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**GUADALUPE RIVER
at VICTORIA, TEXAS
(Victoria Levee)**

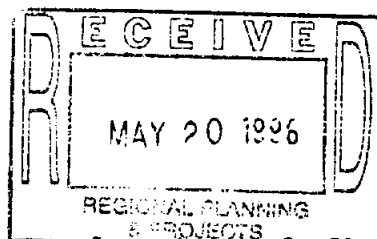
Detailed Project Report

**Section 205
Small Flood Control Project**

**MAIN REPORT
and
ENVIRONMENTAL ASSESSMENT**

**SOUTHWESTERN DIVISION
U.S. ARMY ENGINEER DISTRICT, GALVESTON
OCTOBER 1995**

SYLLABUS



This Detailed Project Report presents the evaluation of flood control plans regarding improvements to the existing levee along the Guadalupe River at Victoria, Texas. The study was conducted under the authority of Section 205 of the 1948 Flood Control Act, as amended. The engineering, economic, social, and environmental impacts for various alternatives have been assessed. Of the various structural and nonstructural plans evaluated, a levee system plan was the most cost effective. Of the various levels of protection evaluated for the levee protection plan, the plan which produced the greatest excess benefits over costs was the 250-year plan which by definition is the National Economic Development (NED) plan. This plan, like all of the levee plans, consisted of upgrading and lengthening the existing levee to provide for the appropriate level of protection. This plan is displayed in this report.

The City of Victoria, the local sponsor, has indicated that their main interest is to minimize costs, maximize protection, and to qualify for the Federal Emergency Management Agency (FEMA) Flood Insurance Program. The 100-year plan would not satisfy the sponsor's requirement because this plan does not have the required three feet of freeboard above the protection required for the 100-year storm. The 217-year plan would satisfy the sponsor's needs and is therefore, the locally preferred plan. Since the 217-year plan is less costly than the NED plan and still satisfies all technical, economic, and environmental requirements, it is the Selected Plan.

The total first cost of the Selected Plan is estimated at \$9,348,495. This converts to average annual costs of \$825,000 including interest during construction and annual operation and maintenance costs. Average annual benefits for this plan are estimated to be \$2,302,000 which produces a benefit to cost ratio of 2.79.

Cost apportionment between the Federal Government and the local sponsor is in accordance with the Water Resources Development Act of 1986, but the Federal share is further constrained by the stipulations of Section 205 which limits the total Federal costs to \$5 million. Therefore, the non-Federal share is \$5,367,600. The City of Victoria has expressed its intent to provide the necessary items of local cooperation for the Selected Plan.

GUADALUPE RIVER AT VICTORIA, TEXAS
 (Victoria Levee)
 DETAILED PROJECT REPORT

Section 205 Small Flood Control Project

TABLE OF CONTENTS

INTRODUCTION	1
STUDY AUTHORITY	4
STUDY PURPOSE AND SCOPE	5
PRIOR STUDIES AND EXISTING PROJECTS	5
EXISTING CONDITIONS	6
PHYSICAL SETTING	6
GEOLOGY AND SOILS	6
CLIMATE	6
LAND USE	7
VEGETATION AND WILDLIFE RESOURCES	7
WETLANDS	8
ENDANGERED AND THREATENED SPECIES	8
HISTORIC RESOURCES	9
AIR QUALITY	9
PRIME AND UNIQUE FARMLANDS	10
HAZARDOUS AND TOXIC WASTES	10
POPULATION.	11
EMPLOYMENT	12
RETAIL	12
INCOME	12
HOUSING	13
PROBLEM IDENTIFICATION	14
FLOODING PROBLEMS	14
FLOOD OF JULY 3, 1936	15
FLOOD OF SEPTEMBER 2, 1981	16
CURRENT SITUATION	16
FREQUENCY ANALYSIS FOR THE GUADALUPE RIVER	18
WITHOUT-PROJECT CONDITIONS	19
FIELD INVESTIGATIONS	19
MAGNITUDE AND EXTENT OF THE FLOOD PROBLEM	20
Identified Investments	20

TABLE OF CONTENTS (Continued)

Frequency-Damage Calculations	21
Single-Occurrence Flood Losses	22
Other Damage Categories	22
Average Annual Damages (AAD)	23
PLAN FORMULATION OBJECTIVES AND CONSTRAINTS	25
NATIONAL OBJECTIVES	25
PLANNING CONSTRAINTS	26
PLANNING OBJECTIVES	28
PLAN FORMULATION RATIONALE	28
Technical Criteria	29
Economic Criteria	30
Environmental Criteria	30
Social and Other Criteria	31
GENERAL DESCRIPTION OF PRELIMINARY ALTERNATIVES	32
NONSTRUCTURAL MEASURES	32
Floodproofing	32
Raising Structures In-Place	33
Permanent Evacuation of the Floodplain	33
Floodplain Management	34
Zoning Regulations	34
Subdivision Regulations	34
Building Codes	35
Stormwater Management	35
Flood Forecasting and Temporary Evacuation	36
STRUCTURAL MEASURES	36
Detention Structures	37
Levees and Floodwalls	37
Channel Improvements	38
Floodwater Diversion	38
NO ACTION	38
DESCRIPTION AND ANALYSES OF PRELIMINARY	
STRUCTURAL ALTERNATIVES INVESTIGATED	39
DIVERSION CHANNEL	39
BRIDGE ENLARGEMENT	41
GREEN SUBDIVISION RING LEVEE	41
VICTORIA LEVEE ALTERNATIVES	42

TABLE OF CONTENTS (Continued)

SCREENING OF ALTERNATIVES	45
ECONOMIC EVALUATION OF ALTERNATIVES	47
FREQUENCY-DAMAGE CALCULATIONS	48
RISK AND UNCERTAINTY ANALYSIS	48
WITH-PROJECT CONDITIONS	49
Plan Investigated	49
Estimates of Annual Benefits	49
Benefit-Cost Comparisons and NED Plan Selection	50
PLAN SELECTION	52
DESCRIPTION OF THE SELECTED PLAN	53
OPERATION AND MAINTENANCE	55
REAL ESTATE	56
LANDS, EASEMENTS, AND RIGHT-OF-WAY REQUIRED	56
RELOCATION ASSISTANCE	57
ESTIMATED VALUATION	57
RAILROAD BRIDGE RELOCATION	57
ROADWAY BRIDGE RELOCATIONS	58
PIPELINES AND UTILITY RELOCATIONS	58
MISCELLANEOUS STRUCTURES	59
COST ESTIMATES	60
PLAN ACCOMPLISHMENTS	61
SUMMARY OF BENEFITS AND COSTS	62
PLAN IMPLEMENTATION	63
DIVISION OF PLAN RESPONSIBILITIES	63
NON-FEDERAL CASH CONTRIBUTION	63
PROJECT COOPERATION AGREEMENT	65
FINANCIAL ANALYSIS	65
SCHEDULE FOR DESIGN AND CONSTRUCTION	65
STUDY PARTICIPATION AND COORDINATION	66
RECOMMENDATIONS	67

TABLE OF CONTENTS (Continued)

LIST OF FIGURES

<u>Figure</u>	<u>Title</u>	<u>Page</u>
1	Vicinity Map	2
2	Study Area Map	3
3	Economic Evaluation Reaches	24
4	River Diversion Alignment	40
5	Green Subdivision Ring Levee Alignment	43
6	Proposed Levee Alignment	54

LIST OF TABLES

<u>Table</u>	<u>Title</u>	<u>Page</u>
1	Significant Floods	15
2	Victoria Flood Stages and Areas	17
3	Expected Probability Discharges	18
4	Major Damage Categories	19
5	Summary of Single-Occurrence Event Damages	21
6	Average Annual Damages by Reach and Damage Category	23
7	Average Annual Damage to Existing Development	50
8	Summary of Economic Evaluation	51
9	Pipeline and Utility Relocation	59
10	Estimated Cost of Selected Plan	60
11	Average Annual Equivalent Benefits and Residual Damages by Damage Category for Selected Plan	61
12	Summary of Average Annual Costs and Benefits for Selected Plan	62

LIST OF APPENDICES

<u>Appendix</u>	<u>Title</u>
A	Hydrology and Hydraulics
B	Economic and Social
C	Geotechnical
D	Civil Design and Relocations
E	Structural Design
F	Real Estate
G	Cost Estimates
H	Operation and Maintenance
I	Project Cooperation Agreement
J	Statement of Financial Capability
K	Letter of Intent
L	Abbreviations

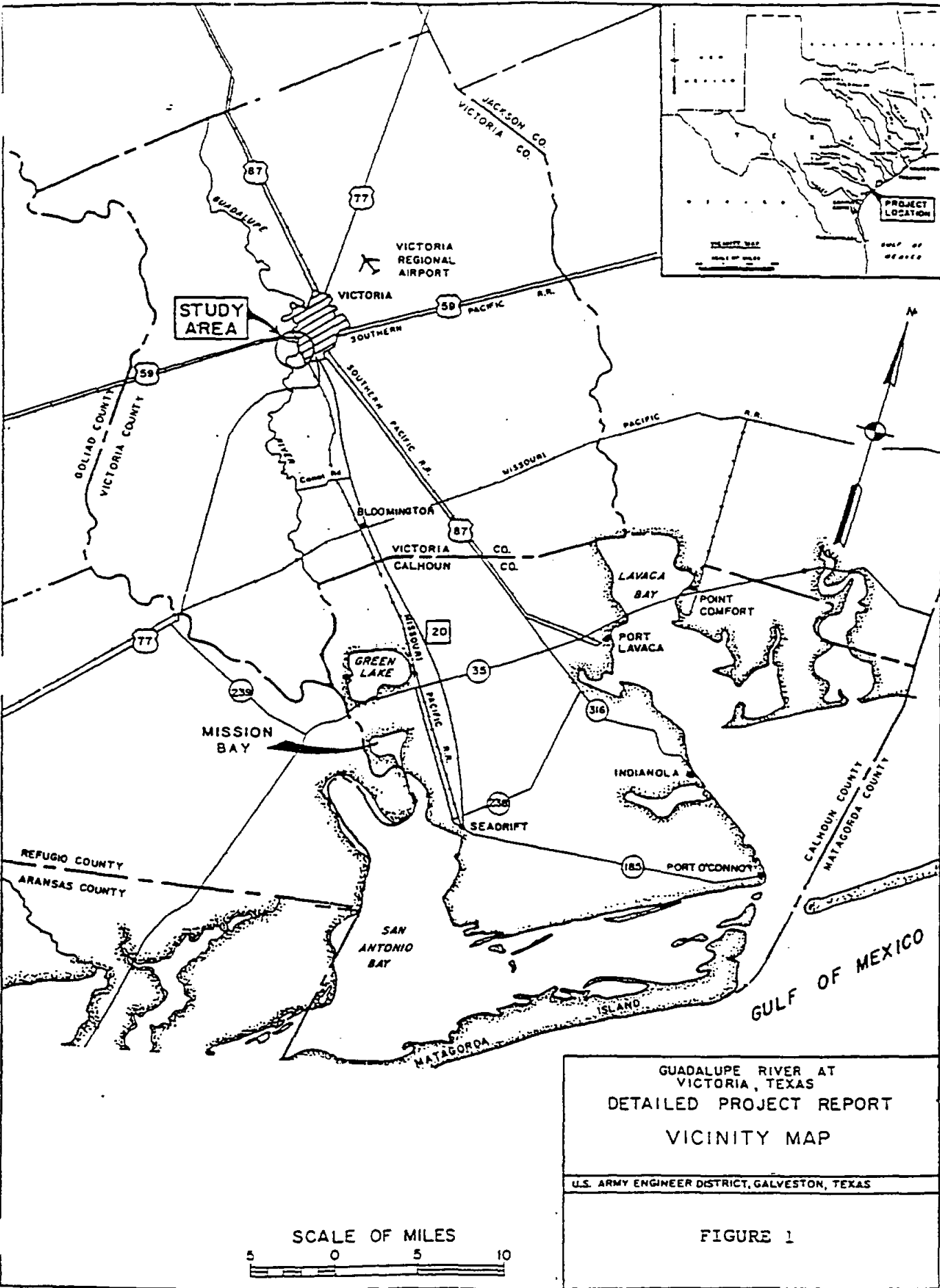
GUADALUPE RIVER AT VICTORIA, TEXAS
(Victoria Levee)
DETAILED PROJECT REPORT

