threatened.

3.3.1 Surface Water

The Proposed Action has the potential of impacting the following nearby surface waters:

- Northernmost existing golf course pond. This pond will share a common berm with the proposed reclaimed water storage pond and will potentially be exposed to irrigation water runoff.

- Southernmost existing golf course pond. This pond is located approximately 1,200-feet southeast of the proposed reclaimed water storage pond. This pond will potentially be exposed to irrigation water runoff.
- Wastewater treatment lagoons from which reclaimed water will be pumped. These lagoons are located more than one-mile southeast of the proposed reclaimed water storage pond and will not be potentially exposed to irrigation water runoff.
- Tributary to the Sacatosa Creek to which reclaimed water is currently being discharged. This tributary is located more than one-mile southeast of the proposed reclaimed water storage pond and will not be potentially exposed to irrigation water runoff.
- A natural stormwater drainage watershed passing through the golf course and communicating with both golf course ponds. This watershed will be exposed to irrigation water runoff.
- A stormwater retention basin and streams that communicate with the stormwater drainage watershed and the southmost existing golf course pond. The discharge from the southernmost pond to the stormwater retention basin is located approximately 1,200-feet southeast of the proposed reclaimed water storage pond. This stream will potentially be exposed to irrigation water runoff. The stormwater retention basin is located more than 2,500-feet south of the proposed reclaimed water storage pond and communicates with streams further south.

The attached United States Geological Survey (USGS) Map illustrates the locations of these surface water bodies and drainage watersheds. Only the existing golf course ponds and the wastewater treatment lagoons have persistent water present. The Sacatosa Creek tributary, the stormwater drainage watershed, and the stormwater retention basin with its associated streams are shown to have only intermittent water, suggesting they are dry except in periods of heavy precipitation. None of the identified surface waters are directly used for potable water purposes, but waters reaching the Sacatosa Creek tributary and the stormwater drainage watershed may eventually discharge to surface waters used for potable water purposes.

Although located in a recreational area, and although there are fish present, water in the golf course ponds is not used for any intentional domestic, recreational, or fish / wildlife propagation purpose. Likewise, water in the wastewater lagoons is not used for any intentional domestic, recreational, or fish / wildlife propagation purposes.

It is not likely the Proposed Action will potentially impact any other surface waters.

3.3.2 Groundwater

The Edwards-Trinity Aquifer is the major groundwater source underlying the City of Del Rio and Laughlin AFB. This aquifer system extends over an area of more than 35,000-square miles in west-central Texas - primarily in the Edward Plateau subdivision of the Great Plains.

The Environmental Flight Chief for Laughlin AFB advised that water would be encountered approximately 35-feet bgs in the project area, but that this water does not represent a groundwater source. This is "perched" water reportedly induced by irrigation and pond seepage in the golf course area.

Hutto Drilling, a local water well drilling company, was consulted and advised that wells drilled approximately 200 to 250-feet beneath the project area would yield groundwater from the Austin Chalk formation and could not deliver the 200-gpm or more required by the Proposed Action. The TCEQ classifies water from this formation as a Class 2 Groundwater Resource having a lower yield and higher TDS (between 3,000 and 10,000 mg/L) than Class 1 groundwater.

The driller anticipates that a water well must be drilled to a depth of approximately 900 to 1,000-feet below ground surface (bgs) to deliver water from the Edwards-Trinity Aquifer and provide the necessary water volume. A well drilled to this depth is projected to provide a static water level of 0 to 100-feet bgs due to artesian conditions. The TCEQ classifies water from this formation as a Class 1 Groundwater Resource.

According to 30 TAC Section 210.23(c) and Figure 1: 30 TAC Section 210.23(c), Laughlin AFB is located in a vulnerable area with respect to groundwater pollution potential as defined by a DRASTIC Pollution

Potential Index rating of 110 or greater. Groundwater in the Del Rio area is sometimes brackish due to high salt content, but is generally suitable for irrigation purposes.

3.3.3 Potable Water

The City of Del Rio uses a combination of surface water and groundwater as its water supply. Its primary water source is received from the San Felipe Springs, which the TCEQ has defined as "groundwater under the influence of surface water". The City of Del Rio has also drilled groundwater wells to provide supplemental water in periods of drought.

Initially, the City of Del Rio disinfected its raw water with chlorine, but did not provide any further treatment, prior to distribution. In September 2002, to meet TCEQ water quality requirements, the City of Del Rio opened a potable water treatment plant using ultra-membrane filtration with the capacity to treat 16-million gallons of water per day. In addition to constructing the new plant, the city replaced raw water pumping facilities and water ground storage tanks, expanded distribution system pumps and transfer facilities, and rehabilitated city water wells. These improvements prevented leakage and provided additional water to the city.

According to the City of Del Rio's *Drought Contingency and Water Emergency Plan,* safe and high quality drinking water is a precious resource in the Del Rio area. The city requires that available water resources be put to maximum beneficial use and that waste, unreasonable use, and unreasonable methods of use be prevented – particularly during periods of drought.

Throughout its history, the Del Rio area has suffered through periods of drought. Annual rainfall averages 18.38-inches, but have varied from a high of 37.75-inches in 1914 to a low of 4.34-inches in 1956. In 2001, Del Rio suffered near-drought conditions with only 9.69-inches of annual rainfall.

3.3.4 Reclaimed Water

Laughlin AFB WWTP discharges between 10 to 50-million gallons of reclaimed water (average of 30-million gallons) per year. Currently, this water is discharged to a tributary of the Sacatosa Creek without any beneficial use to the base. The wastewater effluent is not disinfected, but is treated in settling ponds and tested to ensure it meets Type II effluent criteria, before being discharged.

3.4 Hazardous Materials and Wastes

The Proposed Action will involve a minimal use of hazardous materials and will result in the generation of no expected hazardous wastes. All hazardous materials must be approved through the Hazardous Materials Management Office before the hazardous material is allowed on base.

3.5 Health and Safety

The implementation and enforcement of standard construction safety regulations should provide a satisfactory level of occupational safety during the construction of the Proposed Action. Once constructed, however, excessive human exposure to the reclaimed water could potentially pose a health and safety hazard.

Reclaimed water must be treated prior to discharging it to the reclaimed water pond. TCEQ regulations do not require chemical disinfection if the reclaimed water is detained in the settling lagoons for at least 21-days to allow settling. To meet TCEQ requirements, Laughlin AFB WWTP will sample the reclaimed water to demonstrate that it meets Type II effluent criteria (Biological Oxygen Demand - 30 mg/L, Fecal Coliform (grab sample) - 800 CFU/100 mL, and Fecal Coliform (average) - 200 CFU/100 mL) prior to pumping it from their wastewater lagoon to the reclaimed water storage pond. In addition, when reclaimed water supplies are low, the available reclaimed water will be mixed (diluted) with groundwater from the proposed water well(s) and the existing golf course pond.

Despite treatment by settling / detention, sampling precautions, and intermittent dilution, Type II effluent can contain more pathogens than potable water. According to the American Water Works Association, the level of treatment required for a specific non-potable reuse of reclaimed water depends on the potential for human contact or ingestion. The TCEQ requires that human exposure to Type II effluent be minimized.

3.6 Air Quality

Air quality in a given location is determined by the concentration of various pollutants in the atmosphere. Federal and / or state ambient air quality standards are used to determine the significance of a pollutant concentration in a geographical area. Under the authority of the Clean Air Act, the Environmental Protection Agency (**EPA**) has established nationwide air quality standards to protect public health and welfare, with an adequate margin of safety. These federal standards, known as the National Ambient Air Quality Standards (**NAAQS**), represent the maximum allowable atmospheric concentrations for six "criteria" pollutants: ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, respirable particulate matter less than 2.5 and 10 micrometers in diameter, and lead. The EPA designates areas of the United States as having air quality equal to or better than NAAQS (attainment) or worse than NAAQS (non-attainment).

Under the CAA, state and local agencies may establish air quality standards and regulations of their own, provided these are at least as stringent as the federal requirements. The State of Texas has adopted the federal NAAQS requirements for all criteria pollutants. Texas has four urban areas (Dallas-Fort Worth, Houston-Galveston, El Paso, and Beaumont-Port Arthur) that exceed the federal standards for ozone and one area (El Paso) that is a "non-attainment" area exceeding the federal standards for carbon monoxide and particulate matter.

Air quality impacts from the Proposed Action would be significant if they increase ambient air pollution concentrations above any NAAQS, contribute to an existing violation of any NAAQS, interfere with or delay timely attainment of NAAQS, and / or impair visibility within any federally mandated Prevention of Significant Deterioration (**PSD**) Class I area. The closest PSD Class I area is Big Bend National Park located ~150-miles west of the Proposed Action location.

