Border Environment Cooperation Commission
Stormwater Project in El Paso, Texas

1. General Criteria

1.a Project Type

Project Name:	Stormwater Drainage Project in El Paso, Texas
Project Sector:	Wastewater – Stormwater Drainage

1.b Project Category

Category:	Community Environmental Infrastructure Project – Community-wide impact

1.c Project Location and Community Profile

Community:	City of El Paso, Texas, United States.
Location:	The Project will be developed within the city of El Paso and surrounding areas in the Extended Territorial Jurisdiction (ETJ), located in the western part of the State of Texas. El Paso is situated in the Chihuahuan Desert and borders south with the City of Ciudad Juarez, Chihuahua, Mexico; the City of Sunland Park, New Mexico to the west, and Hudspeth County, Texas, to the east. The City of Las Cruces, New Mexico, is approximately 45 miles to the north.
Location within the border:	The project is located within the 62.5 mi (100 km) of the US-Mexico border area.
Figure:	Figure 1.1 below shows the location of the City of El Paso, TX.

Figure 1.1 Location of El Paso, Texas.

Demographics

Current population:	742,062 residents
Growth rate:	9.2 %
Reference:	
Economically active population:	255,667 residents
Reference:	US Census Bureau, Year: 2008
Median household income:	$35,116
References:	US Census Bureau , Year: 2007
Economic activity:	Commerce
Marginalization rate:	23.4

Services

Community:	El Paso, Texas
Water System	
Water coverage:	99%
Water supply source:	Surface water (Rio Grande) and groundwater (Hueco and Mesilla Aquifers)
Number of water hookups:	183,791

Wastewater Collection System

Wastewater collection coverage:	96%
Number of sewer connections:	174,662

Wastewater Treatment

Wastewater treatment coverage:	98%
Wastewater Treatment Plants (WWTP) and treatment technologies:	- Haskell R. Street WWTP Conventional Activated Sludge Process - Roberto R. Bustamante WWTP Conventional Activated Sludge Process - Northwest WWTP Conventional Activated Sludge Process - Fred Harvey Water Reclamation Plant Powdered Activated Carbon Activated Sludge Process

Stormwater Drainage System

Stormwater pump stations:	16
Dams:	38
Detention/Retention ponds:	270
Open channels:	103 miles
Agricultural drains:	48 miles
Storm drain conduits:	More than 500 miles
Storm drain inlets:	4,100

Street Paving

Street paving coverage:	99.9%

1.d Legal Authority

Project applicant:	Public Service Board (PSB). The Municipal Drainage Utility System (MDUS) will be responsible for the management of the project.
Legal representative:	Bob Andron
Legal instrument to demonstrate legal authority:	City of El Paso Ordinance
Date of instrument:	The MDUS was created in July 19, 2007
Compliance with agreements:	- 1889 International Boundary Convention - 1944 Water Treaty - 1983 La Paz Agreement, or Border Environment Agreement - 1990 Integrated Border Environmental Plan (IBEP)

- 1994 North American Free Trade Agreement (NAFTA)
- Border 2012 Program

1.e. Project Summary

Project description and scope:

The project consists of the rehabilitation of the stormwater drainage infrastructure in the City of El Paso, including canal lining with concrete, raising and enlarging of stormwater embankments and ponding areas, upgrading and replacements of pump stations, diversion works and collection piping and repairs of dams and ponding areas.

The overall project includes the following 15 components:

1. Government Hills System (Government Hills Inlets)
2. Government Hills System (Government Hills Crossings)
3. Cebada System (Cebada Clearance of Utilities)
4. Cebada System (Cebada Pump Station and Force Main Phase 1)
5. Government Hills System (Van Buren Dam Improvements)
6. Lomaland Basin (Lee Trevino Improvements)
7. Basin G (Basin G Improvements)
8. Mesa Drain (Mesa Drain Improvements)
9. Range Dam (Electric Ditch Improvements)
10. Doniphan Ditch System (Doniphan Ditch Phase 1)
11. Cebada System (Cebada Force Main Phase 2)
12. Northeast Ponding System (NE Channel 2 Improvements)
13. Cebada System (Cebada Pump Station Phase 2)
14. Mesa Drain (Mesa Drain Phase 2)
15. Doniphan Ditch System (Doniphan Ditch Phase 2)

Population served: 742,062 residents

Number of connections served: Not applicable

Project cost: $67.5 MD

Project map: Figure 1.2 below shows the location of the proposed improvements in the project area.