Section 205 Small Flood Control Project

INTRODUCTION

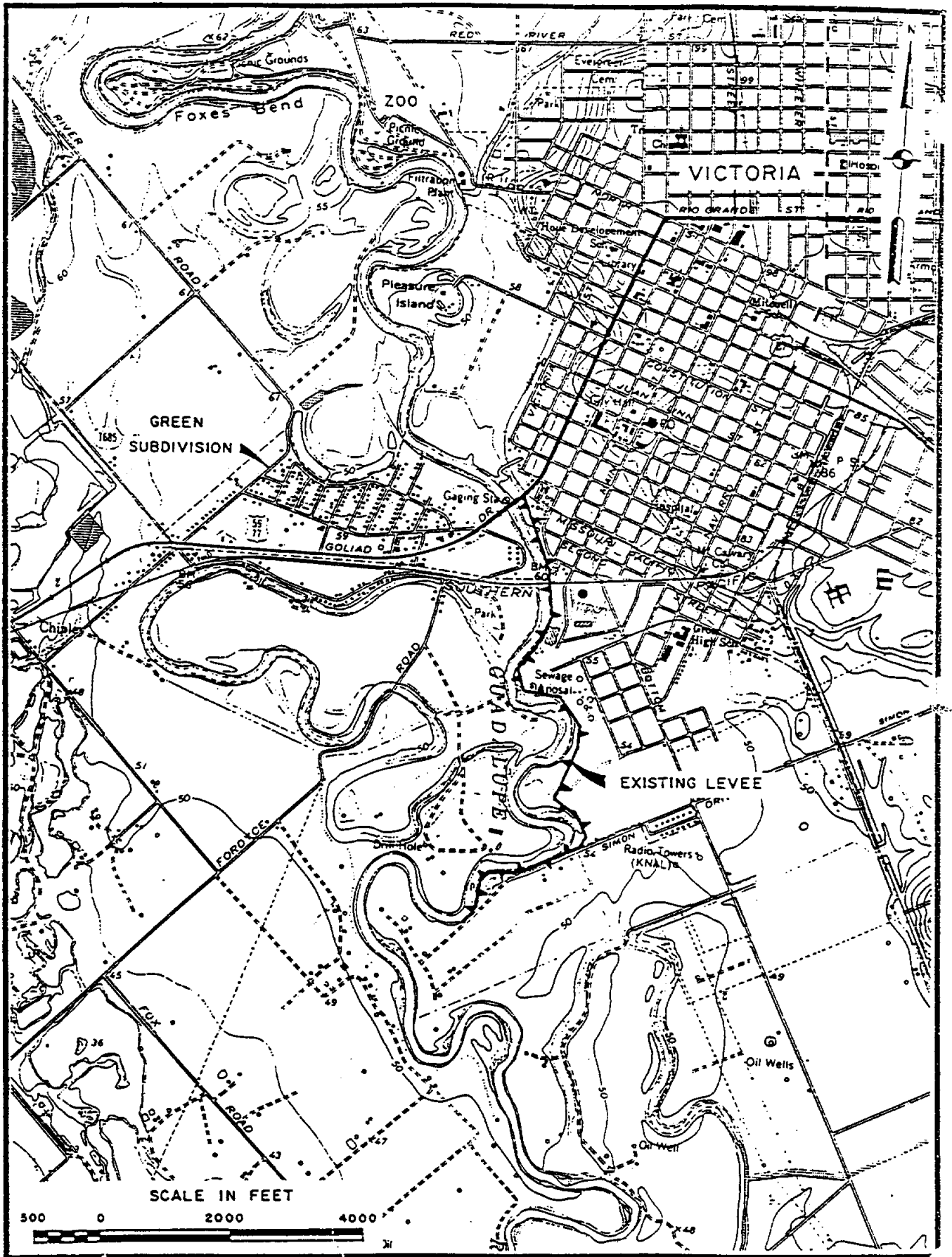
This report investigates the potential for reducing flooding from the Guadalupe River at Victoria, Texas. The City of Victoria is located approximately 123 miles from Houston, 116 miles from San Antonio, and 85 miles from Corpus Christi. The present levee at Victoria extends along the east side of the Guadalupe River beginning at U.S. Highway 59 and continues downstream about 1.4 miles (Figures 1 and 2).

The community suffers frequent river flooding, which causes annualized damages in excess of \$1.25 million. An existing levee, constructed along the east bank of river in about 1936 by the Works Progress Administration, is subject to flanking at both ends by flood flows with a 2-year recurrence interval. Gravity drains through the levee are ungated. The levee was repaired by the Corps of Engineers in 1962 and 1977 under emergency authority. The current levee system does not provide flood protection and has not been recently maintained by the city. The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps for the city consider the levee non-existent for flood insurance purposes.



GUADALUPE RIVER AT
 VICTORIA, TEXAS
 DETAILED PROJECT REPORT
 VICINITY MAP
 U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

FIGURE 1



STUDY AREA MAP

FIGURE 2

Local interests have requested Federal assistance in improving the levee to provide protection for the 100-year flood. Reconnaissance-level investigations indicated that such improvements would be economically justified. To ensure identification of the plan providing the maximum excess benefits over costs, these feasibility investigations considered both structural and nonstructural alternatives. These alternatives included flood proofing, elevating structures, permanent evacuation and relocation, flood detention structures, levees and floodwalls, channel improvements, and diversion channels.

STUDY AUTHORITY

This study was conducted under the authority of Section 205 of the Flood Control Act approved June 30, 1948, as amended, which states:

"The Secretary of the Army is authorized to allot from any appropriations heretofore or hereafter made for flood control, not to exceed \$40,000,000 for any one fiscal year, for the construction of small projects for flood control and related purposes not specifically authorized by Congress, which come within the provisions of Section 1 of the Flood Control Act of June 22, 1936, when in the opinion of the Chief of Engineers such work is advisable. The amount allotted for a project shall be sufficient to complete Federal participation in the project. Not more than \$5,000,000 shall be allotted under this section for a project at a single locality. The provisions of local cooperation specified in Section 3 of the Flood Control Act of June 22, 1936, as amended, shall apply. The work shall be complete in itself and not commit the United States to any additional improvement to insure its successful operation, except as may result from the normal procedure applying to projects authorized after submission of preliminary examination and survey reports."

The study was requested by letter dated May 5, 1988, from Mr. James J. Miller, Victoria City Manager.

STUDY PURPOSE AND SCOPE

The purpose of this study was to determine the feasibility of providing flood protection measures for the City of Victoria by upgrading and lengthening the existing levee along the river. The existing levee does not tie-in to high ground and the top elevation of the levee does not provide 100-year protection.

PRIOR STUDIES AND EXISTING PROJECTS

A report, Flood Plain Information - Guadalupe River, Spring Creek, and Lone Tree Creek, Victoria, Texas, was prepared July 1968 by the U.S. Army Corps of Engineers (COE). The Flood Insurance Study, City of Victoria, Victoria County, Texas, was a FEMA report which was prepared in 1985 and updated in 1987. COE completed an Initial Appraisal Report in September 1988, and a Reconnaissance Report in January 1990. The Reconnaissance Report entitled Local Flood Protection Levee, Victoria, Texas was prepared under the Section 205 study authority. The Reconnaissance Report presents the results of a preliminary evaluation of flood control improvements at Victoria.

The only flood control project in the area is the forementioned levee constructed along the east bank of the river in about 1936, reportedly by the Works Progress Administration, to protect a portion of the City of Victoria. The levee is subject to flanking at both ends by floods exceeding a 2-year recurrence frequency.

EXISTING CONDITIONS

PHYSICAL SETTING

Victoria is located within the coastal prairie physiographic region of Texas, which extends inland 30 to 60 miles. This area is a nearly level, slightly dissected plain with poorly developed drainage. Land elevations along the river south of Victoria are approximately 55 feet. Primary topographic features include the river channel and numerous small oxbows and abandoned channels within the floodplain.

The study area is situated along 2.4 miles of the Guadalupe River's east bank within the city limit of Victoria. A vicinity map of the study area is presented in Figure 1 and a study area map is presented in Figure 2.

GEOLOGY AND SOILS

At Victoria, which is about 30 miles inland from Guadalupe Bay, the river becomes entrenched 10 to 15 feet in a Pleistocene Age, Beaumont Clay formation which averages about 700 feet in thickness. This formation consists of plastic, poorly bedded clay with pockets and layers of sand. The river valley is overlaid by deposits from upland erosion and contains extensive deposits of sand and gravel of commercial value in the vicinity of the city.

CLIMATE

Victoria is located in a mild, subtropical region with warm summers and moderate winters. The proximity of the warm Gulf of Mexico and the prevailing south-to-southeasterly winds results in a predominantly marine climate. Winters are

mild, with polar Canadian air masses moving southward across Texas to the Gulf of Mexico producing cool, cloudy, rainy weather. Summer months are normally dry, with occasional thunderstorms or other weather disturbances producing intense precipitation. The area is also subject to tropical storms and hurricanes, usually occurring between June and October. Normal daily temperatures at Victoria average 61.0 degrees Fahrenheit minimum and 79.3 degrees maximum. Rainfall amounts average about 36 inches annually.

LAND USE

Land use in the immediate project area is largely urban. The surrounding region is composed primarily of agricultural land and brushland. Brushland is usually associated with rangeland and abandoned agricultural land. Woodlands are common along the banks of the Guadalupe River, oxbows, and abandoned channels. Areas of current and abandoned sand and gravel mining are also common.

VEGETATION AND WILDLIFE RESOURCES

The distribution of vegetation and wildlife in the project area is influenced by the general land use, which is dominated by urban development and agriculture production. Urban development frequently occurs immediately adjacent to the Guadalupe River and is the primary factor controlling the growth of vegetation and the prevalence of wildlife. Agricultural production and brushland are additional factors that influence the abundance and distribution of these resources.

The Guadalupe River's banks and its associated floodplain, provide abundant wooded areas. Fence rows and areas adjacent to roads and drainage ditches are occupied by stands of brush and trees of various sizes. Abandoned sand and gravel pits that have revegetated with various species of brush and trees are also common. The most common tree species in the project area are pecan, box elder, cedar, elm, red buckeye, and roughleaf dogwood.

Because of extensive urban development, the area offers only limited food and ground cover for wildlife species that have adapted to human disturbance including a variety of rodents, mammals, and songbirds.

WETLANDS

Wetland resources in the immediate project area include the Guadalupe River and associated oxbows and abandoned channels. Portions of the river bank and other frequently flooded areas may also be classified as wetlands from a jurisdictional perspective. However, no strict jurisdictional determination has been accomplished as part of this study since virtually all project-related activities would be accomplished on high ground.

ENDANGERED AND THREATENED SPECIES

Species listed as endangered or threatened that could occur in the general project area and adjacent coastal areas include the brown pelican, peregrine falcon, bald eagle, whooping crane, American alligator, and several sea turtles. Since Victoria is located about 30 miles from coastal waters, no sea turtles are found in the immediate project area. The pelican, falcon, eagle, and whooping crane may be

occasionally observed passing through the area and are not permanent residents. The alligator is known to occur in the Guadalupe River delta area and may occur farther upstream.

HISTORIC RESOURCES

A field survey of historic resources in the area of the proposed levee alignment and borrow pits has been accomplished. A previously unrecorded prehistoric archaeological site was identified, and a determination was made that the site was not potentially eligible for inclusion in the National Register of Historic Places.

AIR QUALITY

The project area is situated within the Texas Air Quality Control Region No. 5 and an air quality monitoring station is maintained in Victoria by the Texas Natural Resources Conservation Commission (TNRCC). Pursuant to Section 107 of the Clean Air Act of 1977, the Environmental Protection Agency (EPA) and TNRCC determine whether each area of the state is attaining or not attaining required primary and secondary air quality standards. Federal standards have been established in the Victoria area for sulfur dioxide, carbon monoxide, nitrogen dioxide, total suspended particulate, and ozone. The TNRCC indicates that the area has an attainment status for carbon monoxide, sulfur dioxide, nitrogen dioxide, and particulate. Diffusion conditions in the immediate project area are good, with wind speeds averaging about 7 to 10 miles per hour from the south to southeast out of the Gulf of Mexico.

PRIME AND UNIQUE FARMLANDS

The general project area contains large acreage of agricultural land. Because of the importance of agriculture to the economy and the continuing encroachment by development, the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), has been identifying and inventorying prime and unique farmlands. Prime farmland, as defined by the NRCS, is land best suited to producing food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and moisture supply needed to economically produce a sustained high yield of crops when treated and managed using acceptable farming methods. Approximately 153,000 acres or 27 percent, of the land area in Victoria County meet the requirements for prime farmland. Soil types include the Victoria, Lake Charles, Meguin, and Trinity units, which are used for cultivation of crops, principally grain sorghum, cotton, and corn. The Meguin soil unit is the only prime farmland soil that occurs in the immediate project area.

HAZARDOUS AND TOXIC WASTES

Land use in the project area includes undeveloped parcels, residential, and industrial sites. Most of the affected land is undeveloped or agricultural. The main areas of concern with respect to potential for hazardous and toxic wastes are:

- a. An effluent pipe that extends through the levee from the wastewater treatment plant;
- b. The area of the levee adjacent to a fuel oil storage tank;

c. The remains of a railroad track with associated loading dock; and

d. A plugged and abandoned oil/gas drilling site.

The corridor along the proposed and existing levee is primarily undeveloped or residential, with the exception of the commercial businesses such as the power plant and the wastewater treatment plant. Regulatory reports indicate that, with the exception of a plugged oil/gas well and two small releases at the power plant, no known solid or hazardous waste sites or unregulated releases of contaminants have occurred in the project area.

POPULATION

The total population of Victoria County and the City of Victoria increased continuously from 1900 to 1990. The county population increased from 68,807 in 1980 to 74,361 in 1990 and the city population increased from 50,695 in 1980 to 55,076 in 1990. This represents an 8.1 percent increase for the county and a 8.6 percent increase for the city. The City of Victoria constituted approximately 74 percent of Victoria County's population in 1960, 1970, 1980, and 1990. The City of Victoria's population density in 1990 was approximately 1,967 persons per square mile. The county comprises 887 square miles and has a 1990 population density of approximately 84 persons per square mile. Future growth is expected in the City of Victoria because of expanding employment opportunities in the petrochemical industry.

EMPLOYMENT

The prime employers are found in the Trade, Service, Miscellaneous, Government and Manufacturing sectors which account for approximately 78 percent of the county employment in 1988. Employment is expected to continue to increase in all five sectors particularly in the trade industry which includes the petro-chemical plant expansions. The number of employed persons in the City of Victoria increased in 1988, 1989, and 1990. The population to employment ratio average for 1980-1990 was approximately 1.8, or one worker typically supports 1.8 people. Victoria County had an unemployment rate of 5.0 percent in 1990, compared to a state average of 6.2 percent.

RETAIL ACTIVITIES

Victoria functions as a regional medical and retail center for Victoria, Jackson, and Calhoun counties. The city's seven retailers employed approximately 1,318 persons in 1988 or approximately 5 percent of the total persons working. Retail sales increased from \$126 million in 1980 to \$606 million in 1990.