According to the EPA, any proposed federal action that has the potential to cause violations in a non-attainment or maintenance area must undergo a conformity analysis. A conformity analysis is not required in an attainment area. Since Val Verde County, Texas, has been designated as attainment (and is not a maintenance area) for all criteria pollutants, a conformity determination is not required and was not performed.

3.7 Biological Resources

Since the Proposed Action involves activities likely to disturb vegetation, wildlife, and habitats in the immediate area, certain biological resources could be potentially impacted. Biological resources include living, native or naturalized, plant and animal species and their habitats. This analysis focuses on species or vegetation types that are important to the function of the ecosystem, of special societal importance, or are protected under federal or state law or statute. For this EA, these resources are divided into three major categories: vegetation, wildlife, and sensitive species.

3.7.1 Vegetation

Vegetation includes all existing terrestrial plant communities with the exception of sensitive species. Vegetation native to the soils identified in the project area includes Arizona cotton top, blackbrush, buffalograss, bush sunflower, various cacti, cane bluestem, cenizo, condalia, curlymesquite, dalea, desert yaupon, ephedra, fall witchgrass, green sprangletop, guajillo, guayacan, hairy grama, hairy tridens, lovegrass tridens, menodora, mesquite, orange zexmenia, paloverde, panicum, pinhole bluestem, pink pappusgrass, plains bristlegrass, plains lovegrass, pricklypear, ragweed, range ratany, red grama, reverchon, sideoats grama, silver bluestem, slim tridens, spiny hackberry, tanglehead, tasajillo, Texas kidneywood, Texas wintergrass, threeawn, tobosa, velvet bundleflower, vine ephedra, vine mesquite, and whitebush.

Since the proposed reclaimed water transmission line will largely follow roadways or pass through the golf course grounds, the vegetation likely to be encountered in the project area has, for the most part, already

been disturbed by development, grading, replanting, mowing, herbicide treatment, and other grounds maintenance activities. The proposed water transmission line will be routed to minimize impacts or damage to ornamental trees on the golf course. If the Proposed Action destroys any ornamental tree(s) on the golf course, the tree(s) will be replaced with an equivalent tree(s).

Irrigation with reclaimed water can present challenges to and force changes in current grounds-maintenance practices. Reclaimed water irrigation can result in changes to the soils' electrical conductivity and sodium adsorption ratio. Total salts (including calcium, potassium magnesium, sulfates, and sodium chloride) in the reclaimed water can cause an osmotic effect on plants as they accumulate in the root zone and may have a "sealing" affect on the soils' structure and permeability. The presence of organic matter, detergents, bleaches, phosphates, chemicals, nitrogen, and / or metals, reduces the quality of reclaimed water when compared to the potable water currently used for irrigation, but in some cases reduces the need for fertilizer application.

Under the Proposed Action, only the golf course grounds will be irrigated with reclaimed water. For the most part, the irrigated grounds have been replanted to replace native vegetation and most of the irrigated turf is planted in bermudagrass, which is fairly salt tolerant. The issue of irrigation with reclaimed water is more of an agronomical issue than an environmental issue, calling for adjustments to current turf-management practices to deal with sodium effects on the soil and salinity.

3.7.2 Wildlife

Wildlife includes all vertebrate animals (fish, amphibians, reptiles, birds, and mammals) with the exception of those identified as sensitive species in Section 3.7.3. The Coahuila Clay Loam, Zapata-Vinegarroon Complex, and Olmos Very Gravelly Loam soils making up the bulk of the project area are rated as having only a very poor to fair potential for wildlife habitat because of the lack of cover and food. The Acuna Silty Clay soils have a fair potential for wildlife habitat and some birds have been known to nest in these areas. Based on the soil types identified in the project area, terrestrial wildlife known to inhabit such terrain may include deer, javelina, turkey, quail, dove, and several songbirds.

The grounds located south and adjacent to the golf course are undeveloped native land that is occasionally leased to base personnel for hunting purposes. According to interviews, wildlife observed in the hunting area and golf course grounds include whitetail deer, turkey, dove, cottontail rabbits, jackrabbits, skunks, fox, lynx, squirrels, hawks, coyotes, rattlesnakes, blue indigo snakes, migratory ducks, and numerous songbirds.

Reported wildlife found in and around the existing golf course ponds include bass, perch, catfish, frogs, toads, turtles, cranes, migratory ducks, and nutria. The ponds may support other fish, amphibian, and reptile species.

Since the proposed reclaimed water transmission line will largely follow roadways or pass through the golf course grounds, any wildlife likely to be encountered in the project area has already, for the most part, been disturbed by development, grading, replanting, mowing, and other grounds maintenance activities.

3.7.3 Sensitive Species

Sensitive species are defined as plant and animal species listed as threatened, endangered, or proposed as such, by the U.S. Fish and Wildlife Service (**USFWS**) or Texas Parks and Wildlife Department (**TPWD**). The Endangered Species Act protects federally listed, threatened, and endangered plant and animal species. The law does not protect federal species-of-concern; however, these species could become listed and, therefore, protected at any time. Their consideration early in the planning process may avoid future conflicts that could otherwise occur. TPWD protects state-listed plant and animal species through their fish and wildlife administrative codes.

A visit to the USFWS and TPWD websites determined federal and state sensitive species that have the potential to occur in the proposed project area. The website research resulted in the identification of the following sensitive species found in the Texas Hill Country wildlife management area or specific to Val Verde County:

- **Tobush Fishhook Cactus (Ancistrocactus Tobuschii) (Plant) -**
  Listed by USFWS and TPWD as endangered, this cactus is normally found in very shallow gravelly soil over limestone and in shortgrass areas within live oak-juniper shrublands.

- **Texas Snowbells (Styrax Texana) (Plant) -**
  Listed by USFWS as endangered, Texas snowbells are a shrub or small tree that grows out of crevices on steep limestone bluffs, rock ledges, or cliff faces along creeks. They are also found in the dry gravels of streambeds.

- **Texas Hornshell (Popenaias Popei) (Invertebrate - Mollusk – Clam) -**
  Listed by USFWS as a candidate taxon (proposed for protection), very little is known about this species' habitat preferences or requirements. They are normally found in colonies in flowing water, pools, or riffles that have sand and sand-cobble accumulated in travertine bedrock cracks or at the base of large boulders.

- **San Marcos Salamander (Eurycea Nana) (Amphibian) -**
  Listed by TPWD as threatened / endangered in the Texas Hill Country wildlife management area, the USFWS does not list this salamander as a species-of-concern in Val Verde County and is known to occur only in clear spring water coming from the headwaters of the San Marcos River.

- **Texas Blind Salamander (Typhlomolge Rathbuni) (Amphibian) -**
  Listed by TPWD as endangered in the Texas Hill Country wildlife management area, the USFWS does not list this salamander as a species-of-concern in Val Verde County and is known to occur only in the subterranean streams of the Purgatory Creek system near San Marcos, Texas.

- **Devils River Minnow (Dionda Diablo) (Fish) -**
  Listed by USFWS as threatened, the Devils River minnow is found in channels of fast-flowing, spring-fed waters over gravel substrates.

- **Northern Aplomado Falcon (Falco Femoralis Septentrionalis) (Bird) -**
  Listed by TPWD as endangered, the Northern Aplomado falcon prefers coastal prairies and

desert grasslands with scattered yuccas and mesquites. They also inhabit oak woodlands and riparian gallery forests in the midst of desert grassland.

- **Bald Eagle (Haliaeetus Leucocephalus) (Bird) -**
  Listed by USFWS as threatened but proposed for delisting, the bald eagle prefers aquatic habitats (coastal areas, rivers, lakes, and reservoirs) with forested shorelines or cliffs. They select large, super-canopy roost trees – mostly conifers.

- **Black-Capped Vireo (Vireo Atricapilla) (Bird) -**
  Listed by USFWS and TWPD as endangered throughout its range, the black-capped vireo nests in Texas during April through July and spends the winter on the western coast of Mexico. Nests are usually built in the forks of the branches of shrubs located on rangelands with scattered clumps of shrubs separated by open grassland.

- **Brown Pelican (Pelecanus Occidentalis) (Bird) -**
  The USFWS lists the brown pelican as endangered in Texas. The brown pelican subsists mainly on fish, preferring to forage in shallow estuarine and inshore waters near coastlines. Known to nest on small coastal islands in trees or on the ground, these birds are rarely seen inland.