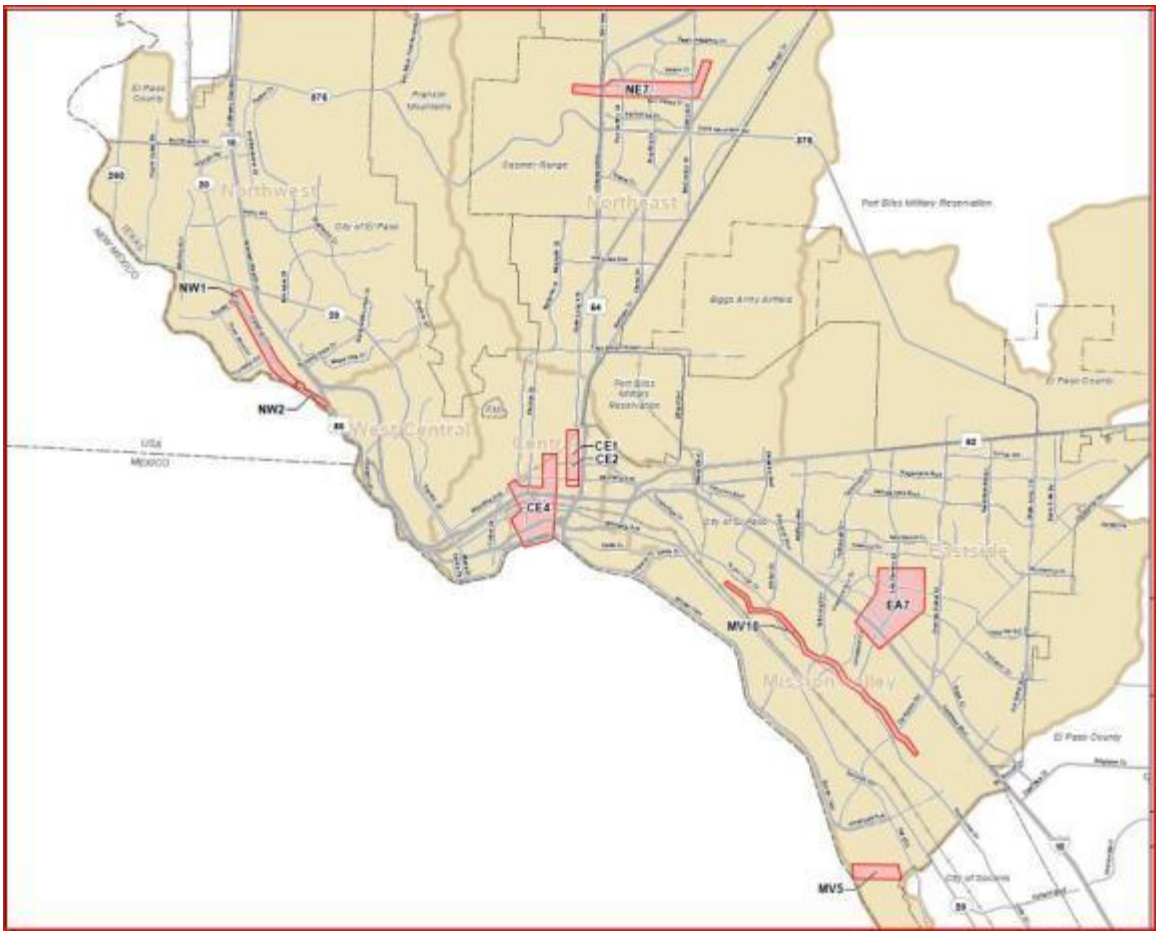


Figure 1.2 Projects Location.

1.f Project Justification

Project justification: The purpose of this project is to improve the quality of life of residents of the City of El Paso by preventing potential life-threatening flooding as well as protecting the environment and existing infrastructure.

The project's implementation would bring about the following benefits:

- Preventing floods that threaten the life of residents caused by heavy rains, and thereby enhance public safety and protect human life.

- Provide sufficient capacity to retain stormwater and prevent failures of dams, levees, or other structures that are impounding water.

- Prevention of future flooding and potential structural damage to 8,932 households.

- Improve quality of life by reducing sources of pollution as a result of the stagnation of stormwater on streets near to public.

- Assure residents mobility in case of emergencies.

- Prevent loss or damages to environmental infrastructure. It is estimated that damages would not exceed $2.5 MD in repairs in a year due to heavy rains.

- Set in motion climate change adaptability initiatives.

- Lessen erosion in the project area.

- Recharge of aquifer by infiltration of about 30% of the accumulated stormwater in the proposed infrastructure.

- Lessen silt transport into the Rio Grande river due to the uncontrollable flooding, affecting both sides of the border.

- Protect the neighbor city of Ciudad Juarez, Chihuahua from flooding and overflows.

In late July and early August 2006, the city of El Paso and surrounding regions experimented severe rainstorms. Over a period of three days, some areas received cumulative rainfall in excess of 7 inches. This exceeded the average rainfall of the entire year for El Paso. The resulting storms runoff was of a volume and intensity that exceeded the capacity of several segments of the city's drainage system. The stormwater infrastructure evaluated by URS Corporation noted inefficiencies in various nodes and links in the system. For instance, a channel was to have a 100-year storm capacity but the crossing was undersized only passing 10-year storm flows. Deficiencies in dams released outflows flooding and damaging channels, conduits and nearby properties. Also, pumps stations were found to have electrical and mechanical malfunctions, requiring upgrades and/or increasing capacity. Furthermore, the city's streets and conduits were burden by debris, sediment and silt transport, clogging making an inoperable system. Several retention ponds in West El Paso nearly overflowed and there were no safety spillways meaning a catastrophic release could have occurred. Levees of the Rio Grande River were put at risk of failure. Failure of hydraulic structures caused by peak discharge jeopardized residents' lives and caused loss of properties and infrastructure. All of these deficiencies were reported in the Stormwater Master Plan.

In addition, as a result of the Storm 2006, the wastewater infrastructure was damaged. Sanitary sewer collection system had to be immediately repaired. A water treatment plant was shut down during and after the flooding until the flood waters receded and the plant could operate normally. Wastewater treatment plants were hydraulically overloaded during and after the flood until all high waters receded.

It is expected that this type of events would be more recurrent in the future due to the climate change experienced as a result of the global warming of the planet. These projects are and will be needed to face these extreme events in the future.

Figure 1.3 illustrates a few of the Storm 2006 disasters.

Figure 1.3 Storm 2006 disasters.

Urgency of the project or consequences of no action:

The lack of an adequate stormwater drainage system jeopardizes the life and health of area residents. High precipitation intensity in the project area can result in significant surface runoff as the paved ground cannot absorb the water at the rate required and the rainfall rate exceeds the ground surface's infiltration capacity. Rapid inundation of the area may be caused by these events. The adverse human health consequences of flooding are complex and far-reaching.

In addition, inadequate stormwater drainage can contribute to water contamination resulting in epidemics of waterborne and arboviral diseases.

While El Paso Storm 2006 and the associated impacts were significant in their own right, the event by itself and the ensuing analyses demonstrated a broader risk to the community. Many areas not impacted by heavy rains of Storm 2006, were equally at risk for future damage. Furthermore, flood risk may be experienced—in fact it has been felt historically—by lesser storm events.

The impact of Storm 2006 is an example of the damage that can result from a large storm event coupled with undersized stormwater infrastructure that is not functioning properly. The Storm 2006 floods in the city caused over $250 million dollars in infrastructure damages not considering losses of houses, etc. It is estimated that no more than $2.5 MD would be spent for infrastructure repairs in a future disaster with this project.

Figure 1.4 illustrates polluted standing stormwater caused by inadequate stormwater drainage system.

Figure 1.4 Polluted standing stormwater

Prioritization Process category:	Not applicable

Pending Issues:

None

Criterion Summary:

The project falls within BECC priority sectors and meets basic general criteria.

2. Human Health and Environment

2.a Compliance with Applicable Environmental Laws and Regulations.