INCOME

Victoria County's per capita income in 1988 was \$14,653, which was approximately 1 percent higher than that for the State of Texas. Total personal income for Victoria County increased from 1983 to 1990. The median household income for Victoria increased in 1988, 1989, and 1990. In 1986, 1,320 persons received Supplemental Security Income in Victoria County, compared to 264,760 for the state. This represented 2.3 percent of Victoria County's population, compared to 1.6

percent for the state. In 1985, 9,401 persons received Social Security Benefits in Victoria County, compared to 1,949,233 for the state. This represented 17 percent of the county's population compared to 11.6 percent for the state.

HOUSING

Data regarding housing in Victoria is not readily available. Home construction is heavily influenced by fluctuations in the oil and gas industry. Housing starts declined in 1986-1987 and increases in 1989-1990. In 1980, there were 22,988 housing units in Victoria County with a median price of \$38,800, compared to 4,929,267 units for the state with a median price of \$39,100.

PROBLEM IDENTIFICATION

FLOODING PROBLEMS

Major flooding along the Guadalupe River has been documented since 1833. The first records of river stage and discharge on the Guadalupe River date from September 1904, when the U.S. Weather Bureau established a chain gage on the U.S. Highway 59 bridge in Victoria. This gage continued in use until November 1934 when the United States Geological Survey (USGS) installed a continuous recorder. Since that time, continuous gage height and discharge records have been maintained at the site.

The highest recorded flood occurred in 1936 at a river stage of 31.2 feet. The second highest flood occurred in 1981. Table 1 shows the dates of the 10 most significant flood events and provides peak stages and discharges that have occurred at the City of Victoria. The data are shown in feet (FT) based on National Geodetic Vertical Datum (NGVD) and flows are expressed in cubic feet per second (cfs). The approximate recurrence interval for the 1833 and the 1936 events was 100 years. Details of the 1936 and 1981 floods are described below.

TABLE 1

SIGNIFICANT FLOODS
 IN ORDER OF FLOOD STAGE MAGNITUDE*
 GUADALUPE RIVER AT VICTORIA, TEXAS

ORDER NO.	DATE OF CREST	STAGE (FT)	GAGE HEIGHT ELEVATION (FT)	FLOW (CFS)
1	Jul 3, 1936	31.22	60.3	179,000
2	Sep 2, 1981	31.05	60.2	105,000
3	Sep 21, 1967	30.67	59.8	70,000
4	Jun 7, 1987	30.45	59.6	83,400
5	May 16, 1972	30.37	59.5	58,500
6	Jun 22, 1961	30.35	59.5	55,800
7	Feb 26, 1958	30.28	59.4	58,300
8	Jun 1, 1929	30.20	59.4	79,000
9	Apr 24, 1977	30.09	59.2	54,500
10	Dec 27, 1991	30.03	59.2	54,500

* Because of a shifting channel bottom, peak discharges (Flow) do not fall in same magnitude order as stage heights.

FLOOD OF JULY 3, 1936

On this date, the river reached a gage reading of 31.22 feet at the Victoria gage, the highest stage ever recorded. The equivalent discharge was 179,000 cfs.

This flood resulted from 6 days of rainfall over the Guadalupe River watershed produced by a small-diameter, severe-intensity tropical storm that formed in the Gulf of Mexico a short distance east of Corpus Christi Bay on the morning of June 27. The storm moved inland at Port Aransas and headed northwestward, with the wind velocity estimated at 80 miles per hour. In eight hours, the storm ended. One area in the upper reach of the basin had 21 inches of

rainfall. Gonzales, 60 miles northwest of Victoria, experienced 9.01 inches in one 24-hour period.

The river currents washed away the embankment and pavement support near the concrete trestle west of the U.S. Highway 59 bridge. This caused highway traffic to be halted west and southwest of Victoria. For several days, there was no rail traffic to Beeville or to San Antonio. Sections of the Southern Pacific Railroad tracks southwest of Victoria were under 4.5 feet of water. Some 350 refugees were fed and clothed by the local unit of the Red Cross until the waters receded. Total damages in Victoria County were estimated at \$2 million at 1936 price levels.

FLOOD OF SEPTEMBER 2, 1981

On this date, as a result of rains up to 16 inches accompanying a slow-moving tropical depression, the Guadalupe crested at 31.05 feet, the second highest gage reading at Victoria. Moody Street, U.S. Highway 59, Loop 175, and U.S. Highway 87 were closed to traffic for several days. Residents of Riverside Park, the Green Subdivision just west of the Moody Street Bridge, and those living south of Constitution Street and west of Moody were evacuated to an American Red Cross relief shelter.

CURRENT SITUATION

A levee was constructed in the 1930s on the east side of the river to protect a portion of the city. However, hydraulic studies conducted as part of this feasibility investigation determined that flows of magnitudes equaling a 2-year frequency event would flank the levee and flood the area behind it. In addition, gravity drains through the

levee are ungated and allow flood waters to penetrate the area.

Green Subdivision is located on the west side of the Guadalupe River directly across the river from the main portion of Victoria. When river flows exceed bankfull capacity, floodwaters travel overland west of the subdivision, rejoining the river farther downstream. As the flooding increases, floodwaters enter the subdivision, eventually covering the entire area. Residents fear that improvements to the levee system east of the river will worsen the flooding.

Table 2 lists the flooded areas in Victoria in relation to various stages at the Victoria gage.

TABLE 2

VICTORIA FLOOD STAGES AND AREAS

STAGE (FT.)	GAGE HEIGHT ELEVATION (FT, NGVD)	FLOODED AREA
21	50.15	Flood stage for lowland flooding.
27-28	56.15-57.15	Some areas of the Victoria Zoo flood.
28-29	57.15-58.15	U.S. Highway 59 is closed.
29.5	58.65	First homes in Green Subdivision flood.
30.45	59.60	Forty to fifty homes flood in Green Subdivision, and the area west of Moody Street floods.
31	60.15	Forty blocks of Victoria flood.

FREQUENCY ANALYSIS FOR THE GUADALUPE RIVER

A flow frequency analysis was conducted for the USGS gage located at Moody Street on the Guadalupe River. The procedure used is explained in detail in Appendix A. Since July 21, 1962, flows have been regulated by Canyon Lake, located 252.3 miles upstream of Moody Street. The drainage area of the watershed above the Moody Street gage is 5,198 square miles, of which 1,432 square miles are above Canyon Dam. Gage data after July 21, 1962 up to the present were used in the frequency analysis. Expected probability discharges for the 2-, 5-, 10-, 25-, 50-, 100-, and 500-year frequencies were attained from this analysis and are shown in Table 3.

TABLE 3

EXPECTED PROBABILITY DISCHARGES

RETURN YEARS	DISCHARGE (CFS)
2	16,100
5	39,600
10	57,000
25	94,500
50	132,000
100	179,000
500	348,000

The 100-year discharge of 179,000 cfs was computed. This equals the flood of record that occurred on July 3, 1936 and resulted in a stage of 31.22 feet. The gage has a datum of 29.15 feet above zero elevation (NGVD), making the maximum recorded elevation to be 60.37 feet (NGVD).

WITHOUT-PROJECT CONDITIONS

FIELD INVESTIGATIONS

In April 1991, a field inventory was made of the floodplain lands behind the existing levee and proposed levee extensions in order to identify existing floodplain development. The study area was divided into reaches as shown in Figure 3. Data were collected on the number, type, and value of structures located within the 500-year flood plain. First-floor elevations were also estimated for each structure in the floodplain. Damageable properties were classified into the major damage categories shown in Table 4. The depreciated replacement cost value of the structures identified was also estimated.

TABLE 4

MAJOR DAMAGE CATEGORIES

<u>DAMAGE CATEGORY</u>	<u>ACTIVITY DESCRIPTION</u>
Residential	Single-family dwellings
Commercial	Retail and wholesale businesses
Public	Public and quasi-public buildings
Industrial	Manufacturing facilities
Transportation	Streets, highways, railroads, and bridges
Communications and Utilities	Electrical, gas, telephone, sewer, and water facilities and buildings
Public Health and Relief	Emergency health and relief
Vehicles	Vehicles

The value of existing residential contents was assumed to be 50 percent of the structure value, the percentage generally used by insurance companies. Content values for the other damage categories were based on the estimated current values of inventory, fixtures, and equipment as determined by field investigations and conversations with industrial, commercial, and other property specialists.

MAGNITUDE AND EXTENT OF THE FLOOD PROBLEM

Identified Investments

During the 1991 field survey, 585 structures were identified within the 500-year floodplain. An additional study was conducted during June 1995 to reexamine and update the 1991 field survey. Detailed information on the number and type of structures is displayed in Appendix B.

A breakdown of the values of structures and contents by reach and flood zone was developed. As shown in Appendix B, about 57 percent of the floodplain structures are located within the 0- to 10-year flood zone and comprise about 30 percent of the property values within the 500-year floodplain.

Most of the structures in the 500-year floodplain consist of single family dwellings. These residences vary from one-story, brick veneer with slab foundations to houses on piers and mobile homes. The average age of the structures is over 25 years, with the oldest houses being over 50 years.

A large variation in structure values was found between reaches. The value of floodplain structures ranged from \$10,000 to \$16,000, with an average value of \$13,000.

Depth-percent damage relationships were developed using the data collected during field investigations in prior studies. In establishing these relationships for the various property types, consideration was given to such factors as design, structure, structure contents, and the susceptibility to flood damages.

Frequency-Damage Calculations

Using the water surface profiles, the depth of water at each structure within the Standard Project Flood (SPF) plain was calculated for the 2-, 5-, 10-, 25-, 50-, 100-, 300-, and 500-year events. These depths were combined with the depth-damage curves and real estate values to estimate damages. Damages to the various structures were then summed by frequency to produce a frequency-damage function.

Single-Occurrence Flood Losses

Under present conditions, damages begin with less than a 2-year flood on the Guadalupe River. A 500-year flood event would cause property damages in excess of \$16 million within the study area floodplain. Flood losses for various single-occurrence events are presented in Table 5.

TABLE 5

SUMMARY OF SINGLE-OCCURRENCE EVENT DAMAGES
(JUNE 1995 PRICES AND LEVEL OF DEVELOPMENT IN \$1,000)

OCCURRENCE	500	250	217	150	100	50	25	10	5	2
Residential	6,836	6,504	6,400	3,128	5,770	4,905	4,101	3,425	3,035	552
Public	546	411	399	361	279	207	75	61	59	0
Commercial	1,806	1,329	1,206	926	656	291	226	187	178	0
Industrial	212	122	92	59	22	16	5	0	0	0
Other Costs	2,957	2,677	2,548	2,279	2,136	1,877	1,740	1,566	1,508	18
UTILITIES	67	60	57	51	47	42	37	32	31	0
VEHICLES	3,891	3,523	3,352	2,998	2,810	2,481	2,297	2,060	1,985	24
ROADS	142	117	109	92	77	56	43	37	32	0
TOTAL	16,462	14,743	14,163	12,894	11,796	9,875	8,524	7,367	6,829	595

Other Damage Categories

Although damages to structures and contents usually comprise the bulk of damages from an urban flood, incidental damages also occur to transportation, communications, utilities, vehicles, and residential yards. In addition, public health and relief efforts constitute a flood-related cost or loss. A variety of post-flood studies have been performed to measure these types of damages (e.g., to determine the cost of public health and relief efforts per residential structure flooded). This data was revised using 1995 price levels and used to estimate damages for the various categories.

Average Annual Damages (AAD)

Estimates of AAD were calculated through integration of the damage-frequency curves. AAD were calculated for properties that could receive damages up to the 500-year event. Estimates of existing AAD by reach and major damage category are summarized in Table 6. Figure 3 displays the economic evaluation reaches for the study area.

TABLE 6

AVERAGE ANNUAL DAMAGES
BY REACH AND DAMAGE CATEGORY
(JUNE 1995 PRICES AND VALUES IN \$1,000)

DAMAGE TYPE	REACH					TOTALS	PERCENT
	1A	1B	2	3	4		
Residential	\$ 97	\$528	\$161	\$417	\$ 22	\$1,224	(46)
Commercial	0	64	2	3	7	77	(3)
Public	0	27	0	1	0	27	(1)
Industrial	0	0	0	1	0	1	(0)
Utilities	1	7	1	2	0	12	(0)
Other Flood Costs	59	360	44	95	13	571	(21)
Vehicles	78	473	58	125	17	751	(28)
Roads	<u>2</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>0</u>	<u>13</u>	<u>(0)</u>
TOTALS	\$237	\$1,467	\$266	\$645	\$60	\$2,676	(100)
PERCENT	(9)	(55)	(10)	(24)	(2)	(100)	

The total average annual flood losses in the study area are estimated to be \$2,676,000 based on June 1995 prices; \$1,224,000 are attributable to residential properties. The potential flood threat is most serious in reach 1B which would experience 55 percent of these losses.



PLAN
 SCALE IN FEET
 100 500 1000

- EXISTING LEVEE
- PROPOSED LEVEE
- BORROW AREA

GUADALUPE RIVER AT
 VICTORIA, TEXAS
 ECONOMIC EVALUATION REACHES
 U.S. ARMY CORP. OF ENGINEERS, VICTORIA, TEXAS



PLAN FORMULATION OBJECTIVES AND CONSTRAINTS

NATIONAL OBJECTIVES

In the Flood Control Act of 1936, Congress established a nationwide policy that flood control was in the interest of the general public welfare and was, therefore, a proper activity of the Federal Government in cooperation with the states and local governments. It provided that the Federal government could improve streams or participate in improvements "for flood control purposes, if the benefits to whomsoever they may accrue are in excess of the estimated costs, and if the lives and social security of people were otherwise adversely affected". The 1936 and subsequent acts further specified the details of Federal participation. These actions have enlarged the scope of the Federal interest to include consideration of all alternatives in controlling floodwater, reducing the susceptibility of property to flood damage, and relieving human and financial losses.