- **Golden-Cheeked Warbler (Dendroica Chrysoparia) (Bird) -**
  Listed by TPWD as endangered in the Texas Hill Country wildlife management area, the USFWS does not list this bird as a species-of-concern in Val Verde County. These birds inhabit woodlands with tall Ashe-juniper, oak, and other hardwood trees.

- **Least Tern (Sterna Antillarum) (Bird) -**
  The USFWS lists the least tern as endangered. The least tern subsists mainly on fish. The least tern is migratory and breeding grounds include the Rio Grande River system. These birds prefer riverine nesting areas with sparsely vegetated sand and gravel bars, or salt flats along lake shorelines. They have been known to nest along the shores of reservoirs and other manmade sites.

Of the two plant, one mollusk, two amphibian, one fish, and six bird species identified, the project area's habitat is likely to support only the Black-Capped Vireo and the Tobush Fishhook Cactus – an extremely rare cactus with only 35 known populations. The project area is not conducive to the roosting, breeding, nesting, or feeding habits of any of the identified bird species, but it is possible these species may overfly and even temporarily light in the project area.

According to the Environmental Flight Chief at Laughlin AFB, a recently conducted, base-wide study concluded that base activities have not threatened sensitive species or their habitats.

3.8 Cultural Resources

Cultural resources are any prehistoric or historic district, site or building, structure or object considered important to a culture, subculture, or community for scientific, traditional, religious, or other purposes. Cultural resources include archaeological resources (both prehistoric and historic), historic architectural resources, and traditional cultural resources.

Cultural resources are subject to review under both federal and state laws and regulations. Significant archaeological and architectural resources are either eligible for listing, or listed on, the National Register of Historic Places (**NRHP**). Significant traditional cultural resources identified by Native American tribes or other groups may also be eligible for the NRHP. For a cultural resource to be considered eligible for the NRHP, it must possess integrity of location, design, setting, materials, workmanship, or association, and meet one or more of the following criteria (36 CFR 60.4):

- Association with events that have made a significant contribution to the broad patterns of our history
- Association with the lives or persons significant in our past
- Have distinctive characteristics of a type, period, or method of construction
- Represent the work of a master, or possess high artistic values

- Represent a significant and distinguishable entity whose components may lack individual distinction
- Have yielded, or be likely to yield, information important in prehistory or history.

Impacts to cultural resources must be considered by federal agencies during the course of their undertakings. Section 106 of the National Historic Preservation Act (**NHPA**) of 1966 empowers the State Historic Preservation Office (**SHPO**) to comment on federally initiated, licensed, or permitted projects affecting cultural resources listed or eligible for listing on the NRHP.

Only significant cultural resources (as defined in 36 CFR 60.4) are considered for potential adverse impacts from an action. The type and location of the proposed activity are assessed to identify cultural resources that may be impacted. Direct impacts may occur by physically altering, damaging, or destroying all or part of a resource; altering characteristics of the surrounding environment that contribute to the resource's significance; introducing visual or audible elements out of character with the property or alter its setting; or neglecting the resource to the extent that it deteriorates or is destroyed. Indirect impacts result primarily from the effects of project-induced population increases and the resultant need for construction to accommodate population growth.

The NRHP database identifies ten cultural resources in Val Verde County. Of these, four are located in Comstock and two are located in Langtry. Three are located within the city of Del Rio, approximately six-miles from the project area, and include the Cassinelli Gin House, the Del Rio Cemeteries Historic District, and the Val Verde County Courthouse / Jail. The last listing, the San Felipe Creek Archeological District, is located on private land owned by Lowe Ranch and was established to protect prehistoric Native American sites. The exact location of the cultural site is restricted and not accessible on the website.

According to the Del Rio Chamber of Commerce, Val Verde County has a long history of Native American occupancy from as long as 10,000-years ago. The county has one of the richest concentrations of aboriginal art on the continent with some pictographs dating to over 4,000-years BC. The county has over 400 archaeological sites, including caves, rock shelters, and mounds.

The project area is focused in a location that has already been modified by lagoon construction, road construction, grading, and golf course installation. Cultural resources of any significance are likely to have already been identified in the process of these modifications. A base-wide archeological report titled *"Integrated Cultural Resources Management Plan"*, was completed in October 2004 and indicates that no archeologically significant resources are located in the proposed project area.

3.9 Pollution Prevention

The Pollution Prevention Act and subsequent EPA publications define Pollution Prevention. Unlike waste minimization, the context of Pollution Prevention is not limited to solid and hazardous waste. Rather, it encompasses release to all media: air emissions, wastewater discharges / spills, stormwater discharges, releases to the soil / groundwater, as well as solid and hazardous waste generation. Pollution Prevention consists of source reduction which is any practice that:

- Reduces the amount of any hazardous substance, pollutant, or contaminant entering any waste stream or otherwise released into the environment (including fugitive emissions) prior to recycling, treatment, or disposal.
- Reduces the hazards to public health and the environment associated with their release.

In addition, Pollution Prevention includes other practices that reduce or eliminate the creation of pollutants through increased efficiency in the use of raw materials, energy, water, or any other resources; and / or protects of natural resources by conservation.

Wastes resulting from the Proposed Action's construction will include excavated soils and standard construction wastes. Once completed, wastewater will be used beneficially and is likely to result in a decreased need for fertilizer application to the golf course grounds.

3.10 Socioeconomics and Environmental Justice

3.10.1 Socioeconomics

Socioeconomic resources are characterized in terms of population, housing, employment, and economic activity. The Proposed Action is not expected to impact the population or housing resources of either Laughlin AFB or any surrounding communities. Similarly, although project construction activities may enhance local employment and economic activity, the effect will only be temporary. Because population and housing resources will not be impacted, and because increased employment will only be temporary, these socioeconomic issues have not been researched for inclusion in this report.

Currently, Laughlin AFB is irrigating the golf course with potable water purchased from the City of Del Rio. The table below shows the conversion to alternate irrigation water sources will economically benefit Laughlin AFB (by an average of $50,277 per year), but the City of Del Rio will subsequently suffer an equivalent amount of revenue loss.

Golf Course Water Usage and Costs		
Year	**Historical Use (gallons)**	**Cost (based on current pricing of $1.89 per 1000-gallons)**
2001	35,848,000	$65,752
2002	47,915,000	$90,559
2003	15,777,000	$29,800
2004	7,920,000	$15,000
Average	**26,865,000**	**$50,277**

3.10.2 Environmental Justice

In 1994, Executive Order (**EO**) 12898 (*Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*) was issued to focus federal agencies' attention on human health and environmental conditions in minority and low-income communities. This EO was also established to ensure that disproportionately high and adverse human health or environmental effects on these communities are

identified and addressed. This section focuses on the distribution of race and poverty status in areas potentially affected by implementation of the Proposed Action. This approach is in accordance with the *Interim Guide for Environmental Justice Analysis with the Environmental Impact Analysis Process* (U.S. Air Force 1997).

This analysis focuses on low-income and minority population areas that would be disproportionately affected by implementation of the Proposed Action. For purposes of this analysis, the following definitions apply:

- Minority populations are defined as: persons of Hispanic origin of any race, Blacks, American Indians, Eskimos, Aleuts, Asians, or Pacific Islanders.
- Low-income populations are defined as persons living below the poverty level, based on a total annual income of $17,062 for a family of four persons, as reported in the 2000 census.

Both Laughlin AFB and Del Rio are located in the 78840 zipcode. Zipcode-specific data from the 2000 U.S. Census (compiled by the Missouri Census Data Center) was used to analyze environmental justice issues. Of the ~44,239 citizens living within the zipcode, 91.8% are centralized in urban clusters with most (~33,867) living within the City of Del Rio. Only 8.2% of the population lives in rural areas and only ~129 of these citizens reside on farms.

Minorities populate a large percentage (78.7%) of the zip code (~76.2% Hispanic and 21.3% White). Of the ~31,653 citizens 16-years of age or older, only 53% are employed in the civilian labor force. Many families rely on public assistance or retirement incomes. Of the ~13,899 households in the zipcode, approximately 27.4% have household incomes of less than $14,999 per annum. The Median Family Income is $31,520, the Average Family Income is $40,302, and the Per Capita Income is $12,082. Approximately 11,398 citizens, or 26.2% of the population, are designated as "poor people".

3.11 Land Use

Land use generally refers to human modification of land, often for residential or economic purposes. It also refers to use of land for preservation or protection of natural resources such as wildlife habitat, vegetation, or unique features. The primary effect of Air Force Base activity on adjacent land use is noise generated by airfield operations and maintenance activities. On-base development occurs under planning guidelines designed to ensure compatibility of land uses with safety and operational requirements. On and off base height restrictions apply to structures and other objects (e.g., trees) in the vicinity of the airfield.