Environmental and Public Health needs to be addressed by the proposed project:

- The lack of an adequate stormwater drainage system jeopardizes the life and health of area residents. The adverse human health consequences of flooding are complex and far-reaching which include drowning and physical injuries. Approximately 8,932 households would be directly benefited from project implementation while reducing their high risk of flooding.
- The inappropriate stormwater drainage can contribute to water contamination by having standing stormwater accumulated on the streets and that has nowhere to go, potentially resulting in waterborne and arboviral diseases.
- The implementation of the project will allow the recharge of the Hueco Aquifer by retaining about 30% of the stormwater accumulated in retention structures.
- The project will set in motion climate change adaptability.
- Potential damages to environmental infrastructure would be prevented by having an adequate stormwater drainage system that can retain stormwater at the rate required. It is estimated that no more than $2.5 MD would be spent for infrastructure repairs in a future disaster with this project.
- Lessen erosion and sedimentation in the project area.
- Reduction of silt transport into the Rio Grande River.

The project meets the following applicable environmental laws and regulations:

- The project complies with Texas Administrative Code, Title 30, Part 1, Chapter 299 (§299.16) Dams and Reservoirs.
- The project will comply with the PSB-El Paso Water Utilities Municipal Separate Storm Sewer System Permit (MS4) issued by the Texas Commission on Environmental Quality (TCEQ).
- Stormwater Management Plan was approved by the TCEQ simultaneously with the MS4 Permit.
- For projects involving excavation or construction of detention structures, a depth of no more than 20 feet was

recommended to be in compliance with regulatory requirements for the City of El Paso Code.

- In addition, coordination and approval of the following agencies is required for the development of the project:
  - Texas Commission on Environmental Quality (TCEQ)
  - U.S. Environmental Protection Agency (EPA)
  - Texas State Historic Preservation Office (TXSHPO)
  - U.S. Army Corps of Engineers (USACE)
  - US Fish and Wildlife
  - Texas Parks and Wildlife
  - U.S. and Mexican International Boundary and Water Commission (IBWC, CILA by its initials in Spanish)

2.b Human Health and Environmental Impacts.

Human Health Impacts

Direct and indirect benefits:

- Prevent life-threatening floods caused by heavy rains events to enhance public safety and protection of human life. The implementation of the project could prevent flooding for approximately 8,932 households.
- The project would reduce transmission of waterborne and arboviral diseases caused by the lack of appropriate stormwater drainage system.
- The project would reduce human contact with potential contaminated standing stormwater.

Health statistics:

- Waterborne and arboviral diseases are secondary effects of floods.
- Waterborne diseases are caused by pathogenic microorganisms that are directly transmitted as a result of inadequate disposal of stormwater and wastewater, as well as the practices of unsafe water supplies. An individual may become ill after being in contact with water that has been contaminated with these organisms. Waterborne diseases may be caused by protozoan, viruses, bacteria, and intestinal parasites.
- Arboviral diseases are caused by a variety of viruses that are transmitted by arthropods (e.g. mosquitoes, sandflies, ticks). Arboviral diseases include West Nile virus, dengue, yellow fever, and other less common infections.

- In the past few years, several cases of waterborne and arboviral diseases were reported to the County of El Paso.

Supporting figures: The following table shows waterborne and arboviral diseases for the County and City of El Paso, TX provided by El Paso City-County Health and Environmental District in their Notifiable Conditions Report for the past five years.

Table 2.1 Waterborne and Arboviral diseases in El Paso, Texas

No. of Cases					
Disease	**2005**	**2006**	**2007**	**2008**	**2009**
Amebiasis	0	3	0	2	1
Botulism, wound	0	1	0	2	0
Campylobacteriosis	20	42	42	24	7
Cryptosporidiosis	1	1	2	6	0
Cyclosporiasis	0	0	0	0	0
Dengue	0	0	0	0	0
Drowning/near drowning	1	4	2	1	0
Escherichia coli, enterohemorrhagic	0	1	1	1	0
Hepatitis A (acute)	37	18	15	22	5
Malaria	0	1	0	1	0
Poliomyelitis, acute paralytic	0	0	0	0	0
Salmonellosis	70	97	119	122	20
Typhoid Fever	0	0	1	0	0
Vibrio infection, including cholera	0	0	0	0	0
West Nile Virus – Fever	0	0	0	6	0
West Nile Virus – Neuroinvasive	0	1	27	18	0

Environmental Impacts

Direct and indirect benefits:

- The proposed improvements will reduce environmental risks associated to the inadequate stormwater drainage system. The proposed project will assist the sponsor collect and dispose stormwater generated in the project areas in compliance with existing federal and state laws and other regulations.

- The project consists of rehabilitation and improvements to existing facilities. The proposed project is anticipated to have no impact on the ecosystem, the flora, fauna and on animal migration routes. No new footprints are expected and therefore no environmental analysis is required. Should any historical and/or archaeological

remains be found, it is standard procedure to stop all construction activities and contact the appropriate agencies for further guidance.

- Proposed project will help to significantly improve the level of protection of the existing infrastructure, considering that the average storm capacity is 9-year-storm. The storm capacity of all 15 components of the project will increase to more than 100-year-storm.

- Potential damages to environmental infrastructure would be prevented by having an adequate stormwater drainage system that can hold up stormwater at the rate required. Existing infrastructure will be improved to be able to impound stormwater adequately to avoid damages to environmental infrastructure as experienced in the summer of 2006. In Storm 2006, a water treatment plant had to be shut down due to back-water of the river going into the plant, and the serious damages reported to pavement and sewer collection system. It is estimated that no more than $2.5 MD would be spent for infrastructure repairs in a future disaster with this project.

- In addition, sedimentation from the mountains in the area caused several damages to the environment and existing infrastructure. The lack of proper sedimentation ponds resulted in the inability for sedimentation to settle which facilitated the erosion of channels, and the destruction of properties, streets and environmental structures.

- The project would reduce potential contamination of standing stormwater, considered a secondary effect of flooding.

- The implementation of the project will influence the recharge capacity of reservoirs up to 384 ac-ft. In addition, the project will reduce the amount of stormwater, potentially contaminated by oils and grease from streets, which would be discharged into the Rio Grande.

- The project will set in motion climate change adaptability. A new report by *Environment Texas* finds that storms with heavy rainfall occur with a 61% higher frequency in El Paso than they were 60 years ago. In addition, the Fourth Assessment Report of the Intergovernmental Panel of Climate Change (IPCC) mentions that studies project widespread increases in intense precipitation, with greater risks of not only

flooding from intense precipitation but also droughts from greater temporal variability in precipitation. The implementation of the proposed project will assist the area to cope with extreme projected changes in precipitation, which are larger than changes in the mean precipitation. Having an adequate stormwater infrastructure, the project area will be able to properly impound water in intense precipitation events as well as to be able to recharge Hueco Aquifer for its use in droughts seasons.

- The project would reduce soil contamination, erosion and sedimentation.