The Planning Principles and Guidelines of 1983 and the National Environmental Policy Act (NEPA) of 1969 provide the basis for Federal policy for planning flood damage reduction projects. These policies, derived from executive and legislative authority, establish and define national objectives and goals for water resources planning, suggest the range of impacts to be assessed, and articulate conditions and criteria to be applied in the evaluation of alternate plans. National objectives, from current executive policy, are considered to be generally consistent with the concept of total environment as outlined in the NEPA. Current Federal policy dictates that National Economic Development (NED) is the primary national objective in water resource planning, with equal consideration given to

Environmental Quality (EQ) elements. NED objectives stress increasing the value of the Nation's output of goods and services and improving economic efficiency on a national level. Planning objectives designed to improve NED are concerned with the value of increased outputs of goods and services resulting from external economics associated with a plan.

EQ considerations include the management, conservation, preservation, creation, restoration, or improvement of significant environmental resources. The quality/quantity of the resource's condition should be more desirable with a plan than under the without-project conditions. National objectives, as defined, are designed to insure a systematic interdisciplinary planning assessment and evaluation of plans responsive to the requirements of NEPA.

PLANNING CONSTRAINTS

Plans must be formulated with regard to benefits and costs, both tangible and intangible effects on environmental features and social well-being of the region, and public acceptability and institutional capacity for implementation. The formulation framework requires the systematic preparation and evaluation of alternative solutions to problems concurrent to the objectives of NED with consideration of EQ impacts. The process requires that impacts of the proposed action be measured and results displayed or accounted for in terms of contributions to NED, EQ, Regional Economic Development, and Other Social Effects.

Other improvements proposed by non-Federal interests must be identified and included in the planning process. Interaction with other interests must be maintained

throughout the planning process to avoid duplication of effort, minimize conflicts, obtain consistency, and assure completeness. Any study is limited by certain specific constraints, including the following:

a. Project benefits (monetary and non-monetary) must exceed project costs for a plan to be implemented by the Corps of Engineers;

b. Computations of annual costs and benefits must be based on the applicable Federal interest rate;

c. Fish and wildlife habitat affected by a project should be preserved, if possible. Losses should be mitigated whenever justified;

d. The study process and plans must comply with Federal laws and policies;

e. Plan selection is to be based primarily on economic efficiency;

f. The Federal Government can participate only in resolving the primary flood problems of the basin, which does not include localized drainage problems. Alternative solutions cannot consider lateral drainage problems, such as drainage ditches and storm sewer systems; and,

g. Alternative plans that resolve problems in one area should not create or increase problems in other areas.

PLANNING OBJECTIVES

The study has been guided by objectives that reflect the goals of improving national economic development, while maintaining or enhancing environmental quality. Secondary objectives include the improvement of social well being of the area and increased regional development. More specifically, plans developed in this study should:

a. Contribute to improved physical, emotional, and economic health, safety, and well being by eliminating or reducing the flood hazards and dangers within the drainage basin;

b. Contribute to EQ by maintaining or improving fish and wildlife habitat; and

c. Contribute to agricultural productivity by providing additional opportunities adjacent to channels and other proposed flood control facilities.

PLAN FORMULATION RATIONALE

The rationale for formulating and developing alternative solutions, including identification of functional planning tasks, involvement by the public, and the response to goals and priorities, is discussed in the following paragraphs. The planning framework requires the systematic preparation and evaluation of alternative ways of addressing problems, needs, concerns, and opportunities within the context of EQ.

The planning process for this comprehensive study has followed the general mandate of the study resolution to develop a comprehensive plan to resolve or minimize the

adverse impacts of urban flooding. Secondary objectives have been to address other related water resources problems in the study area. The first phase of this process was to establish the magnitude and extent of the water resources problems and needs of the basin. The social, economic, and environmental impacts were generally assessed.

Technical Criteria

Technical criteria require adequate project dimensions to contain, control, or minimize flooding from existing and future projected urban development within the watershed. These criteria require plans to be compatible and consistent with local flood protection plans. Plans require adequate erosion control measures to insure project integrity.

Structural measures are designed to minimize residual flooding and if possible eliminate the threat to human life. In urbanized areas, a high degree of flood protection is desirable. The potentially disastrous consequences of a reduced degree of protection coupled with a false sense of security on the part of residents in flood-prone areas should be avoided. Some sacrifice of degree of protection could be tolerable if dictated by environmental or other compelling considerations and if supported by an adequate warning system. Nonstructural measures in combination with lesser degrees of structural protection are acceptable provided that public awareness of the remaining hazard is maintained, an adequate flood forecasting and warning system is included, and appropriate evacuation procedures are developed.

Economic Criteria

The economic criteria require that tangible benefits attributable to projects exceed project costs. Project benefits and costs are reduced to average annual equivalent values and related in a ratio of benefits to costs. This ratio must exceed unity to meet the NED objective. Selected plans, whether structural, nonstructural, or a combination of both, should maximize excess benefits over costs. These criteria are used to develop plans that achieve the objective of NED and provide a base condition for consideration of economically unquantifiable factors that may impact on project proposals.

The effectiveness of structural and nonstructural measures should be evaluated on the basis that all future development within the 100-year frequency floodplain will be built with first-floor elevations at or above the 100-year frequency flood level.

All structural measures and some nonstructural measures for local urban flood protection projects should be evaluated using the appropriate period of analysis and the currently applicable interest rate. Total annual costs should include amounts for operation, maintenance, major replacements, amortization, and interest on the investment as well as interest during construction.

Environmental Criteria

Any plans considered should be formulated to avoid adverse environmental impacts to the maximum extent possible. Where adverse impacts cannot be avoided, measures should be developed to mitigate such effects. The necessity for

developing specific mitigation measures could be reduced by emphasizing the protection, preservation, or enhancement of existing environmental values through project design. Significant resources should be preserved, improved, or restored to the maximum extent possible.

The U.S. Fish and Wildlife Service (USFWS) mitigation policy has established four resource categories that are used to assure that the level of recommended mitigation is consistent with the quality of the fish and wildlife resources involved. Resource Category (RC) I includes the most desirable habitat types and has a mitigation goal of no loss of the existing habitat value. RC IV is the lowest category and includes habitat types of medium to low value with a mitigation goal of minimizing the loss of value.

Social and Other Criteria

Social and other criteria include the identification, protection, and preservation of existing historical, archeological, and cultural resources that might be affected by projects. Plans proposed for implementation should have an overall favorable impact on the social well-being of affected interests and should have overall public acceptance.

Structural and nonstructural alternatives must reflect close coordination with interested Federal and state agencies, the City of Victoria, and the affected public. The effects of these measures on the environment must be carefully identified and compared with technical, economic, and social considerations and evaluated in the light of public preferences.

GENERAL DESCRIPTION OF PRELIMINARY ALTERNATIVES

Various flood control alternatives were investigated to achieve the planning objectives discussed previously. The focus for this feasibility study was to determine the most viable flood control alternative for the Guadalupe River at Victoria study area.

Alternatives for flood damage reduction in urban areas can be divided into two main categories: nonstructural and structural measures. In addition, a "No Action" alternative must be considered in all flood control investigations. The following sections describe the two damage reduction alternatives and the "No Action" alternative.

NONSTRUCTURAL MEASURES

Nonstructural measures attempt to avoid flood damages by exclusion or removal of damageable properties from the flood prone areas. These measures do not affect the frequency or level of flooding within the floodplain; rather, they affect floodplain activities. The technique of controlled land use is particularly helpful in planning for future development, but is of limited use in highly developed areas.

Floodproofing

Floodproofing includes such measures as valving sewer lines, providing watertight coverings for door and window openings, sump pumps to drain seepage, sealing of cracks, steel bulkheads on brick walls (flood shields) to close off entrances, constructing levees and floodwalls around

individual buildings or groups of buildings, and coating walls of structures with a waterproof membrane. Floodproofing is more easily applied to new construction and more applicable where flooding is of short durations, low velocity, infrequent, and shallow depth. Floodproofing is also appropriate in locations where structural flood protection is not feasible or where collective action is not possible. Floodproofing would normally require major modifications to the existing structures. Thus, floodproofing is appropriate only under certain circumstances.

Raising Structures In-Place

This measure attempts to avoid flood damages by elevating damageable property and/or raising existing buildings in-place at least one foot above the 100-year flood level and providing a raised access road and escape route from the structures. Structures on slab foundations are very expensive and often times impractical, to raise in-place.

Permanent Evacuation of the Floodplain

This measure involves the permanent evacuation of people and demolition or relocation of structures above the 100-year floodplain elevation. This alternative is also known as the "Buyout Plan".

Previous studies have shown that evacuation and relocation alternatives are most effective in the 0- to 10-year frequency floodplain. This alternative requires the acquisition of all privately-owned lands, dwellings, and related improvements. The dwellings and structures would be removed, residents relocated to flood-free housing, and the land converted to parks, recreation fields, nature areas, or

other uses consistent with periodic flooding. The benefits of this alternative would be the reduction of emergency costs, administrative costs of disaster relief, flood insurance subsidies, and potential flood damages to public property (such as roads and utilities). In addition, the value of the new use of the vacated land may be claimed as a benefit.

Floodplain Management

Effective floodplain management is dependent on developing enforceable regulations to insure that floodplain uses are compatible with the flood hazard. Several means of regulation are available, including zoning regulations, subdivision regulations, and building codes.

Zoning Regulations - Zoning regulations permit prudent use and development of the floodplain in order to prevent excessive property damage, expenditure of public funds, inconvenience, and, most important the loss of life from flooding.

Subdivision Regulations - Subdivision regulations guide the division of large parcels of land into smaller lots. The regulation requires the subdivision developer to show compliance with subdivision regulations, zoning ordinances, and local land use or master plan. A subdivision regulation with special reference to flood hazards would require installation of adequate drainage facilities, prohibit encroachment in floodway areas, require the placement of critical streets and utilities above a selected flood elevation, require filling of building lots, or require elevating structures above a selected flood elevation, normally one foot above the 100-year floodplain elevation.

Building Codes - Building codes specify the building design and construction materials. They can be used for construction of new buildings or repair of flood-damaged structures. Building codes can reduce damages by setting specifications to require proper anchorage of buildings; restrict materials that deteriorate when exposed to water; require watertightness on exterior walls; require valves on sewer lines; or require placement of certain utilities such as heaters, air conditioners, etc., at elevations that would reduce all flood damages.

Floodplain management would be most effective in controlling future development of the floodplain, thereby assuring that the flood problems do not become worse. However, floodplain management cannot, by itself, significantly alleviate existing flood conditions within a floodplain.

Stormwater Management

Stormwater management (on-site detention) for future basin development is considered the responsibility of non-Federal interests. The Corps of Engineers' interest in the non-Federal implementation of stormwater management would be limited to the possible inclusion of this measure as an item of local cooperation required as part of an overall flood damage reduction plan. Through better management of stormwater and possibly the controlled detention of some stormwater, downstream flood damages caused by peak flood waters can be further minimized.

Flood Forecasting and Temporary Evacuation

Floodwarning and temporary evacuation involve the determination of imminent flooding, implementation of a plan to warn the public, and organization of assistance in evacuation of persons and some personal property. Notification of impending flooding can be by radio, siren, individual notification, or by more elaborate means such as remote sensors to detect water rises and automatically warn residents. These measures normally serve to reduce hazards to life and damage to portable personal property. Flood warning and emergency evacuation are considered as part of any flood control plan.

STRUCTURAL MEASURES

Structural measures are designed to control, divert, or exclude the flow of water from flood-prone areas to the extent necessary to reduce damages to property, hazards to life or public health, and general economic losses. The structural measures most appropriate to dealing with the character of the flood problems encountered in the study area are as follows:

- * Detention Structures
- * Levees and Floodwalls
- * Channel Improvements
- * Floodwater Diversion

Structural measures for flood control will normally produce greater environmental impacts than nonstructural measures. Impacts from structural measures will vary considerably depending on the environmental importance of the affected area and the magnitude of construction.

Construction in undisturbed natural areas will generally have a greater adverse impact than a modification to an existing structure in a previously disturbed stream corridor.

Detention Structures

This measure includes constructing one or more structures or modifying existing structures to provide flood control storage to detain peak flood flows and lessen downstream flood damages. The feasibility of this measure depends heavily on the volume and timing of flood flows and the associated cost of constructing/modifying an existing embankment and spillway. Additional costs would be incurred to mitigate for adverse environmental impacts.

Levees and Floodwalls

Levee systems traditionally provide high levels of protection to flood prone areas; but, they require substantial amounts of real estate between the stream and the structures being protected, unless an existing levee is in place and only a small strip of real estate is required. Floodwalls (usually made of concrete) are used in place of levees in situations where the acquisition of real estate for the levee or other topographic considerations may be cost prohibitive. The feasibility of either measures is based on the cost and availability of real estate, the number of structures along the proposed alignment, and the additional costs necessary to alleviate interior drainage problems to prevent induced damages in adjacent areas. Construction of individual levees or floodwalls around specific structures or small groups of structures is normally considered cost prohibitive unless the individual structure is very valuable

and/or has cultural significance and is prone to frequent flooding.

Channel Improvements

This measure involves constructing a new channel or modifying an existing channel by:

- a. Reducing the friction losses of an existing channel through concrete lining;
- b. Straightening and realigning the stream channel; or
- c. Increasing the cross-sectional area of the stream channel.

Floodwater Diversion

This measure involves construction of improvements to auxiliary channels through which excess flows can be directed by means of gates or other water control features.