3.12 Noise

Noise is defined as any sound that is undesirable because it interferes with communication, is intense enough to damage hearing, or is otherwise annoying. Human response to noise varies according to the type and characteristics of the noise source, distance between source and receptor, receptor sensitivity, and time of day.

Noise analyses typically evaluate potential changes to existing noise environments that would result from implementation of a Proposed Action. Potential changes in the noise environment can be (1) beneficial (i.e., if they reduce the number of sensitive receptors exposed to unacceptable noise levels); (2) negligible (i.e., if the total area exposed to unacceptable noise levels is essentially unchanged); or (3) adverse (i.e., if they result in increased exposure to unacceptable levels).

Ambient background noise in urbanized areas typically varies from 60 to 70 dba but can be higher. Suburban neighborhoods experience ambient noise levels of approximately 45 to 50 dba. The exception to this is the noise associated with aircraft activity at Laughlin AFB. Noise levels from flight operations exceeding ambient background noise typically occur beneath main approach and departure corridors, under local air traffic patterns around the airfield, and in areas immediately adjacent to parking ramps and aircraft staging areas.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Introduction

This section presents an assessment of the potential environmental impacts of implementing the Proposed Action. The analysis in this chapter is based on an examination of the potential impacts of the Proposed Action and the No-Action Alternative (detailed in Section 2) on baseline conditions (examined in Section 3). Cumulative effects of the Proposed Action with other past, present, and reasonably foreseeable future actions are presented in Section 5.

4.2 Earth Resources

Laughlin AFB is physiographically located in the general area where the Edwards Plateau and Pecos Canyons abut. Natural stormwater drainage systems are plentiful in this region. In the project area, topographic surface elevations range from ~1,087-feet msl in the northwest (near the existing golf course pond) to ~1,050-feet msl in the southeast (near the wastewater lagoons) and create a stormwater drainage watershed that roughly bisects the golf course and directs stormwater runoff to the two existing golf course ponds and on to a stormwater retention basin.

The soils underlying Laughlin AFB were formed in old alluvium over caliche and limy earth and suggest an underlying geology of Pliocene-age Uvalde Gravel with beds of caliche, calcareous gravel, sand, silt, and clay. The project area soils are from the Olmos-Acuna-Coahuila group, which are clayey and loamy soils that are gravelly and deposited in depths ranging from very shallow to deep. As a group, these soils are moderately alkaline and calcareous with good drainage, moderate surface runoff, moderate permeability, and very low to moderate water capacity. The water erosion hazard is slight to moderate. Excess lime, shrinking and swelling potential, low strength for roads, corrosivity to uncoated steel, cemented pan, small stones, thin surface layer, clayey texture, and seepage are the main limitations associated with these soils.

The lands comprising the project area are exempt from consideration as prime farmland or prime rangeland. Likewise, the project area is not located in a floodplain and except for man-made surface

waters - the wastewater lagoons and existing golf course ponds - none of the soils identified in the project area meet the criteria of hydric soil normally associated with wetlands. The wastewater lagoons and existing golf course ponds are not listed on a National Wetlands Inventory Map.

The Proposed Action involves excavation, trenching, pipeline installation, pond construction, building construction, water well drilling, irrigation with reclaimed water, and related activities; but none of these activities (except water well drilling) are anticipated to involve subsurface excavations exceeding 12-feet deep. As such, the Proposed Action's construction will not affect the deep geological features or influence the project's design. If care is taken to ensure that natural drainage patterns are not disrupted, the Proposed Action is not expected to impact the physiography and topography of the project area or overly influence the project's design.

Surface soil limitations – particularly shrinking and swelling potential, corrosivity to uncoated steel, and seepage - should be carefully considered during the project's design and construction. With proper materials, engineering, and installation, these limitations can be satisfactorily overcome.

Reclaimed water meeting Type II effluent criteria will be pumped through transmission lines, contained in a storage pond, and applied via irrigation. Pond seepage, transmission line leakage, and excessive irrigation are not expected to adversely threaten underlying earth resources. Nonetheless, Laughlin AFB should implement routine monitoring and maintenance of the transmission lines and pond liner. Also, Laughlin AFB must control the irrigation application rate to avoid substantial surface runoff or excessive percolation below the root zone. Reclaimed water should not be applied when the ground is water saturated or frozen.

With the proper precautions, the Proposed Action is not expected to significantly impact earth resources. If the Proposed Action is not implemented, there would be no impacts to earth resources and no threat of reclaimed water seepage.

4.3 Water Resources

The evaluation of potential impacts to water resources considers the effects of implementing the Proposed Action or No-Action Alternative on water supply, water quality, and hydrologic characteristics. Potential impacts to potable water are also discussed. Since the Proposed Action involves excavation, trenching, pipeline installation, pond construction, building construction, water well drilling, irrigation with reclaimed water, and related activities, certain water resources could be potentially threatened.

4.3.1 Surface Water

Nearby surface waters include two existing golf course ponds, the wastewater treatment lagoons, the tributary to the Sacatosa Creek, and a stormwater drainage watershed that passes through the golf course and communicates with a stormwater retention basin and its associated streams. Only the existing golf course ponds and the wastewater treatment lagoons have persistent water. The other identified surface water bodies only have intermittent water during periods of heavy precipitation. None of the identified surface waters have any intentional domestic, recreational, or fish / wildlife propagation use, and none are directly used for potable water purposes.

Care should be exercised to ensure that natural drainage patterns are not disrupted. Also, the surface waters and drainage watersheds should be protected from sedimentation and excessive runoff of reclaimed water. Erosion and sediment pollution control measures should be employed as necessary during construction activities. The TCEQ requires these as part of the Stormwater Pollution Prevention Plan (**SWPPP**) for the Texas Pollution Discharge Elimination System (**TPDES**) construction general permit. Due to the relatively gentle slopes and the slight to moderate erosion potential of the native soils, proper implementation of standard best management practices will be adequate to minimize erosion and sedimentation. Permanent site stabilization should include replanting or adding landscaping as necessary to provide long-term erosion and sediment pollution control.

Reclaimed water meeting Type II effluent criteria will be pumped through transmission lines, contained in a storage pond, and applied via irrigation. Potential pond seepage and transmission line leakage are not

expected to adversely threaten nearby surface waters. Reclaimed water managed in ponds for storage must be prevented from discharging into the waters in the State, except for discharges directly resulting from rainfall events or in accordance with a permit issued by the TCEQ. Therefore, the reclaimed water storage pond should maintain a minimum of two feet of freeboard (distance between maximum water surface elevation and top of pond berm). Likewise, over application of irrigation water, should be avoided to minimize runoff into the surface waters via natural drainageways. Reclaimed water should not be applied when the ground is water saturated or frozen.

With precautions, the Proposed Action is not expected to have a significant impact on surface water resources in terms of supply or water quality. If the Proposed Action is not implemented, there would be no threats to surface waters.

4.3.2 Groundwater

Laughlin AFB is located in a vulnerable area with respect to groundwater pollution potential as defined by a DRASTIC Pollution Potential Index rating of 110 or greater. The Edwards-Trinity Aquifer is the major groundwater source, lying approximately 900 to 1,000-feet bgs and yielding TCEQ-defined Class 1 groundwater. Wells drilled approximately 200 to 250-feet beneath the project area yield Class 2 groundwater from the Austin Chalk formation. Water is also encountered approximately 35-feet bgs in the project area, but this water does not represent a groundwater source. This is "perched" water reportedly induced by past irrigation and pond seepage in the golf course area.

Reclaimed water meeting Type II effluent criteria will be pumped through transmission lines, contained in a storage pond, and applied via irrigation. Water from pond seepage, transmission line leakage, and excessive irrigation could potentially migrate to the "perched" water zone beneath the project area. Due to the depth of usable groundwater, the reclaimed water's quality, the filtration qualities and slight to moderate permeability of underlying soils, and local artesian conditions; it is not considered likely that reclaimed water reaching the "perched" zone will pose an undue threat to groundwater quality. Proper installation, routine

inspection, and proper maintenance of the pond and transmission line system, combined with proper application of irrigation water, should protect groundwater quality.

With precautions, the Proposed Action is not expected to have a significant impact on groundwater resources in terms of supply or water quality. If the Proposed Action is not implemented, there will be no threats to groundwater.

4.3.3 Potable Water

The Proposed Action will conserve potable water and will have no impact on potable water quality. If the Proposed Action is not implemented, there would be a continued potable water demand.