- Figure 2.1 shows several damages by the lack of adequate stormwater infrastructure in El Paso.

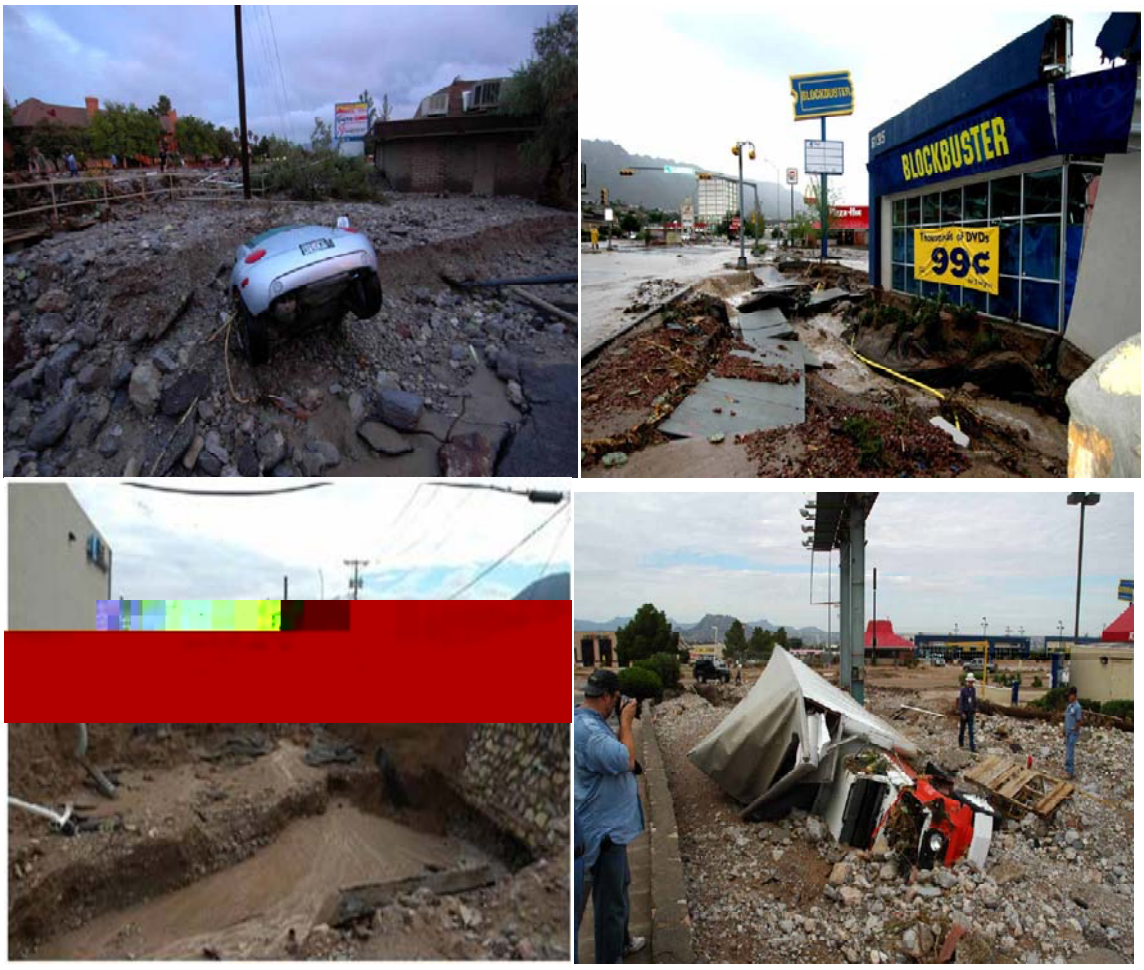


Figure 2.1 Storm 2006 Disasters

Environmental impacts:	The improvements included in the 3-year Capital Improvements Plan will provide environmental benefits, and it is expected that there will be no adverse effects resulting from the improvements. The projects are all aimed at improving the conveyance of stormwater through the city. Potential impacts include the following: <u>Construction Phase</u> - Fugitive dust emissions - Air pollutant emissions from construction machinery - Temporary roadway blockages, presence of workers in the area
Mitigation measures:	Mitigation measures include: - Application of treated wastewater to reduce fugitive dust emissions - Vehicle tune ups to reduce emissions - Placement of warning signage to prevent potentially hazardous situations
Impacts:	The environmental impact resulting from the project implementation will be positive overall, given that: - The project will increase stormwater drainage efficiency, in addition to reducing environmental contamination and will improve the quality of life of area residents by curtailing potential health and life hazards. - The proposed improvements would prevent future damages to current environmental infrastructure and prevent erosion and sedimentation of the area. - The project will promote initiative for climate change adaptability. - Recharge the Hueco Aquifer by retaining about 30% of the stormwater accumulated in retention structures.
Transboundary Impacts	
	- Due to the proximity of the City of El Paso with various communities such as Sunland Park, NM and Ciudad Juarez, Chih., there are frequent border crossings between cities. The construction of the proposed project will have a direct positive impact on the health of residents of these cities and the entire region, since these actions will reduce the risk of

	propagation of waterborne diseases caused by the inappropriate stormwater drainage system. Furthermore, the project will reduce human contact with stalled stormwater. - The implementation of the project would reduce risks for the neighbor city, Ciudad Juarez, by impeding silt transport into the Rio Grande as well as the water that should be discharged. - During the construction of a component there might be a need to lower the water table to facilitate excavation. The discharge of this groundwater during dewatering will require approval by El Paso County Water Irrigation District No.1 (EPCWID) under an existing agreement. The dewatering permit will be requested by the Contractor and includes the method of dewatering, the volume and quality (salinity) of the groundwater to be discharged which will determine the discharge fees assessed by EPCWID. - In a coordination meetings held on June 6 and July 31, 2009 with the IBWC, the IBWC determined that they will coordinate with the CILA on any transboundary issues related to impacts to the Rio Grande River. In accordance with the IBWC process, the sponsor will submit the final designs of the project components for review and comments of IBWC in order to provide the necessary permits.
Formal Environmental Clearance	
Environmental Clearance:	- Projects that consist of improvements to the existing stormwater infrastructure may not require environmental clearance. - Projects that involve improvements to structures that outfall into the Rio Grande River will require a new license from the IBWC. In order to obtain new license the IBWC requires coordination with Texas State Historic Preservation Office, U. S. Army Corp of Engineers, Texas Commission on Environmental Quality, U.S. Fish and Wildlife, and Texas Parks and Wildlife. A consultation letter to each agency will be sent to request clearance. This consultation will be done once the respective final design of each component is completed. - A permit issued by the EPCWID No.1 is needed given that the American Canal is operated by them and is the point of discharge of three of the components. Acquisition of permit is in process.