NO ACTION

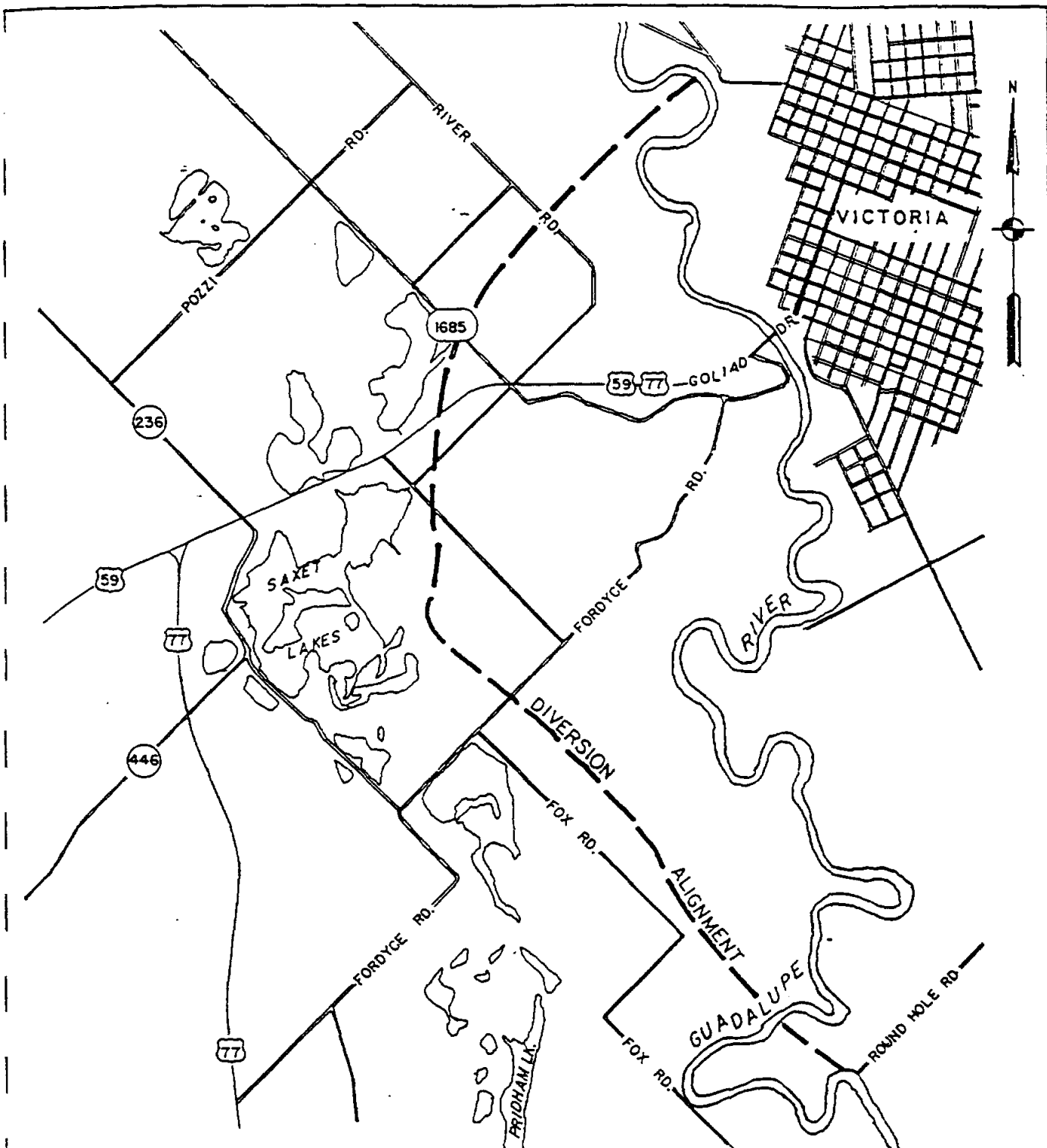
A final alternative in any flood control protection investigation is the "No Action" alternative. Adoption of this alternative implies acceptance of the existing and future flood damages and other adverse impacts caused by continued flooding. The "No Action" alternative would recommend that no nonstructural or structural plan(s) be implemented and would require no expenditure of Federal funds.

DESCRIPTION AND ANALYSIS OF PRELIMINARY STRUCTURAL ALTERNATIVES INVESTIGATED

The following paragraphs describe the preliminary structural alternatives investigated and their ability to address the study area's problems and needs. The baseline condition for each of these alternatives assumes 1998 land use conditions and applicable criteria are in effect. For screening purposes, the annual costs for the investigated alternatives is based on June 1995 price levels, a Federal discount interest rate of 7-3/4 percent, and a 50-year amortization period.

DIVERSION CHANNEL

A channel to divert water from the Guadalupe River upstream of Victoria and back into the river just north of Highway 175 was analyzed. The alignment chosen for the analysis is shown on Figure 4. Two diversion channel plans were analyzed using the same alignment. The first plan was designed to contain the 100-year flood (179,000 cfs) within banks. This plan would require a channel with a bottom width of 1,300 feet. The second plan was designed with a channel bottom width of 200 feet. The second plan would contain the 5-year flood, but would require a levee on the downstream side of the diversion channel to divert most of the flood waters.



SCALE IN FEET
 1000 0 1000 2000

LEGEND

----- DIVERSION ALIGNMENT

GUADALUPE RIVER AT
 VICTORIA, TEXAS
 DETAILED PROJECT REPORT
 RIVER DIVERSION
 ALIGNMENT

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

FIGURE 4

The 1,300-foot bottom width channel plan was estimated to cost \$341,000,000 and the 200-foot bottom width channel with the levee was estimated to cost approximately \$42,000,000. Neither of the diversion channel plans provide an economically feasible solution to the flooding problem.

BRIDGE ENLARGEMENT

Analyses of the Guadalupe watershed west of the river indicate that once the floodwater in the river exceeds the capacity of the channel, most of the floodwater flows overland west of Green Subdivision through the Saxet Lakes area. A hydraulic analysis determined that bridge openings on U.S. Highway 59 and the railroad equaling approximately twice the existing area would be needed to pass the floodwater underneath the structures without raising the elevation of the floodwater.

Four new highway bridges and two new railroad bridges would be required to prevent most damages. This plan would cost in excess of \$13,000,000. This estimate does not include any channelization to direct the water through the bridges nor does it include any cost to increase the flow area under Loop 175 south of Victoria.

GREEN SUBDIVISION RING LEVEE

Green Subdivision, also referred to as the Green Addition, is located on the west side of the Guadalupe River and north of U.S. Highway 59. A study of this area was added to the overall analysis after local residents expressed concern about flooding that occurs in the subdivision. They further questioned the effect that construction of the levee would have on the west side of the river.

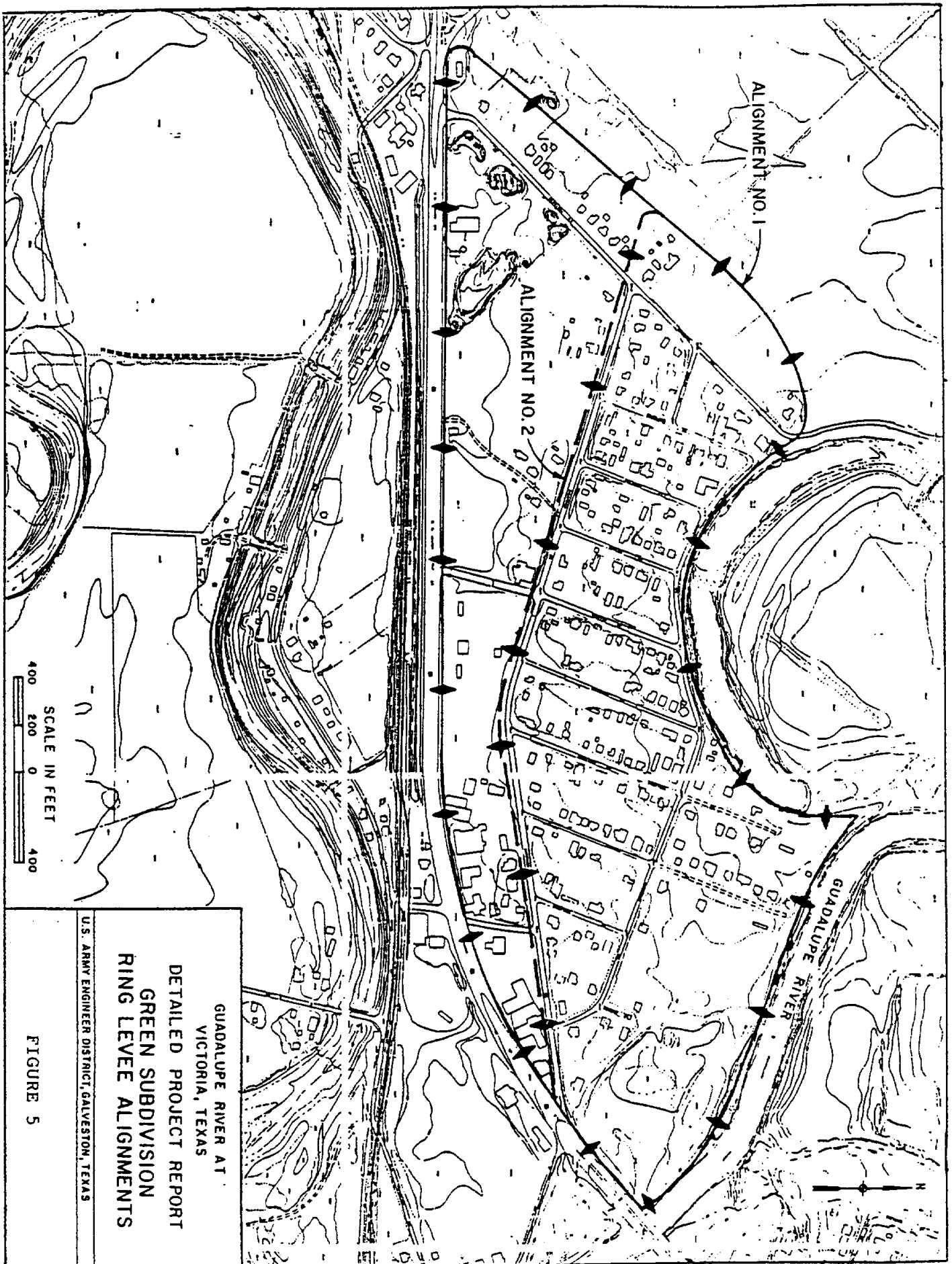
A ring levee was designed to prevent flooding of the Green Subdivision. The computed 100-year water surface elevation plus three feet for freeboard was used to determine the height of the ring levee. The 100-year flood elevation for the Guadalupe River near Green Subdivision was computed to be 61.7 feet NGVD. Two alignments were investigated as shown on Figure 5. The first alignment protects the subdivision from Rhinegold Street on the north side of the subdivision to U.S. Highway 59 on the south side. This alignment reduces the estimated annual damages by \$165,000. The first cost for this plan is \$2,083,000 with annual costs of \$180,000 and a benefit-to-cost ratio of 0.9.

The second alignment for the ring levee protects the subdivision from Rhinegold Street on the north side to Seigfried Street on the south side. This alignment reduced the estimated annual damages by approximately \$114,000. The estimated first cost of this plan is \$1,800,000, resulting in annual costs of \$155,600 and a benefit-to-cost ratio of 0.7.

A plan that provided protection from a flood less than the 100-year frequency might be feasible. However, since any degree of protection less than the 100-year level would not meet the local requirements, the city would not support the plan.

VICTORIA LEVEE ALTERNATIVES

Various levee alignments were studied. Seven levee designs were developed to provide protection for the city from the 25-, 50-, 100-, 150-, 217-, 250-, and 500-year floods. The plans would incorporate the construction of a new sheet pile wall at the Central Power and Light (CP&L)



GUADALUPE RIVER AT
 VICTORIA, TEXAS
 DETAILED PROJECT REPORT
 GREEN SUBDIVISION
 RING LEVEE ALIGNMENTS

U.S. ARMY ENGINEER DISTRICT, GALVESTON, TEXAS

FIGURE 5

plant into the existing levee structure, incorporate an improved levee system over the existing levee structure, and extend the existing levee at both ends. The levee alignment is shown on Figure 6. All seven plans would produce benefits in excess of costs. An economic evaluation, involving an economic risk and uncertainty analysis, for these plans is found in Appendix B.

SCREENING OF ALTERNATIVES

The economic analysis conducted during 1991 evaluated a buyout plan for the 10-year floodplain. This plan involved the purchase and demolition of 331 homes and relocation of the residents out of the 10-year floodplain. The first cost of this alternative was estimated to be \$24,192,000, which equated to an annual cost of \$2,101,000. The average annual benefits of \$1,368,000 result in a benefit-to-cost ratio of 0.65. Buyout plans of the 100-year floodplain would involve the purchase and demolition of 424 homes and relocation of residents out of the 100-year floodplain. The first cost of this alternative is approximately \$44,953,000, which equates to an annual cost of \$3,899,000. The average annual benefits are \$1,781,000, which results in a benefit-to-cost ratio of 0.46. Therefore, neither buyout alternative is economically feasible.

Raising structures in-place was analyzed for the structures in the 10- and 100-year floodplains. The 10-year floodplain would require elevating 331 homes, which would cost approximately \$8,937,000. This cost does not include any modification to the access roads into the area. Raising the structures would result in an annual cost of \$772,000 and the associated annual benefits were estimated at \$853,000, producing a benefit-to-cost ratio of 1.1. The 100-year floodplain required elevating 424 homes resulting in a cost of approximately \$11,448,000. This cost does not include any modification to the access roads into the area. Raising the structures in the 100-year floodplain would result in an annual cost of \$989,000. Annual benefits were estimated at \$1,152,500, producing a benefit-to-cost ratio of 1.16. If the costs of providing access were added to the plans, the resulting benefit-to-cost ratios would be much lower. Both

alternatives were eliminated from further consideration because of their high cost, particularly in comparison to the levee alternative.

No economically feasible nonstructural plans were identified. Of the structural plans investigated, only the seven levee alternatives were found to have economic justification. Economic evaluation with risk and uncertainty analysis of the seven levee alternatives is discussed below.