4.3.4 Reclaimed Water

The Proposed Action will utilize between 10 to 50-million gallons of reclaimed water (average of 30-million gallons) per year and ensure its beneficial use. If the Proposed Action is not implemented, discharges to the environment without beneficial use would continue.

4.4 Hazardous Materials and Wastes

The Proposed Action will involve a minimal use of hazardous materials and will result in the generation of no hazardous wastes. Under the No-Action Alternative, no hazardous materials will be used and hazardous waste generation will remain unchanged.

4.5 Health and Safety

Despite treatment by settling / detention, sampling precautions, and intermittent dilution, reclaimed water can contain more pathogens than potable water. According to the American Water Works Association, the level of treatment required for a specific non-potable reuse of reclaimed water depends on the potential for human contact or ingestion. The TCEQ requires that human exposure to Type II effluent be minimized. By

implementing the following precautions, potential health hazards posed by reclaimed water can be minimized:

- Irrigate during nighttime hours or when the golf course is closed to the public. The public may not use the irrigated portions of the golf course grounds when irrigation is taking place.
- Allow time for the irrigation waters to dry or soak into the soil by requiring a minimum of four hours between irrigating the grounds and permitting public access.
- Irrigate only on dry days. Do not irrigate during rainstorms, when the ground is saturated, or when the ground is frozen.
- Adjust sprinkler heads to avoid over-application to areas prone to forming puddles or becoming over saturated.
- Adjust sprinkler heads to minimize spray drift towards public areas or access ways.
- Minimize drift by using large droplet design sprinkler heads where necessary.
- Ensure all non-potable lines and hose bibs are clearly color-coded and marked. Post signage as necessary in English and Spanish to indicate the presence of non-potable water.
- Brief golf course grounds maintenance personnel on the importance of personal hygiene when working on the irrigation system or non-potable water system.

With proper irrigation techniques and precautions, the use of reclaimed water for irrigation is not expected to pose an undue health or safety hazard to the public. The implementation and enforcement of standard construction safety regulations should provide a satisfactory level occupational safety during the construction of the Proposed Action.

4.6 Air Quality

Laughlin AFB is located in an attainment area with the nearest PSD Class I area located ~150-miles west. Since Val Verde County is an attainment area (and is not a maintenance area) for all criteria pollutants, a

conformity determination was not required or performed. Also, since the Proposed Action does not involve the addition or modification of any stationary air emission sources, air-permitting requirements do not apply.

The potential air quality impacts of the Proposed Action would occur during construction and would be temporary in nature. Once construction is completed, air pollution emissions are expected return to existing levels. During construction, emissions of fugitive dust should be controlled as necessary by implementing standard construction control measures (i.e. spraying of water to control dust, proper soil stockpiling, and prompt replacement of ground cover).

Because the Proposed Action will not significantly increase ambient air pollution with any "criteria" pollutants, contribute to an existing violation of any NAAQS, interfere with or delay timely attainment of NAAQS, or impair visibility within any PSD Class I area, it is not expected to have a significant impact on air quality. Under the No-Action Alternative, existing conditions would remain as they are and air quality conditions in the area would not change.

4.7 Biological Resources

This section analyzes the potential for impacts to biological resources under the Proposed Action and No-Action Alternatives. Impacts to biological resources are considered significant if species or habitats of high concern are adversely affected over relatively large areas, or disturbances cause reductions in population size or distribution of a species of high concern.

Except for the Black-Capped Vireo, the project area is not conducive to the roosting, breeding, nesting, or feeding habits of any of the sensitive bird species identified; but it is possible these species may overfly and even temporarily light in the project area. The vast majority of the project area does not impinge on any native roosting or nesting habitat associated with the Black-Capped Vireo.

The Tobush Fishhook Cactus, an extremely rare cactus, has been known to occur in soils native to the project area. According to the Environmental Flight Chief for Laughlin AFB, a recently conducted, base-wide sensitive-species survey identified no endangered or threatened species - including the Tobush

Fishhook Cactus and Black-Capped Vireo. None of these birds or cacti were noted during the site visit, but golf course grounds maintenance personnel report seeing cacti with similar traits.

Prior to construction, the project area should be carefully examined for the cactus, and – if found – protective measures should be implemented. Aside from this cactus, the Proposed Action is not expected to adversely threaten any species or habitats of high concern or impact any relatively large areas of potential habitat.

Irrigation with reclaimed water can result in changes to the soils' electrical conductivity and sodium adsorption ratio, cause an osmotic effect on plants as salts accumulate in the root zone, may have a "sealing" affect on the soils' structure and permeability, and may reduce the need for fertilizer application. The issue of irrigation with reclaimed water is more of an agronomical issue than an environmental issue, calling for adjustments to current turf-management practices.

Since the proposed reclaimed water transmission line will largely follow roadways or pass through the golf course grounds, the vegetation and wildlife likely to be encountered in the project area has already, for the most part, been disturbed by development, human occupancy, grading, replanting, mowing, herbicide treatment, and other grounds maintenance activities. Under the No-Action Alternative, existing conditions would remain as they are and biological resources in the project area would not change.

4.8 Cultural Resources

The NRHP database identifies ten cultural resources for Val Verde County. Of these, four are located in Comstock, two are located in Langtry, three are located within the city of Del Rio (approximately six-miles from the project area), and one is located on private land at an undisclosed location. A base-wide archeological report completed in October 2004 concludes that no archeologically significant resources are located in the proposed project area.

Since there are no cultural resources identified on Laughlin AFB, there would be no adverse impacts associated with the Proposed Action. The project area is focused in an area that has already been

modified by lagoon construction, road construction, grading, and golf course installation. Cultural resources of any significance are likely to have already been identified in the process of these modifications. Although this investigation identified no cultural resources, construction personnel should be alert for artifacts or other items of cultural value. If any such items are unearthed, construction activities should be halted until an archeologist can be called on site, evaluate the findings and implement necessary protective measures.

If the Proposed Action is not implemented, existing conditions would remain as they are and cultural resources in the project area would not change.

4.9 Pollution Prevention

Pollution Prevention encompasses releases to all media: air emissions, wastewater discharges / spills, stormwater discharges, releases to the soil / groundwater, as well as solid and hazardous waste generation. In addition, Pollution Prevention includes other practices that reduce or eliminate the creation of pollutants through increased efficiency in the use of raw materials, energy, water, or any other resources; and / or protect natural resources by conservation.

Excavated soils will largely be reused as backfill, berms or fill. Any excess excavated soils will be provided to the golf course for use in golf course improvements, road base, and general site needs. Because excavated materials will be reused, because demolition is not involved, and because new materials will be used to construct the project; construction of the Proposed Action will not generate any wastes of consequence. Best management practices should be implemented to ensure efficient use of raw materials and minimize waste generation.

Once constructed, wastewater will be discharged via the irrigation system. Because the wastewater will meet TCEQ standards, properly applied irrigation will constitute a conservation measure - not a pollution prevention concern. Application of wastewater is likely to result in a decreased need for fertilizer application to the golf course grounds.

Implementation of the aforementioned precautions for best management practices, erosion / sedimentation controls, and proper irrigation techniques; renders Pollution Prevention concerns inconsequential to this project. If the Proposed Action is not implemented, wastewater would not be conserved by reuse as irrigation water, discharges to the creek would continue, and fertilizer application would remain unchanged.

4.10 Socioeconomics and Environmental Justice

4.10.1 Socioeconomics

The Proposed Action is not expected to impact the population or housing resources of either Laughlin AFB or any surrounding communities. Similarly, although project construction activities may enhance local employment and economic activity, the effect will only be temporary. In the short term, the construction of the Proposed Action would result in secondary employment, but the demand for labor will not trigger the in-migration of workers or their families from outside the area.

The conversion to alternate irrigation water sources will economically benefit Laughlin AFB (by an average of $50,277 per year), but the City of Del Rio will subsequently suffer an equivalent loss in revenue. Currently, the City of Del Rio provides between 14 and 18-million gallons of potable water per day (5.1 to 6.6-billion gallons per year). Assuming equivalent pricing, the Proposed Action, (using an average of 26.9-million gallons per year) will result in 0.5% loss in overall water revenue to the city.

If the Proposed Action is not implemented, the short-term increase in employment and economic activity, the economic benefit to Laughlin AFB, and the revenue loss to the City of Del Rio would not be realized.

4.10.2 Environmental Justice

The civilian areas immediately surrounding Laughlin AFB are not heavily developed and are sparsely populated. The largest nearby civilian population center is located approximately 6-miles away in the City of Del Rio.

Implementation of the Proposed Action is not projected to adversely or disproportionately impact any minority and low-income populations.

With the implementation of the No-Action Alternative, there would be no change in socioeconomic baseline conditions or benefits to minority communities and low-income populations.