- The coordination with IBWC began on June 6, 2009 and will be ongoing as the final designs are submitted for review and approval.

Pending Issues

None

Criterion Summary:

The project complies with BECC's Human Health and Environment Criteria

3. Technical Feasibility

3.a Technical Aspects

The project consists of construction and rehabilitation of the stormwater drainage infrastructure in the city of El Paso, including the improvement of 25 miles of conveyance systems, raising and enlarging stormwater embankments and ponding areas, upgrading capacity from an existing 425 cfs to 1205 cfs of pump stations, diversion works and collection piping, and rehabilitation of dams and ponding areas, in order to reduce the flood risk to the public and private property by focusing its attention on areas where flood risk is particularly high.

Project Development Requirements

Design criteria:

The Stormwater Master Plan project (SMP) was developed pursuant to the Drainage Design Manual (DDM) recently adopted by the City of El Paso. The standards and criteria found in the DDM are minimum standards required to prevent new development from negatively impacting the flood risk meaning that runoff will not be increased onto other properties. All improvements included in the 3-year CIP will be completed using standard construction techniques. In addition, all final designs will conform to the criteria specified in the City of El Paso Engineering Department DDM.

For the purpose of the project, the project was divided into components based on the watersheds. A description of the improvements for each of the components is presented in Table 3.1.

Table 3.1 Project Description

System (Project Components)	Issue to be addressed	Description of Improvements
Government Hills System (1. Government Hills Inlets)	Multiple street intersections along Government Hills Channel do not have sufficiently sized drainage inlets. Undersized inlets restrict water from entering the channel and contribute to localize flooding at the crossings.	Expand the street inlets at Altura, Hastings, Cambridge and Cumberland to allow street flow to enter the channel without flooding surrounding properties.
Government Hills System (2. Government Hills Crossings)	Multiple culverts along Government Hills Channel are undersized and contribute to channel flooding in localized areas.	Enlarge culverts at Cambridge, Cumberland, Chester and Trowbridge to increase the overall capacity of the Government Hills Channel to convey the 100-year storm.

Cebada System (3. Cebada Clearance of Utilities)	Conveyance problems through Cebada Reservoir and Magnolia systems cause major flooding on I-10 and on Cebada Road.	Clearing and relocating of existing utilities in Cebada Outfall Conduit (in progress). Expansion of Magnolia Reservoir (in progress)
Cebada System (4. Cebada Pump Station and Force Main Phase 1)	Conveyance problems through Cebada Reservoir and Magnolia systems cause major flooding on I-10 and on Cebada Road.	Storm Drains From Magnolia, Pump Station and Force Main to Rio Grande and pond
Government Hills System (5. Van Buren Dam Improvements)	Van Buren Dam -Upgrade	Modify the outlet structure and increase the height of the dam.
Lomaland Basin (6. Lee Trevino Improvements)	Runoff flooding streets because it does not enter Jesuit Basin effectively.	Addition of 36" RCP, 48" RCP, 60" RCP and 10'X4' CBC storm drain system to capture flows from residential and commercial areas before flooding at Lee Trevino and James Watt
Basin G (7. Basin G Improvements)	The current configuration and capacity of Basin G is causing tailwater to significantly restrict the capacity of the major drains and Interceptor System in Mission Valley. There is a need for additional storage in Basin G.	Excavate existing Basin G area, replace the undersized crossings at Carl Longuemare and Southside, and re-grade the Franklin Drain Interceptor so that water will flow to the basin from both the Playa Drain and the Interceptor System.
Mesa Drain (8. Mesa Drain Improvements)	Mesa Drain is significantly undersized	Expand Mesa Drain 20 feet in width on the south side of the channel where feasible. Also, line portions of channel with concrete that cannot be expanded and line 20 ft upstream of all crossings with concrete
Range Dam (9. Electric Ditch Improvements	Flows in Fairbanks bypasses the entrance to Electric Ditch Channel resulting in downstream flooding of Alcan	Construction of cross sectional inlets and improvement of Electric Ditch
Doniphan Ditch System (10. Doniphan Ditch Phase 1)	This section of Doniphan Ditch is severely undersized with undersized crossings.	Increase the capacity of 3 culvert crossings. Increase the capacity of the channel to detain some volume. Grade the section north of Sunset Dr. to drain to White Spur Drain.
Cebada System (11. Cebada Force Main Phase 2)	Conveyance problems through Cebada Reservoir and Magnolia systems cause major flooding on I-10 and on Cebada Road.	Storm Drains From Magnolia, Pump Station and Force Main to Rio Grande, expand pond
Northeast Ponding System (12. NE Channel 2 Improvements)	Northeast Channel No. 2 is significantly undersized (<10 year) with undersized crossings and serious erosion problems.	Expansion and lining of remaining channel
Cebada System (13. Cebada Pump Station Phase 2)	Conveyance problems through Cebada Reservoir and Magnolia systems cause major flooding on I-10 and on Cebada Road.	Storm Drains From Magnolia, Pump Station and Force Main to Rio Grande, and expand pond

Mesa Drain (14. Mesa Drain Phase 2)	Mesa Drain is significantly undersized	Expand Mesa Drain 20 feet in width on the south side of the channel where feasible. Also, line portions of channel with concrete that cannot be expanded and line 20 ft upstream of all crossings with concrete
Doniphan Ditch System (15. Doniphan Ditch Phase 2)	This section of Doniphan Ditch has 5 undersized crossings and the channel is undersized. There is a known sediment issue.	Increase the capacity of 3 culvert crossings and 2 bridges. Increase the capacity of the channel to detain some volume. Construct a sedimentation basin.

The sponsor is including Green Infrastructure Design (GID) techniques as design considerations for the 15 projects in the SMP. Part of the design guidance provided to the Engineer by the sponsor includes the use of feasible "Green" techniques and cost-effective design such as porous/semiporous products. It is important to note that several GID techniques used in regions with arid climates may be applicable to the El Paso Region. The GID practices include vegetated infiltration systems, streambank bioengineering, swale and buffer strips, porous paving systems, greenways and infiltration systems, stormwater ponds and wetlands, low flow channels, grade control/drop structures and underground detention and retention for specific improvements.