ECONOMIC EVALUATION OF LEVEE ALTERNATIVES

The principal purpose of the economic evaluation incorporating risk and uncertainty analysis was to identify the plan of improvement that would provide the maximum excess benefits over costs. In order to accomplish this, it was necessary to:

- a. Determine the magnitude of the existing flood problem;
- b. Estimate the benefits that would accrue to the improvement plan; and
- c. Ascertain whether conditions in the study area would change sufficiently to influence the damages and, therefore, the benefits over the economic life of the project.

The economic analysis followed the procedures set forth in the Water Resources Council's Economic and Environmental Principles and Guidelines of March 1983. Plans formulated to provide for flood protection and other water resource needs should be designed to make the maximum possible contribution to the National Economic Development (NED) account and be consistent with protecting the Nation's environment as established in the PP&G.

The assumptions and framework incorporated into the economic analysis for the levee alternatives are as follows:

- a. Estimates of existing flood damages and benefits reflect June 1995 prices and level of development.

b. The year 1998 is assumed to be the first year of operation for the plans investigated.

c. A 50-year project life was assumed, extending from 1998 to 2048.

d. Probable future conditions considered potential changes in hydraulic and floodplain development from 1998 through 2048.

e. A Federal interest rate of 7-3/4 percent was applied to convert the undiscounted future damages and benefits to average annual equivalent values.

FREQUENCY-DAMAGE CALCULATIONS

Using the water surface profiles, the depth of water for each structure (within the SPF) was calculated for the 500-, 300-, 100-, 50-, 25-, 10-, 5-, and 2-year flood events. These depths were combined with depth-damage curves and real estate values to estimate damages. Damages to the various structures were then summed by frequency to produce a frequency-damage function.

RISK AND UNCERTAINTY ANALYSIS

The risk and uncertainty analyses used to derive average annual damages. Average annual damages are derived using a risk framework. The risk analysis framework is an approach to evaluation and decision making that incorporates the considerations of risk and uncertainty. A Latin Hypercube template and the @Risk program (Palisade Corporation) integrated the hydrology, hydraulics, and economic variables and standard deviations into a sampling technique for the

risk and uncertainty analysis. This technique provided the repeated simulations necessary for the probabilistic nature of the derived distributions without replacement. It also formed the basis for the stage-damage curve which was used to determine damages and benefits of alternative levee plans. As shown in Table 4 of Appendix B, the total average annual flood losses in the study area are estimated to be \$2,676,000 based on June 1995 prices of which \$1,224,000 are attributable to residential properties.

WITH-PROJECT CONDITIONS

Plans Investigated

Seven levee design alternatives were addressed during the economic analysis, including the 25-, 50-, 100-, 150-, 217-, 250-, and 500-year flood protection designs.

Estimates of Annual Benefits

Average annual benefits were determined by subtracting residual flood losses from the "without project" losses. Since significant future changes in watershed hydrology and growth are not anticipated, benefits to existing development are assumed to remain constant over time. Tables 5 through 11 of Appendix B display the existing annual damages, residual damages for the particular levee plan, and resultant flood damage reduction benefits. Benefits for the alternative plans are summarized in Table 7.

TABLE 7

AVERAGE ANNUAL DAMAGES TO EXISTING DEVELOPMENT WITH
AND WITHOUT THE PLANS OF IMPROVEMENT
(JUNE 1995 PRICES AND LEVEL OF DEVELOPMENT VALUES IN \$1,000)

PLAN	FLOOD DAMAGES WITHOUT PROJECT	RESIDUAL DAMAGES WITH PROJECT	FLOOD REDUCTION BENEFITS WITH PROJECT	PERCENT DAMAGE REDUCTION
25-YEAR	\$2,676	\$862	\$1,814	67.80%
50-YEAR	2,676	602	2,074	77.51
100-YEAR	2,676	473	2,203	82.33
150-YEAR	2,676	403	2,272	84.92
217-YEAR	2,676	374	2,302	86.02
250-YEAR	2,676	361	2,314	86.49
500-YEAR	2,676	340	2,336	87.31

Benefit-Cost Comparisons and NED Plan Selection

Average annual benefits, average annual costs, net average annual benefits, and benefit-to-cost ratios were analyzed for the 25-, 50-, 100-, 150-, 217-, 250-, and 500-year levels of protection plans and are presented in Table 8. The NED plan is the 250-year level of protection, the plan with the greatest net excess benefits over cost.

TABLE 8

SUMMARY OF ECONOMIC EVALUATION
(JUNE 1995 PRICES AND VALUES IN \$1,000)

PLAN OF PROTECTION	AVERAGE ANNUAL COSTS	AVERAGE ANNUAL BENEFITS	NET ANNUAL BENEFITS	BCR
25-YEAR	\$749	\$1,814	\$1,065	2.42
50-YEAR	760	2,074	1,314	2.73
100-YEAR	777	2,203	1,426	2.84
150-YEAR	813	2,272	1,459	2.79
217-YEAR	825	2,302	1,477	2.79
250-YEAR	833	2,314	1,481	2.78
500-YEAR	872	2,336	1,464	2.68

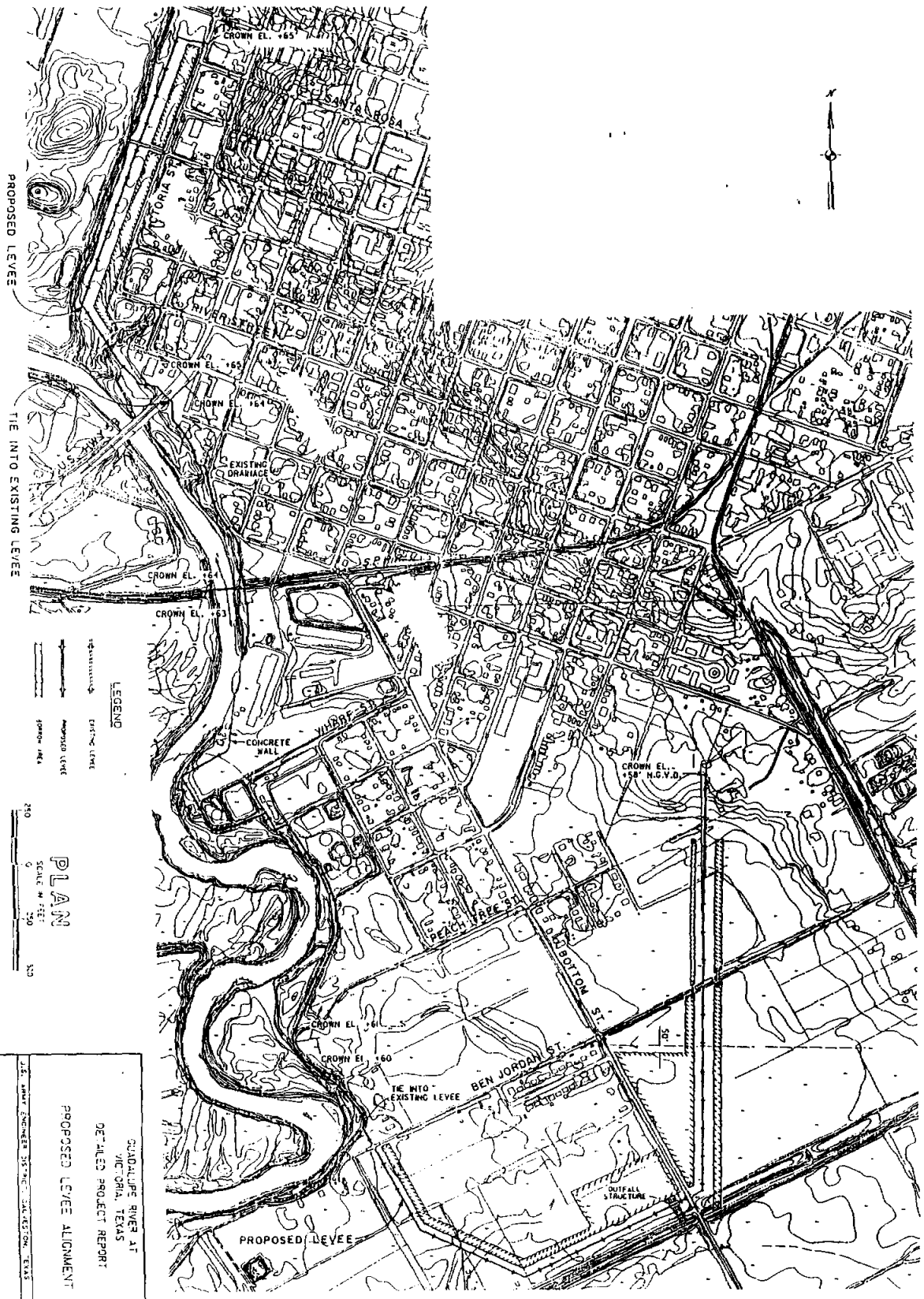
PLAN SELECTION

As noted from Table 8 above, there is a small difference in net excess benefits over costs between the plans affording 100-year to 500-year protection. The 250-year plan is the NED plan because it has \$4,000 more average annual excess benefits than the 217-year plan and likewise, the 217-year plan has \$51,000 more excess benefits than does the 100-year plan. The levee plans investigated from the 100-year plan through the 250-year plan all have benefit-cost ratios of 2.8. This indicates that the additional costs of protection are being offset by benefits at a rate of 2.8 times the cost. A plot of these values would indicate a relatively flat curve.

Coordination with the local sponsor, revealed that its main interest was to minimize costs, maximize protection, and qualify for FEMA's Flood Insurance Program. The 100-year plan would not satisfy the sponsor's requirement because the plan does not have adequate freeboard to provide protection against the 100-year storm as defined by FEMA. FEMA requires a minimum of 3 feet of freeboard above the protection provided for the 100-year storm. The 217-year plan would satisfy the sponsor's needs and is therefore, the locally preferred plan. Since the 217-year plan is less costly than the NED plan and still satisfies all technical, economic, and environmental requirements, it is the Selected Plan.

DESCRIPTION OF THE SELECTED PLAN

The local sponsor has stated a preference for the 217-year plan over the NED plan because of its smaller construction cost. The selected plan incorporates a large portion of the existing levee alignment and structure, includes the construction of a new sheet pile wall at the CP&L plant, extends upstream and downstream from the ends of the existing levee to high ground, and has elevation sufficient to prevent flanking by floodwaters. The upstream end of the proposed levee system would begin at high ground near the intersection of Santa Rosa and Victoria Street and extend in a generally southerly (downstream) direction along the river bank, crossing U.S. Highway 59 to the beginning of the existing levee embankment. The proposed alignment would then follow the existing levee alignment crossing the Southern Pacific Railroad, incorporates the new sheet pile wall at the CP&L plant, and follows the existing levee alignment to approximately Ben Jordan Street. The proposed alignment would continue southeasterly crossing Ben Jordan Street, then loop back to the east and north to high ground near the intersection of South and East Streets. This proposed alignment is shown in Figure 6.



PROPOSED LEVEE
TIE INTO EXISTING LEVEE

- LEGEND**
- PROPOSED LEVEE
 - EXISTING LEVEE
 - CONCRETE WALL
 - OUTFALL STRUCTURE

250
0
250
500

PLAN
SCALE IN FEET

QUADELUPE RIVER AT
VICTORIA, TEXAS
DETAILED PROJECT REPORT
PROPOSED LEVEE ALIGNMENT
FIGURE 5

OPERATION AND MAINTENANCE

The major items required for operation and maintenance of completed projects include mowing and fertilizing of turfed areas, periodic cleanout of channels and subdrainage systems, and erosion repair. The annual costs for operation and maintenance of completed projects reflect these types of activities and are consistent with similar Federal projects in the area.

It was assumed that mowing would be performed twice a year; greasing and testing the gates, levee repairs, and ramp repairs would be performed annually; silt and debris would be removed from the levee and ponding areas every two years; and the entire area would be seeded, mulched and fertilized every five years. The cost of performing these items of operation and maintenance is shown in Appendix K.

The local sponsor will be responsible for and bear the full costs of operating and maintaining the project upon completion of construction in accordance with regulations prescribed by the Secretary of the Army.

REAL ESTATE

Authorized projects require the local sponsor to furnish all lands, easements, rights-of-way, relocations, and disposal areas (LERRD) necessary for construction without cost to the Federal Government. A complete discussion of the Real Estate requirements is found in Appendix F.

LAND, EASEMENTS, AND RIGHT-OF-WAY REQUIRED

Rights to be acquired for the project consist of permanent easements as described in the following paragraphs:

a. Levee Right-of-Way. The required acreage for proposed levee construction consists of approximately 33.1 acres of land. The minimum acreage required for levee construction is a perpetual flood protection levee easement.

b. Borrow Areas. Approximately 22.7 acres of proposed land are required for borrow areas. The borrow areas will be used for ponding. The minimum estate required for borrow areas is permanent easement.

c. Construction Access. No additional right-of-way will be needed for access. Existing roads and streets will be used to gain access to the project site.

d. Recreational Features. No real estate interests will be required for this project.

e. Mitigation. No real estate interests will be required for this project.

RELOCATION ASSISTANCE

No persons, farms, or businesses will be displaced by this project. There are no anticipated bridge or pipeline relocations.

ESTIMATED VALUATION

Real estate cost estimates include estimates for lands and damages and allowances for contingencies. Fifty ownerships will be affected by the acquisition of land. Total real estate costs are estimated to be \$520,000. A detailed summary and breakdown of these costs can be found in Appendix F.

The local sponsor is responsible for the relocation or alteration of all roadway bridges, pipelines, and utilities necessitated by the construction of the project. The Federal Government is responsible for relocations or alterations to railroad bridges. Specific details of the relocations for this project are discussed in the following paragraphs.

RAILROAD BRIDGE RELOCATION

A single-track of the Southern Pacific Transportation Company bridge crosses the levee at the north end. The railroad elevation is adequate for 100-year design, since no closure structure is required. The proposed levee will tie into the railroad bridge embankment on both sides. Concrete pipes with slide gates or flap gates will be constructed on both sides of the railroad embankment. A relocation contract will be required for the work on railroad property.