4.11 Land Use

The Proposed Action elements are located within developed locations and do not require additional land. The Proposed Action will not result in a conversion of land use in the project area and will not affect adjacent land. No designated prime rangeland, prime farmland, drainage areas, floodplains, wetlands, or hydric soils have been identified within the project area.

With the implementation of the No-Action Alternative, there would, likewise, be no change in land use.

4.12 Noise

Once completed, the Proposed Action would have a negligible effect on ambient noise levels. Construction of the project, however, would have minor, temporary impacts on the noise environment of the immediate project area. The magnitude of the impact cannot be predicted with precision because the specific types of equipment to be used, the methods employed, and scheduling of work are unknown at this time. Use of heavy equipment during construction would generate the intermittent noise typical of construction activities, but would only occur during daylight hours and would persist only throughout the construction phase.

The construction activities will not be conducted near office, hospital, or other noise-sensitive areas, but some excavation activities (near Carlson Street and Vandenberg Street) will be conducted within 100 to 300-feet of residential housing areas. Although construction noise is estimated to be higher than recommended levels, these activities would be short term and intermittent.

Under the No-Action Alternative, existing noise conditions would remain unchanged.

5.0 Cumulative Effects and Irreversible / Irretrievable Commitment of Resources

5.1 Cumulative Effects

Cumulative impact is defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions." Cumulative effects are not wholly different effects from direct or indirect effects of an action. Cumulative effects are merely a way of placing seemingly isolated or insignificant direct or indirect effects in context with respect to overall impacts, both over time and in an area larger than that evaluated for direct and indirect effects.

Cumulative effects are most likely to arise when a relationship or synergism exists between a Proposed Action and other actions expected to occur in a similar location or during a similar time period. Actions overlapping with or in close proximity to the Proposed Action would be expected to have more potential for a relationship than actions that may be geographically separated. Similarly, actions that coincide, even partially, in time would tend to offer a higher potential for cumulative effects.

To identify, cumulative effects, this EA analysis addresses three questions:

- Does a relationship exist such that elements of the Proposed Action might interact with elements of past, present, and reasonably foreseeable actions?
- If one or more of the elements of the Proposed Action and another action could be expected to interact, would the Proposed Action affect or be affected by impacts of the other action?
- If such a relationship exists, does an assessment reveal any potentially significant impacts not identified when the Proposed Action is considered alone?

No perceivable, negative relationship between the Proposed Action and past, present, or foreseeable actions was evident. Any actions that have or that are expected to take place affect very specific operations on the base and would not be expected to result in more than negligible impacts individually or cumulatively, and the combined impacts would remain well below the threshold of significance for any resource category.

5.2 Irreversible / Irretrievable Commitment of Resources

NEPA requires that environmental analysis include identification of "...any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented." Irreversible and irretrievable resource commitments are related to the use of non-renewable resources and the effects that the uses of these resources have on future generations. Irreversible effects primarily result from the use or destruction of a specific resource (e.g., energy and minerals) that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value to an affected resource that cannot be restored as a result of the action (e.g., extinction of a threatened or endangered species or the disturbance of a cultural site).

No irreversible or irretrievable resource commitments of consequence are associated with the Proposed Action. Some limited resources include the consumption of fuel, oil, and lubricants by construction equipment, the electrical energy to operate the Proposed Action elements, and the groundwater pumped from the proposed water well(s). While consumption of these resources would slightly increase, their consumption will not significantly impact the availability of these resources.

ATTACHMENTS

Figure 1 – Vicinity Map

Figure 2 – Project Elements Aerial

Figure 3 – Soil Survey Map

Figure 4 – Flood Map

Figure 5 – USGS Map

Figure 6 – Site Photographs

Figure 7 – AF Form 813

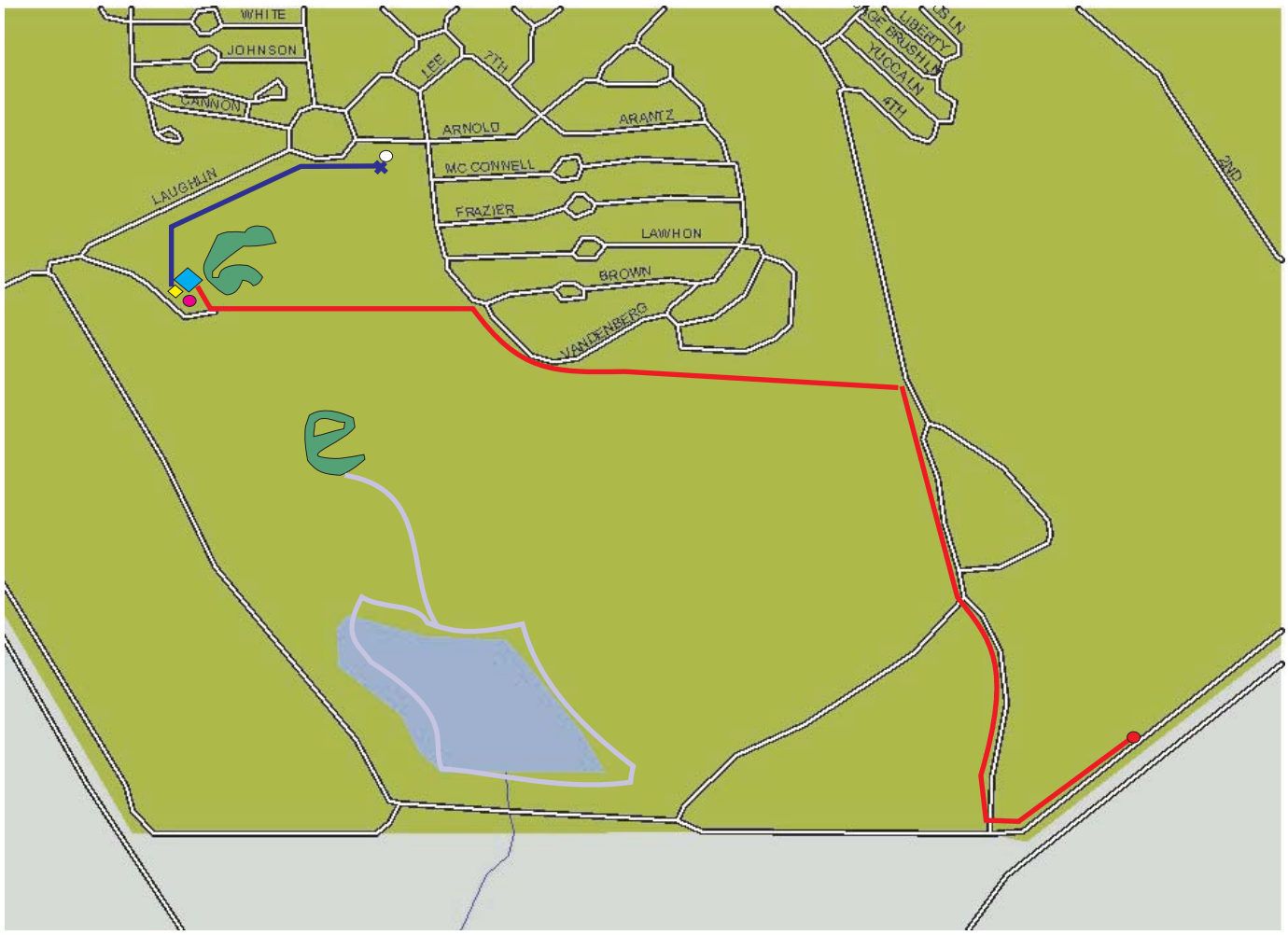

Figure 1

Precision Mapping Software
(Scale Unknown)

N

Vicinity Map

Laughlin AFB Leaning Pine Golf Course
Groundwater and Reclaimed Water Irrigation Project
Laughlin AFB - Val Verde County - Texas