Thick concrete linings are to be used only if the design Engineer demonstrates that such heavy armoring is necessary to combat the high turbulence and velocities of the channeled stormwater. Stormwater infrastructures (dams, basins, channels, etc,) are restricted areas and are fenced to prevent access by the public.

The dams and reservoirs will be designed to foster infiltration of stormwater into the soil and replenishment of the groundwater aquifer. The floor elevations will allow for a high degree of infiltration. Sufficient distance will exist between the bottom of the infiltration system basin and the seasonally high ground water table, to reduce the risk of contamination. In accordance with the design requirements the project will include the five basic categories for infiltration basins: pre-treatment, treatment, conveyance, maintenance reduction and landscaping.

Appropriate Technology

Assessment of alternatives:

As part of the project's development, the alternatives considered for the Stormwater Master Plan for El Paso, Texas, were evaluated based on the following qualitative parameters:

- Constructability
- Ease of maintenance
- Reliability
- Right-of-Way
- Safety
- Aesthetics
- Dual use
- Natural systems

A single alternative was selected for each project. The selection of each alternative was based on:

- Issue addressed by each project
- Type
- Cost
- Location
- Level of flood protection provided
- Qualitative factors
- Most favorable alternative for each project

In the case of large projects, in excess of $5 to $10 million in estimated cost, projects were divided into phases. Early phases were chosen based on substantive improvements in safety and protection at relative low cost.

Based on this method of alternative selection, the Stormwater Master Plan identified 99 components with a total estimated cost of $550 million. Therefore a prioritization process was developed to identify the major concerns associated with the stormwater management. From this prioritization process the 15 components were selected for certification.

Property and Right-of-Way Requirements

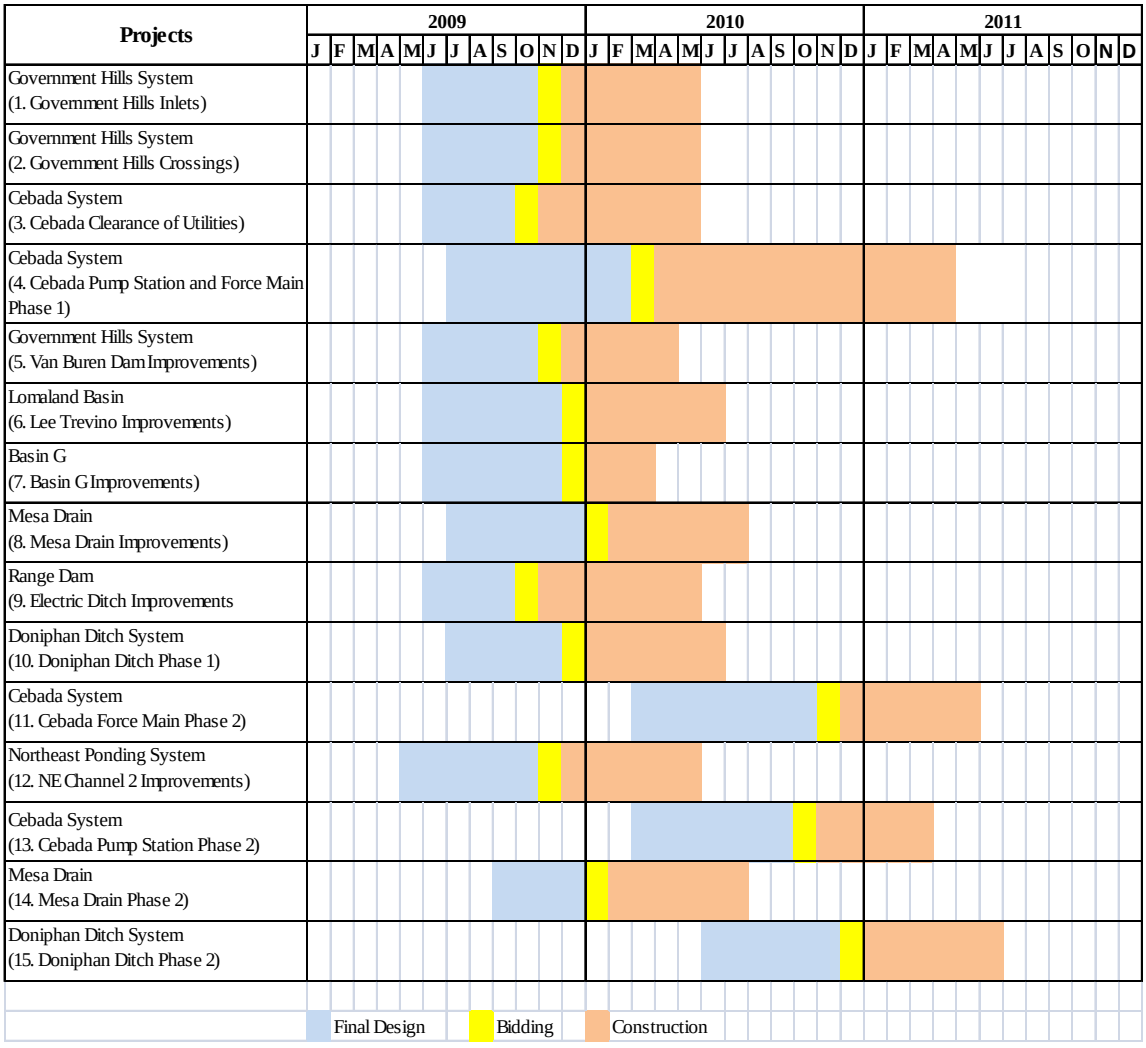
Requirements:

- Land acquisition and right-of-way requirements have been met for all of the components except for the Cebada Pump Station project. Sites for the Cebada Pumping Station have been identified within the urban area. The sponsor is in the process of acquiring the land which is expected to be secured in accordance with the design scheduled by November 2009.

- Stormwater Master Plan indicated that there was a possible acquisition of land for the Doniphan Ditch Improvement project. This is not required to complete the project but may enhance the project.