ROADWAY BRIDGE RELOCATIONS

No roadway bridges will be relocated. The only bridge impacted will be at U.S. Highway 77 where the levee will tie into the bridge embankment.

PIPELINES AND UTILITY RELOCATIONS

The pipelines and utilities shown in Table 9 are known to cross the proposed levee or existing levee. The table gives the type of pipeline or utility, location, owner, type of crossing, and type of alteration required. The locations of pipelines and utilities are shown on the attached plates. Additional pipelines and utilities may be identified in subsequent investigations during preparation of plans and specifications and acquisition of rights-of-way. The local sponsor will be responsible for coordinating with pipeline and utility owners in making final determinations for all pipeline and utility relocations. Pipeline and utility relocation activities and costs are the responsibility of the local sponsor.

TABLE 9

PIPELINE AND UTILITY RELOCATION
REQUIREMENTS FOR THE SELECTED PLAN

Station	Owner	Description	Alteration Proposed
5+80	Central Power & Light	Overhead Electric	None
15+60	Central Power & Light	Overhead Electric	Raise Line
15+60	SW Bell Telephone	Overhead Telephone	Raise Line
15+60	TCA Cable TV	Television Cable	Raise Line
19+90	Delhi Gas Pipeline Corp.	12" Pipeline	None
30+90	Central Power & Light	Overhead Electric	Raise Line
32+11	SW Bell Telephone	Buried Cable	Relocate Junction Box
58+20	SW Bell Telephone	Buried Cable	Relocate Junction Box
58+20	Central Power & Light	Overhead Electric	Raise Line
70+50	Houston Pipeline Co.	18" Pipeline	None
97+00	Delhi Gas Pipeline Corp.	12" Pipeline	None
111+70 to 118+40	Central Power & Light	Overhead Electric	Relocate Line

MISCELLANEOUS STRUCTURES

Several miscellaneous structures will be affected by the levee and will require removal and/or relocation or reinstallation. These include a chain link fence, a barbed wire fence, and an overflow drainage chute at the sanitary sewer plant.

COST ESTIMATE

Detailed cost estimates were prepared using the micro-computer aided cost estimating system (MCASES). MCACES estimates were provided for the NED Plan (250-year storm) and the Selected Plan (217-year storm). These estimates include relocations, levees, floodwalls, and shoreline protection. The 1995 Unit Price Book database was used with labor rates adjusted to the latest available data for the Victoria County area. The quantities for levees, floodwalls, relocations, and shoreline protection were developed for screening the alternative plans. A summary of the detailed cost estimate, based on June 1995 prices, is shown on Table 10.

TABLE 10

ESTIMATED COST OF THE SELECTED PLAN		
ACCOUNT CODE		TOTAL COST
NON-FEDERAL PROJECT COSTS		
01	Lands & Damages	\$604,648
02	Relocations	<u>471,601</u>
	Subtotal	1,076,249
	Additional Cash Contribution	<u>3,272,246</u>
	TOTAL NON-FEDERAL PROJECT COSTS	\$4,348,495

FEDERAL PROJECT COSTS		
01	Lands & Damages	\$108,644
02	Levees & Floodwalls	7,302,485
30	Engineering & Design	560,417
31	Construction Management	<u>300,700</u>
	Subtotal	8,272,246
	Non-Federal Contribution	<u>3,272,246</u>
	TOTAL FEDERAL PROJECT COSTS	\$5,000,000
	TOTAL PROJECT COST	\$9,348,495

PLAN ACCOMPLISHMENTS

Table 11 displays the benefits that would accrue to the selected plan (217-year) by damage category. Total benefits accruing to this plan would amount to \$2,302,000 annually.

TABLE 11

AVERAGE ANNUAL EQUIVALENT BENEFITS
BY DAMAGE CATEGORY FOR 217-YEAR LEVEE PLAN
(VALUES IN \$1,000)

DAMAGE CATEGORY	BASELINE DAMAGES	DAMAGES WITH PLAN	DAMAGES REDUCED
Residential	\$1,224	\$307	\$971
Public	27	3	25
Commercial	77	8	68
Industrial	1	1	0
Other Flood Costs	571	23	547
Utilities	12	0	11
Vehicles	751	31	721
Roads	<u>13</u>	<u>1</u>	<u>12</u>
TOTALS	\$2,676	\$374	\$2,302

SUMMARY OF BENEFITS AND COSTS

Total investment and annual charges for the selected plan are displayed in Table 12.

TABLE 12

SUMMARY OF ANNUAL COSTS AND BENEFITS FOR 217-YEAR LEVEE PLAN (VALUES IN \$1,000)

CONST PERIOD (YR)	FIRST COST	INTEREST DURING CONSTRUCTION	TOTAL INVESTMENT COST	OPERATION AND MAINTENANCE	ANNUAL AVERAGE COSTS	ANNUAL AVERAGE BENEFITS	BENEFIT TO COST RATIO
1	9,349	73	9,495	20	825	2,302	2.79

PLAN IMPLEMENTATION

DIVISION OF PLAN RESPONSIBILITIES

The local cost-sharing sponsor for the Guadalupe River at Victoria, Texas, project is the City of Victoria. Coordination with the city has been continuing during preparation of this Detailed Project Report and will continue through preparation of plans and specifications and project implementation. A summary of the requirements of local cooperation is presented in the following paragraphs.

The local sponsors are required to provide all lands, easements, rights-of-way, disposal areas, and all relocations or alterations of buildings, utilities, bridges (except railroad bridges), roads, sewers, pipelines, and other alterations of existing improvements that may be necessary for the construction of the improvements described in this report. The local sponsor will also bear the costs of operating and maintaining the project upon completion of construction in accordance with regulations prescribed by the Secretary of the Army.

NON-FEDERAL CASH CONTRIBUTION

In addition to the above, the local sponsor is required to provide a cash contribution during the construction period of not less than 5 percent of the total project costs or \$467,425 directly related to construction. These total project costs include, but are not limited to, actual construction costs (including railroad bridge relocation costs); the value of lands, easements, and rights-of-way; relocation and alteration costs; costs of applicable

engineering and design; and supervision and administration costs.

Under current policy, cost sharing on flood control projects varies in accordance with the value of the required local cooperation. If the costs of Lands, Easements, Rights-of-way, Relocations, and Disposal Areas (LERRD) are greater than 20 percent of the total project costs, the non-Federal share is limited to the provision of the LERRD plus the 5 percent cash contribution. The total cost for the Selected Plan is \$9,348,495, 20 percent of the total cost is \$1,867,700, and total Non-Federal cost for LERRD is \$1,076,249. Therefore, the local sponsor's cost on LERRD does not exceed the 20 percent value of the total project cost.

If the LERRD costs are less than 20 percent of the total project costs, the non-Federal share including the LERRD is limited to 25 percent of the total project costs, if paid during the construction period. For this particular project, the local sponsor's share would be limited to \$2,337,124.

However, the Federal limit for all study and project costs under Section 205 is \$5,000,000 and the local sponsor must provide the additional funding above the Federal cost limit. The total cost for the project is estimated to be \$10,367,600. Therefore, the costs are apportioned \$5,000,000 Federal and \$5,367,600 non-Federal. The non-Federal share is composed of credit for LERRD's of \$1,076,249 and a cash contribution of \$4,291,400.

PROJECT COOPERATION AGREEMENT

A project cooperation agreement (PCA) between the Department of the Army and the City of Victoria, as shown in Appendix K, was reviewed by the city. The approved and executed PCA will be submitted as soon as the city completes its review. A "Letter of Intent" has been signed by the city and is displayed in Appendix M.

FINANCIAL ANALYSIS

The City of Victoria is capable of sponsoring the non-Federal portion of the proposed project construction. The statement of financial capability and financial analysis for the City of Victoria is presented in Appendix L. A letter from the City of Victoria stating how it intends to finance the project is included in Appendix M.

SCHEDULE FOR DESIGN AND CONSTRUCTION

Construction activities for this project will be accomplished by one Federal construction contract over a period of about 1 year. The proposed schedule for design and construction is as follows:

Contract No. 1, Construction of levee:

Submit Plans & Specifications	June 1996
Advertise for Bids	June 1998
Award Contract	July 1998
Construction Period	July 1998 - September 1999

TOTAL CONSTRUCTION PERIOD 1.25 years

STUDY PARTICIPATION AND COORDINATION

Coordination was maintained during the study with state and local government officials, the news media, and groups that identified as having environmental concerns. Coordination was conducted with the U.S. Fish and Wildlife Service (USFWS) and included analyzing the fish and wildlife problems and needs for the area. The Texas SHPO was advised of a potential cultural resource site near the proposed levee alignment that was determined not to be significant. Local real estate companies were contacted to verify land sales in the area. A public workshop was held at the beginning of the feasibility phase (March 5, 1991), and numerous county officials and the public were informed of the status and intent of the study.

RECOMMENDATIONS

There is a Federal interest in this project as determined by the results of engineering, economic, and environmental studies performed as part of this study.

The local sponsor supports the project and is capable of financing its share of the costs and maintaining the completed project throughout the project life.

It is recommended that the project described in this report be constructed in accordance with the proposed Project Cooperation Agreement.

This recommendation reflects the information available at this time and current Department policies governing formulation of individual projects. It does not reflect program and budgeting priorities inherent in the formulation of a national Civil Works construction program. Consequently, the recommendation may be modified. However, the sponsor, the state, interested Federal agencies, and other parties will be advised of any modifications and will be afforded an opportunity to comment further.

16 Oct 95



ROBERT B. GATLIN
Colonel, Corps of Engineers
District Engineer

GUADALUPE RIVER AT VICTORIA, TEXAS
DETAILED PROJECT REPORT
(Victoria Levee)

Section 205 Small Flood Control Project

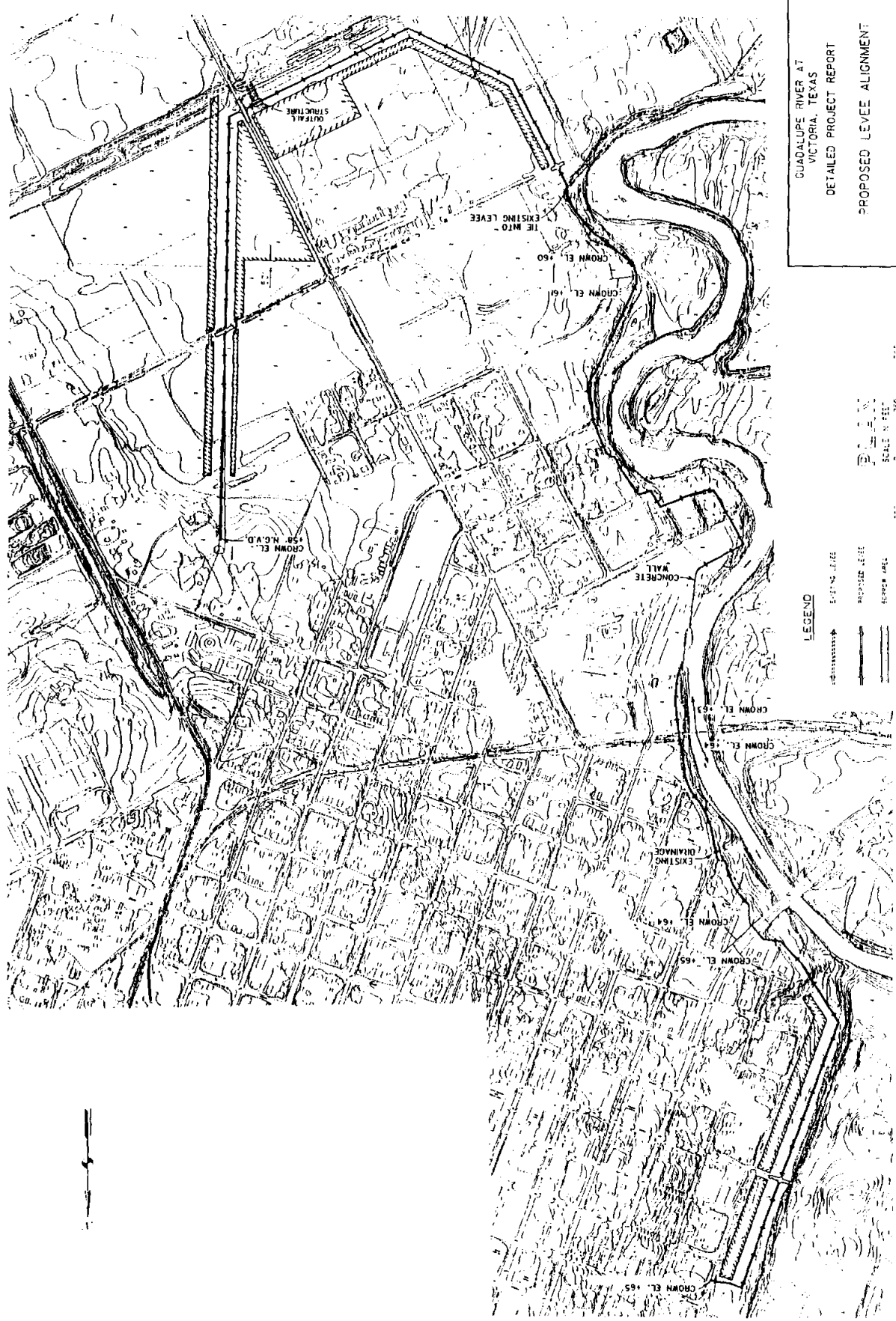
PLATES

GUADALUPE RIVER AT VICTORIA, TEXAS
DETAILED PROJECT REPORT
(Victoria Levee)