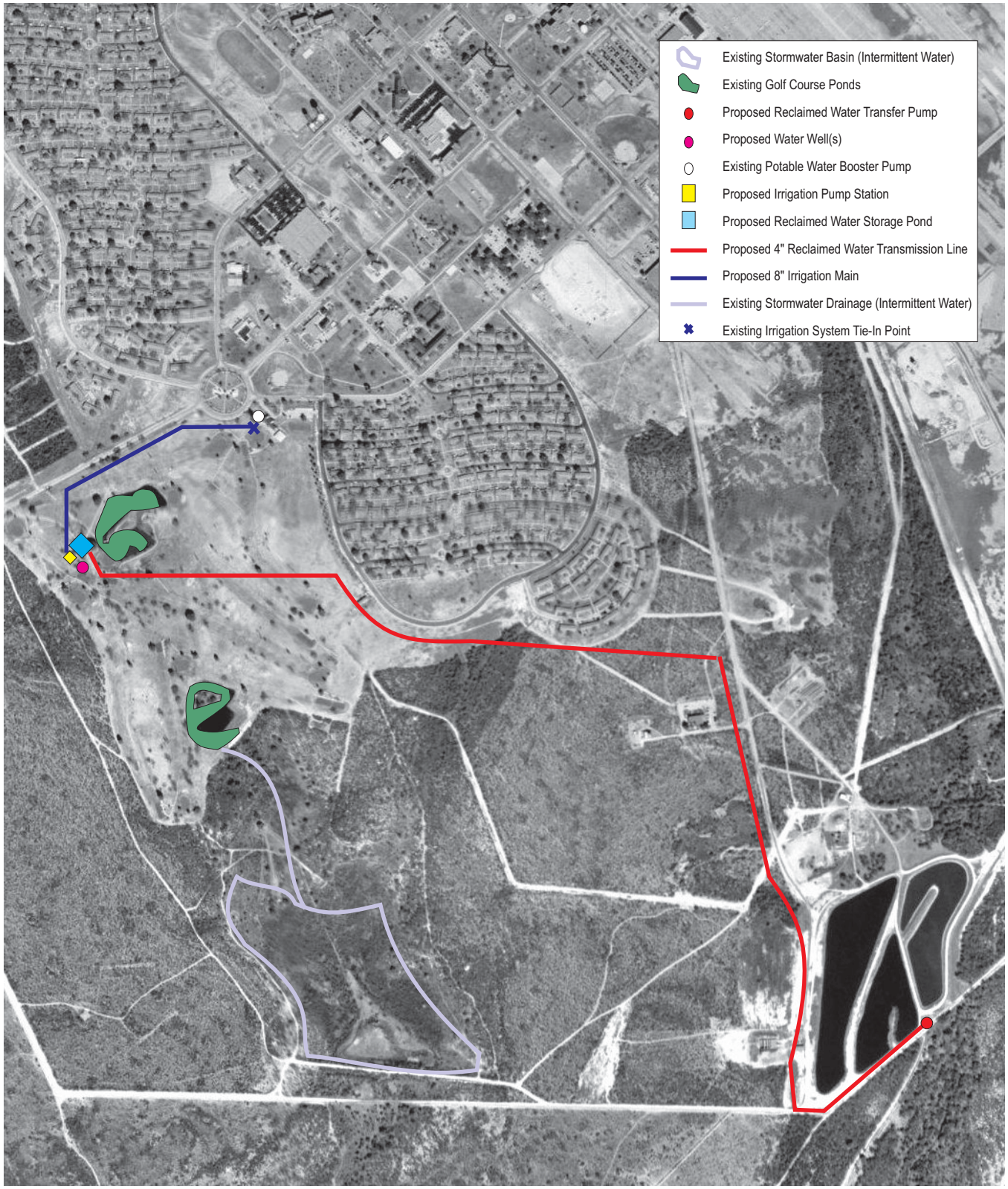

Figure 2

Microsoft TerraServer (2002)
(Scale Unknown)

N

Project Elements Aerial

Laughlin AFB Leaning Pine Golf Course
Groundwater and Reclaimed Water Irrigation Project
Laughlin AFB - Val Verde County - Texas

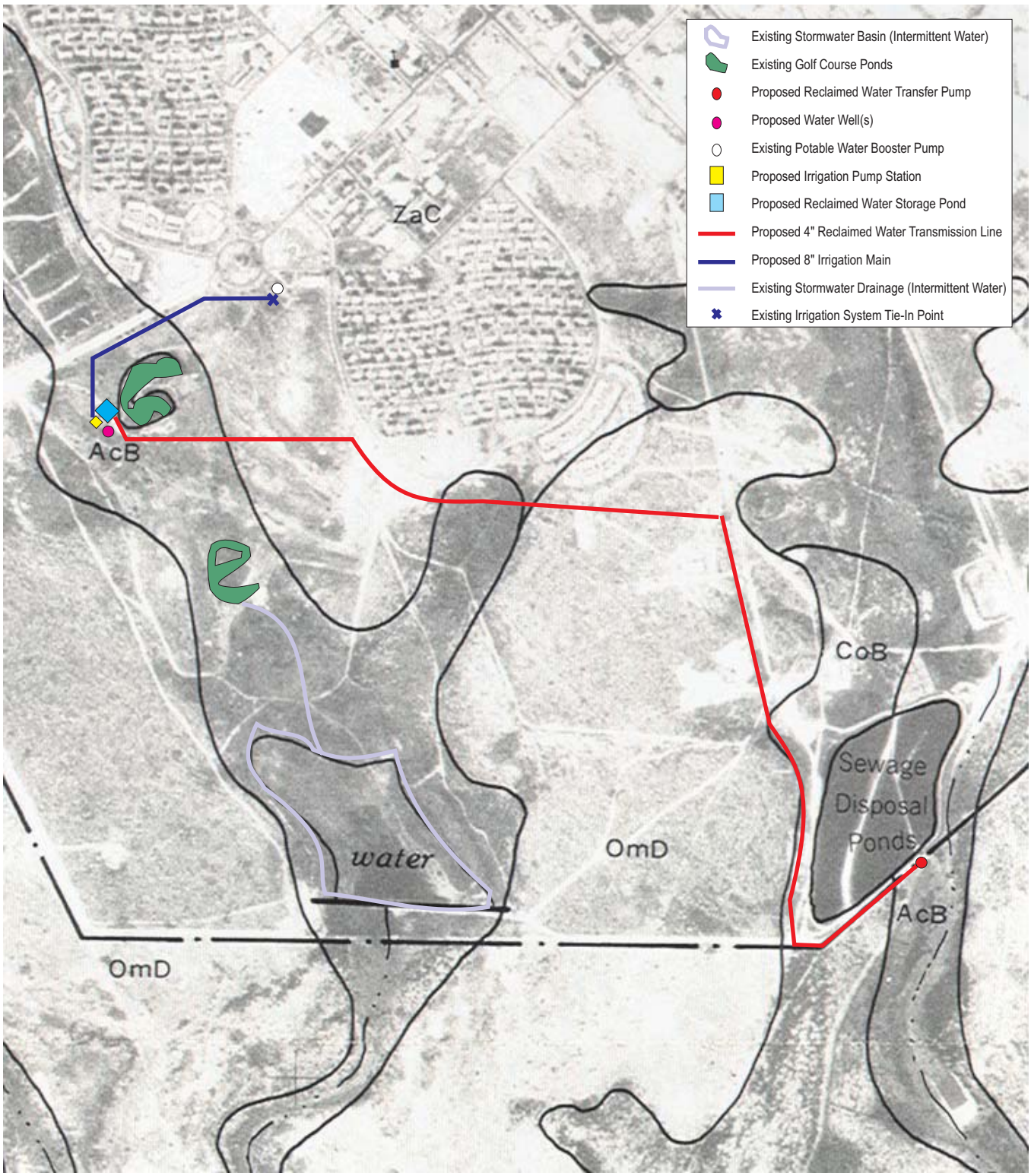

Figure 3

USDA - Soil Survey - Val Verde County, TX
(Scale Unknown)

N

Soil Survey Map

Laughlin AFB Leaning Pine Golf Course
Groundwater and Reclaimed Water Irrigation Project
Laughlin AFB - Val Verde County - Texas

Figure 4

U.S. Department of House & Urban Development
Flood Hazard Boundary Map - Val Verde County, Texas
Panel No. 481187-0037A & 481187-0035A (1978)

N

Flood Map

Laughlin AFB Leaning Pine Golf Course
Groundwater and Reclaimed Water Irrigation Project
Laughlin AFB - Val Verde County - Texas