Project Tasks and Timelines

Table 3.2 Project Schedule



3.b Management and Operations

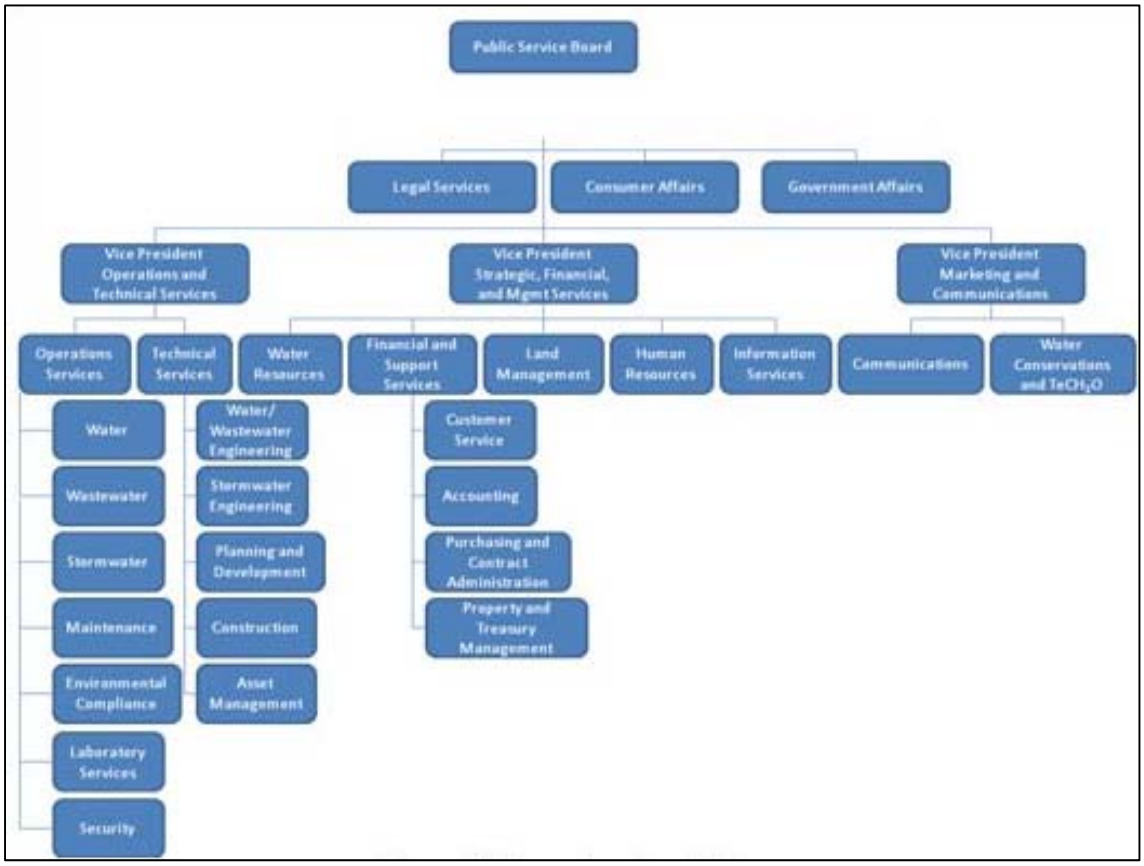


Figure 3.1 Organizacional Chart

Project Management

Resources: The management, construction, and operation of the proposed project will be responsibility PSB-MDUS, which has the necessary resources and staff available for these purposes.

Operation and Maintenance

Organization: The Municipal Drainage Utility System

Pretreatment: Not applicable

Operation plan: The sponsor will provide all required resources including equipment and staffing for effective operation and maintenance as wells as regulatory compliance of these facilities.

Permits, licenses, and other regulatory requirements:

- All approvals needed for construction will be obtained once final designs are completed. Construction permits will be obtained as soon as the contracts are awarded

	when the Notice to Proceed is issued for each project component. - For the Cebada Pump Station and Force Main Project several permits are required such as: a Texas Department of Transportation (TxDOT) crossing Permit and IBWC approval for discharge into the Rio Grande River. - It is required the approval of the TCEQ for modifications in the Van Buren Dam Project. The EPWU will submit the Van Buren Dam final design to the TCEQ for review and approval. - Permit by the EPWCID No. 1 is needed.
Reviewing agencies:	BECC, NADB, TCEQ, IBWC, CILA, EPA, TXSHPO, USACE, U.S. Fish and Wildlife, TX Parks and Wildlife.

Pending Issues:

None

Criterion Summary:

The project complies with BECC's Technical Feasibility criteria.

4. Financial Feasibility

4.a Verification of Financial Feasibility

Financial Conditions

Information Presented: Utility's Audited Financial Statements.

Summary of Financial Analysis: Utility has enough revenues to service the proposed debt.

Project total cost, financial structure and other capital investment plans

Concept:

Construction costs, management, supervision and contingency costs: US $67.5 million

Total Cost: US $67.5 million

Financial Structure:

Source	Type	Amount	%
NADB	Loan	$53.00	78.5%
TWDB	Loan	7.55	11.2%
Municipal Drainage Utility	Equity	6.95	10.3%
Total:		$67.50	100.0%

Dedicated Revenue Source

Revenue Source: Utility's Net Revenues.

4.b Legal Considerations

Project Administration: The project will be managed by the PSB-Municipal Drainage Utility System, who has adequate staff to manage the proposed infrastructure and address any potential emergency related to the implementation of the project.

Financing status: Loan contract to be signed once project is certified.

Pending Issues:

None.

Criterion Summary:

The project complies with BECC's Financial Feasibility criteria.

5. Public Participation

5.a Community Environmental Infrastructure Projects – Community-wide impact

Local Steering Committee

Date of Establishment:	The project sponsor established a Stormwater Master Plan Advisory Committee to incorporate community values in the development of a Stormwater Master Plan. The Advisory Committee was formed in July 2008.
Local Steering Committee:	The Advisory Committee included representatives from 25 community organizations including independent school districts, chambers of commerce, neighborhood associations, businesses, UTEP and IBWC, among others. The committee had a technical support group formed by members of El Paso Water Utilities, City of El Paso and consultants. Between September 2008 and February 2009 the committee held nine meetings, one of which included a tour of the stormwater system. The Committee recommended the project components proposed for certification and submitted their final report in February 2009.
Date of Approval of Public Participation Plan:	The Public Participation Plan was approved by BECC in July 2009.

Public Access to Project Information

Public Notice:	The sponsor held a public meeting regarding the project, providing adequate notice of the meeting, pursuant to Texas state law.
Additional outreach activities:	The Stormwater Master Plan and Stormwater Master Plan Advisory Committee's Final Report have been made available to the public through the sponsor's home page. There has been extensive media coverage of the proposed project, including television and radio coverage, as well as several articles were published in local newspapers. Furthermore, a proposition included in El Paso's most recent City Elections resulted in strong community support for the sponsor to assume the management of the stormwater system and thus the proposed project. A total of 37 presentations on the project were made in the community including but not limited to: the University of Texas at El Paso, the El Paso Chamber of Commerce, the Rio Grande Citizen's Forum of the IBWC, and the El Paso City

	Council.
Public Meeting:	The public meeting was held by the sponsor on March 11, 2009 to approve the Stormwater Master Plan and the Master Plan Advisory Committee Final Report. Approximately thirty-one people were in attendance, plus local television and press coverage. Support for the Stormwater Master Plan and Advisory Committee Final Report was unanimous.
Final Public Participation Report	
Final Report:	The Final Public Participation Report was submitted on July 2009. The report demonstrates that the public participation criterion and objectives were fully met to BECC's satisfaction.
Post-Certification Public Participation Activities	
Post-Certification Activities:	The project sponsor provided a general description of public participation activities to be carried out after the project's certification to support its implementation and long-term feasibility.

Pending Issues:

None

Criterion Summary:

The project complies with BECC’s Public Participation Criteria.

6. Sustainable Development

6.a Human and Institutional Capacity Building

Project Operation and Maintenance:

The project sponsor will be the agency responsible for operating and maintaining the system as it relates to:

- Stormwater drainage
- Stormwater discharge

The annual average construction budget of the sponsor for the last 15 years is approximately $42.5 million, and could reach $200 million.

The sponsor has the basic institutional and human capacity to operate and maintain the following:

- Proposed stormwater drainage system

Relevant staff will be trained for operation of new facilities as necessary.

Human and Institutional Capacity Building:

Actions within the scope of the project that contribute to institutional and human capacity building for the sponsor include:

- Provide stormwater drainage services in a continuous, efficient, and cost-effective approach.
- Operate stormwater drainage system that meets applicable local, state, and federal regulations.
- Provide training and continuing education to the utility's operating staff that offer essential services to satisfy the needs of the community and provide responsible maintenance of the improved infrastructure.
- Optimize the use of scare water resources, and raise public awareness about the importance of water for the community development.
- Full implementation of new rate structure.

Additional Plans or Programs:

There is a water reclamation program as part of the wastewater treatment system.

In the same manner, it is planned to use the accumulated water in the dams and drains to recharge the Hueco Aquifer.
The sponsor completed the Water Conservation Plan on

January 2006. The Water Conservation Plan holds workshops and training sessions throughout the community on various subjects related to water conservation. During the FY 08-09 were carried out 182 presentations at local schools and community groups. For FY 09-10 the target is 200 presentations.

6.b Conformance to applicable Local, State, and Regional Regulations and Conservation and Development Plans.

Local and Regional Plans addressed by the project:

The proposed project conforms to applicable plans and actions described in the following documents:

- City of El Paso Stormwater Master Plan
- 3-year Capital Improvement Program
- City of El Paso Engineering Department Drainage Design Manual
- Northeast Master Plan
- Westside Land Study

The City of El Paso Stormwater Master Plan establishes the need to improve stormwater drainage infrastructure within the city and surrounding areas.

The implementation of the project will eliminate risks inherent to inappropriate stormwater management.

The project adheres to the U.S.-Mexico Border 2012 Environmental Program by meeting Goal 1 (Reducing water contamination). One of the program's guiding principles is to reduce major risks to public health, and conserving and restoring the natural environment.

The project proposes to recharge the Hueco Aquifer for future use.

Laws and regulations met by the project:

- The project meets applicable federal, state and municipal regulations pursuant to stormwater drainage system.
- The project has the Municipal Separate Storm Sewer System Permit issued by the TCEQ.
- Stormwater Management Plan was approved by the TCEQ simultaneously with the MS4 Permit.

Impacts to neighboring communities in the U.S.:

- Lessen silt transport into the Rio Grande due to the uncontrollable flooding affecting both sides of the border.
- Protect the neighbor city of Ciudad Juarez, Chihuahua from floodings and overflows.

6.c Natural Resource Conservation

The sponsor will include Green Infrastructure Design (GID) techniques as design considerations for the 15 projects in the Stormwater Master Plan. Part of the design guidance provided to the Engineer by sponsor includes the use of feasible "Green" techniques and cost-effective design such as porous/semiporous products. It is important to note that several GID techniques used in regions with arid climates may be applicable to the El Paso Region. These references include:

- The Flood Control District of Maricopa County (FCDMC) from Phoenix Arizona.
- The Truckee Meadows Regional Stormwater Quality Management Program Low Impact Development Handbook from the Nevada Division of Environmental Protection (NDEP).
- The Urban Storm Drainage Criteria Manual from Denver, Colorado.
- The Practical Streambank Bioengineering Guide by United States Department of Agriculture –Natural Resources Conservation Service.
- The Best Management Practices Handbook from NDEP.

The GID practices include vegetated infiltration systems, streambank bioengineering, swale and buffer strips, porous paving systems, greenways and infiltration systems, stormwater ponds and wetlands, low flow channels, grade control/drop structures and underground detention and retention for specific improvements.

Thick concrete linings are to be used only if the design Engineer demonstrates that such heavy armoring is necessary to combat the high turbulence and velocities of the channeled stormwater. Stormwater infrastructures (dams, basins, channels, etc,) are restricted areas and are fenced to prevent access by the public to avoid the above mentioned undesirable uses.

6.d Community Development

The completion of this project is crucial to the development of the community. The tasks proposed by the project will contribute to the appropriate stormwater management, which in turn will reduce the conditions that favor the proliferation of water-borne diseases.

The proposed improvements will promote community development, as it will reduce water borne contamination in the city and improve the quality of life for local residents.

The project will help the city achieve a more efficient stormwater drainage system, which in turn will enhance the development of the community, since it will reduce contamination on the streets caused by stalled stormwater. In addition, it supports the harmonious growth of areas that currently lack this service by promoting the development of other infrastructure such as street paving.

Pending Issues:

None

Criterion Summary:

The project complies with BECC's Sustainable Development.

Available Documents

- John Walton. August 2006 El Paso Flooding: Silver Springs, Shadow Mountain, Sun Harvest, Blockbuster Presentation, University of Texas at El Paso, 2006
- Travis Madsen, Emily Figdor. When It Rains, It Pours, Environment Texas Research & Policy Center, 2007
- PSB-EPWU Municipal Separate Storm Sewer System Permit, May 2006
- City of El Paso Stormwater Master Plan, URS and MC, Inc., March 2009
- Ordinance of Utility Approval, June 2007
- Stormwater Drainage Project Final Public Participation Report, July 2009