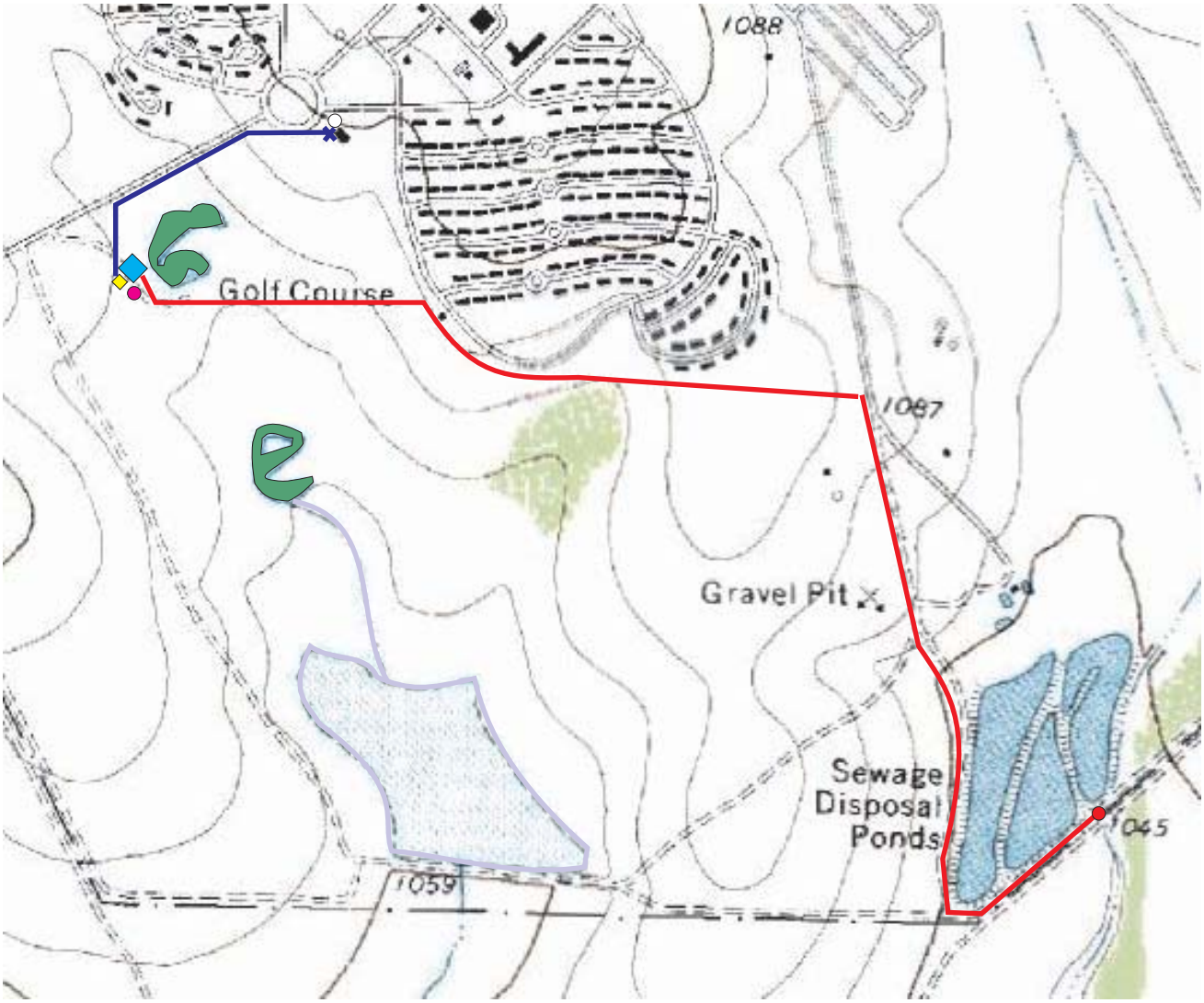

Figure 5

USGS Del Rio SE Quad
(Scale Unknown)

N

USGS Map

Laughlin AFB Leaning Pine Golf Course
Groundwater and Reclaimed Water Irrigation Project
Laughlin AFB - Val Verde County - Texas

Existing potable water connection and booster pump.

Existing potable water irrigation discharge line.

General view of northmost golf course pond from irrigation system compound looking west-southwest.

Turtles inhabit the northmost golf course pond.

South half of the northmost golf course pond.

North half of the northmost golf course pond.

View of grounds in the vicinity of the northmost golf course pond from the west side of the pond looking east-northeast.

View from northmost golf course pond looking east. These are the grounds where the 4-Inch transmission line will run from the northmost pond towards the golf course's east boundary.

View looking east-southeast of the grounds where the 4-Inch transmission line will parallel the golf course's east boundary.

View looking west-northwest along the golf course road where the 4-Inch transmission line will parallel Vandenberg Street.

View looking east along the golf course road where the 4-Inch transmission line will parallel Carlson Street.

View looking north where the 4-Inch transmission line will parallel 4th Street.

Another view looking north
where the 4-Inch transmission line will parallel 4th Street.

View looking north along an unpaved road merging with 4th Street. The 4-inch transmission line will parallel this dirt road.

View looking south along unpaved road bounding the west most wastewater lagoon. The 4-inch transmission line will parallel this road.

Typical unpaved road in project area. Included in case the transmission line route is rerouted to parallel other roads. These roads are routinely sprayed with herbicide to kill vegetation.

Creek discharging from the south end of the southmost golf course pond towards the stormwater retention basin.

Southmost golf course pond. View from the east side looking west.

REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS

Report Control Symbol RCS:

INSTRUCTIONS: *Section I to be completed by Proponent; Sections II and III to be completed by Environmental Planning Function. Continue on separate sheets as necessary. Reference appropriate item number(s).*

SECTION I - PROPONENT INFORMATION

1. TO *(Environmental Planning Function)*	2. FROM *(Proponent organization and functional address symbol)*	2a. TELEPHONE NO.
47 CES/CEV	47 CES/CEO	

3. TITLE OF PROPOSED ACTION

Effluent Reuse Project (Energy Savings Performance Contract FY04)

4. PURPOSE AND NEED FOR ACTION *(Identify decision to be made and need date)*

Reference attached page

5. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES *(DOPAA) (Provide sufficient details for evaluation of the total action.)*

Reference attached page

6. PROPONENT APPROVAL *(Name and Grade)*	6a. SIGNATURE	6b. DATE
CAPT. HARRY JACKSON	Harry Jackson	1 Sep 04

SECTION II - PRELIMINARY ENVIRONMENTAL SURVEY. *(Check appropriate box and describe potential environmental effects including cumulative effects.) (+ = positive effect; 0 = no effect; - = adverse effect; U= unknown effect)*	+	0	-	U
7. AIR INSTALLATION COMPATIBLE USE ZONE/LAND USE *(Noise, accident potential, encroachment, etc.)*	☐	☒	☐	☐
8. AIR QUALITY *(Emissions, attainment status, state implementation plan, etc.)*	☐	☒	☐	☐
9. WATER RESOURCES *(Quality, quantity, source, etc.)*	☒	☐	☐	☐
10. SAFETY AND OCCUPATIONAL HEALTH *(Asbestos/radiation/chemical exposure, explosives safety quantity-distance, bird/wildlife aircraft hazard, etc.)*	☐	☐	☐	☒
11. HAZARDOUS MATERIALS/WASTE *(Use/storage/generation, solid waste, etc.)*	☐	☒	☐	☐
12. BIOLOGICAL RESOURCES *(Wetlands/floodplains, threatened or endangered species, etc.)*	☐	☒	☐	☐
13. CULTURAL RESOURCES *(Native American burial sites, archaeological, historical, etc.)*	☐	☒	☐	☐
14. GEOLOGY AND SOILS *(Topography, minerals, geothermal, Installation Restoration Program, seismicity, etc.)*	☐	☒	☐	☐
15. SOCIOECONOMIC *(Employment/population projections, school and local fiscal impacts, etc.)*	☐	☒	☐	☐
16. OTHER *(Potential impacts not addressed above.)*	☐	☒	☐	☐

SECTION III - ENVIRONMENTAL ANALYSIS DETERMINATION

17. ☐ PROPOSED ACTION QUALIFIES FOR CATEGORICAL EXCLUSION (CATEX) # _____ ; OR
☒ PROPOSED ACTION DOES NOT QUALIFY FOR A CATEX; FURTHER ENVIRONMENTAL ANALYSIS IS REQUIRED.

18. REMARKS

The proposed project requires an Environmental Assessment due to the size and potential complexity of the project.

19. ENVIRONMENTAL PLANNING FUNCTION CERTIFICATION *(Name and Grade)*	19a. SIGNATURE	19b. DATE
Ramon E. Flores	Ramon E. Flores	2 SEP 04

DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

DESCRIPTION OF PROPOSED ACTION:
Project goal is to provide a complete golf course irrigation system using groundwater and wastewater effluent water sources. Project will involve all labor, equipment, and materials to construct a wastewater plant effluent reuse infrastructure, groundwater extraction system and the associated holding pond structure.

REQUIREMENT:
Provide adequate system to fully irrigate golf course using a groundwater source and wastewater treated effluent source.

CURRENT SITUATION:
Potable water is being used to irrigate the golf course and is very costly.

IMPACT IF NOT PROVIDED:
No action to provide groundwater source or treated effluent for this project.