Section 205 Small Flood Control Project

List of Plates

<u>Plate No.</u>	<u>Title</u>
1	Proposed Levee Alignment
2	Plan and Profile Sta. 154+60 to Sta. 151+00
3	Plan and Profile Sta. 151+00 to Sta. 144+60
4	Plan and Profile Sta. 144+60 to Sta. 138+80
5	Plan and Profile Sta. 138+80 to Sta. 132+00
6	Plan and Profile Sta. 132+80 to Sta. 125+60
7	Plan and Profile Sta. 125+60 to Sta. 119+40
8	Plan and Profile Sta. 119+40 to Sta. 113+00
9	Plan and Profile Sta. 113+00 to Sta. 106+50
10	Plan and Profile Sta. 106+50 to Sta. 119+40
11	Plan and Profile Sta. 100+40 to Sta. 94+30
12	Plan and Profile Sta. 94+60 to Sta. 88+40
13	Plan and Profile Sta. 88+40 to Sta. 81+50
14	Plan and Profile Sta. 81+50 to Sta. 75+00
15	Plan and Profile Sta. 75+00 to Sta. 68+30
16	Plan and Profile Sta. 68+30 to Sta. 61+40
17	Plan and Profile Sta. 61+40 to Sta. 54+50
18	Plan and Profile Sta. 54+50 to Sta. 47+50
19	Plan and Profile Sta. 47+50 to Sta. 41+60
20	Plan and Profile Sta. 41+60 to Sta. 35+00
21	Plan and Profile Sta. 35+00 to Sta. 28+10
22	Plan and Profile Sta. 28+10 to Sta. 21+50
23	Plan and Profile Sta. 21+50 to Sta. 14+90
24	Plan and Profile Sta. 14+90 to Sta. 8+30
25	Plan and Profile Sta. 8+30 to Sta. 1+80



GUADALUPE RIVER AT
 VICTORIA, TEXAS
 DETAILED PROJECT REPORT
 PROPOSED LEVEE ALIGNMENT
 U.S. ARMY ENGINEER DISTRICT, PALVESTON, TEXAS

LEGEND

- EXISTING LEVEE
- PROPOSED LEVEE
- CONCRETE WALL
- EXISTING DRAINAGE

SCALE 1" = 100'



MATCH LINE STA. 154+00

SANTA ROSA ST.

30'

BORROW AREA NO. 3

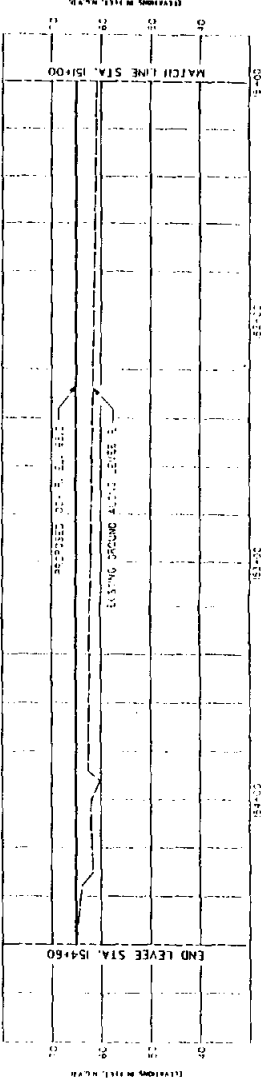
EXCAVATION BOTTOMS
ELEVATION

END LEVEE
STA. 154+60

VICTORIA ST.

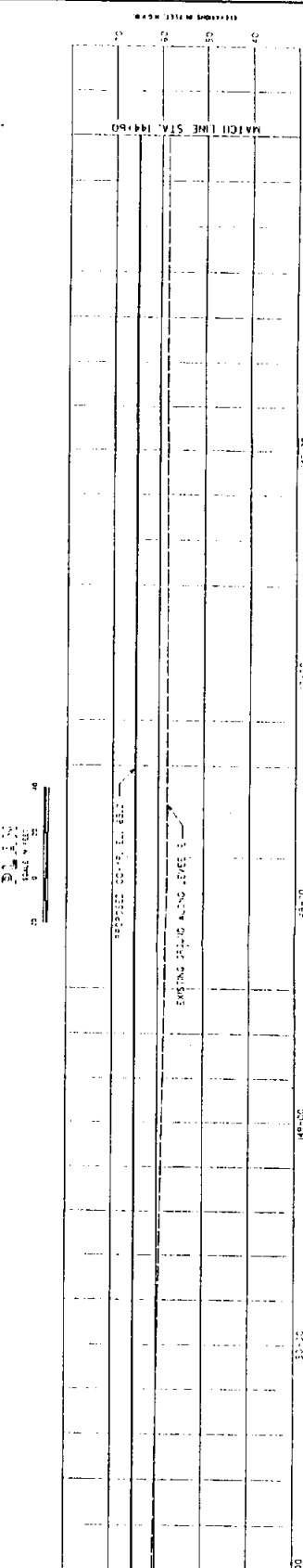
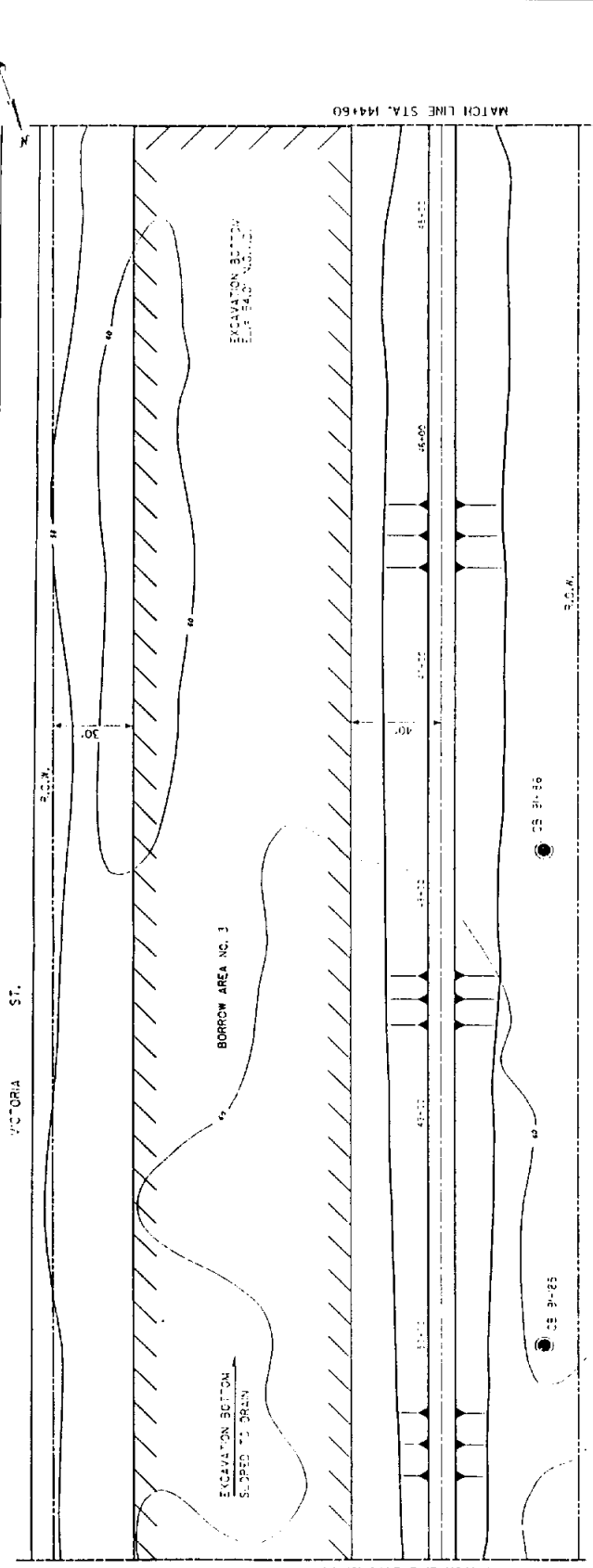
PROPOSED 12" BOTTOM DRAINAGE DITCH

P.O.M.



SCALE
1" = 10'

U.S. ARMY CORPS OF ENGINEERS WATERWAYS DIVISION NEW ORLEANS, LOUISIANA		PROJECT NO. 154-151-00	
DRAWN BY: [Name]		CHECKED BY: [Name]	
DATE: [Date]		SCALE: [Scale]	
PLAN AND PROFILE STA. 154+60 TO STA. 151-00			
Prepared in accordance with the instructions of the Chief Engineer, District Office, New Orleans, Louisiana.			
District Engineer			



STATION	EXISTING ELEVATION (FEET)	PROPOSED ELEVATION (FEET)
151+00	38.00	38.00
150+00	38.50	38.50
149+00	39.00	39.00
148+00	39.50	39.50
147+00	40.00	40.00
146+00	40.50	40.50
145+00	41.00	41.00
144+60	41.50	41.50

U.S. OFFICE OF THE DISTRICT ENGINEER
 DISTRICT OF COLUMBIA
 DIVISION OF HIGHWAYS

DETAILED PROJECT REPORT
 PLAN AND PROFILE
 STA. 151+00 TO STA. 144+60

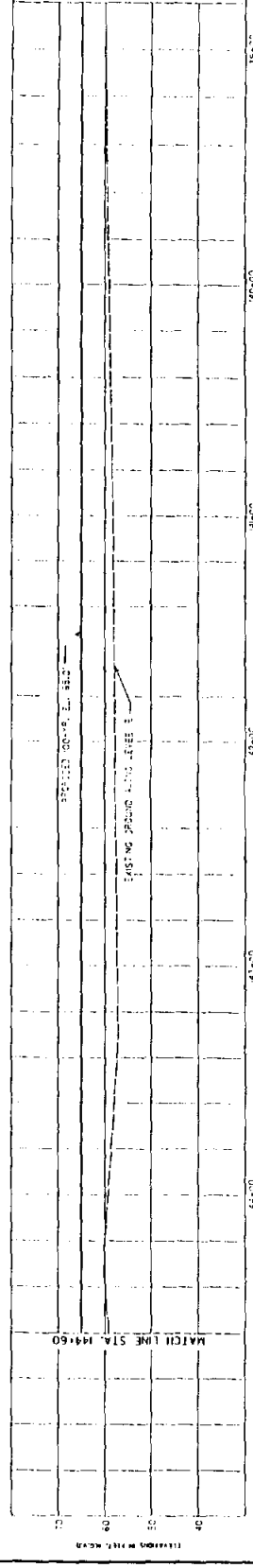
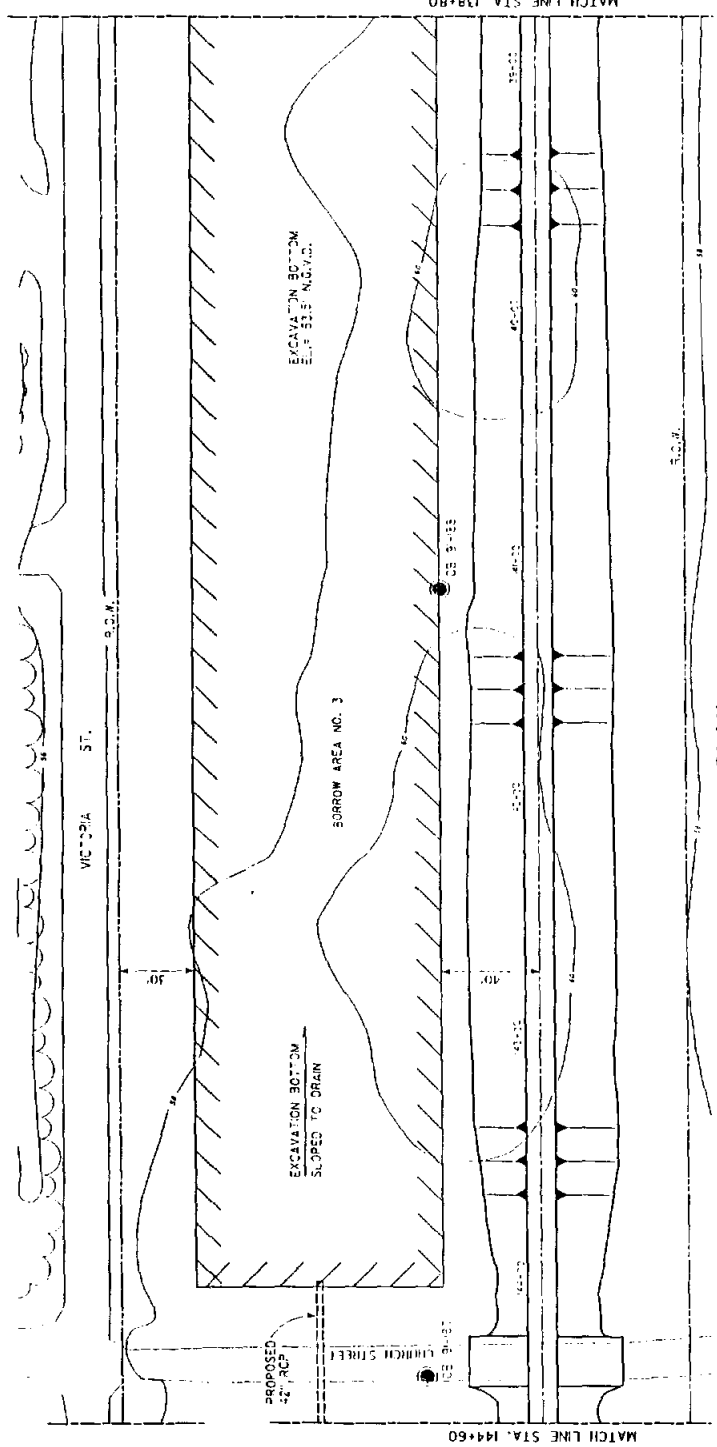
Prepared under the direction of
 District Engineer, D.C.E.

DATE: 10/15/54

BY: [Signature]

SCALE: 1" = 40'

PLATE 2



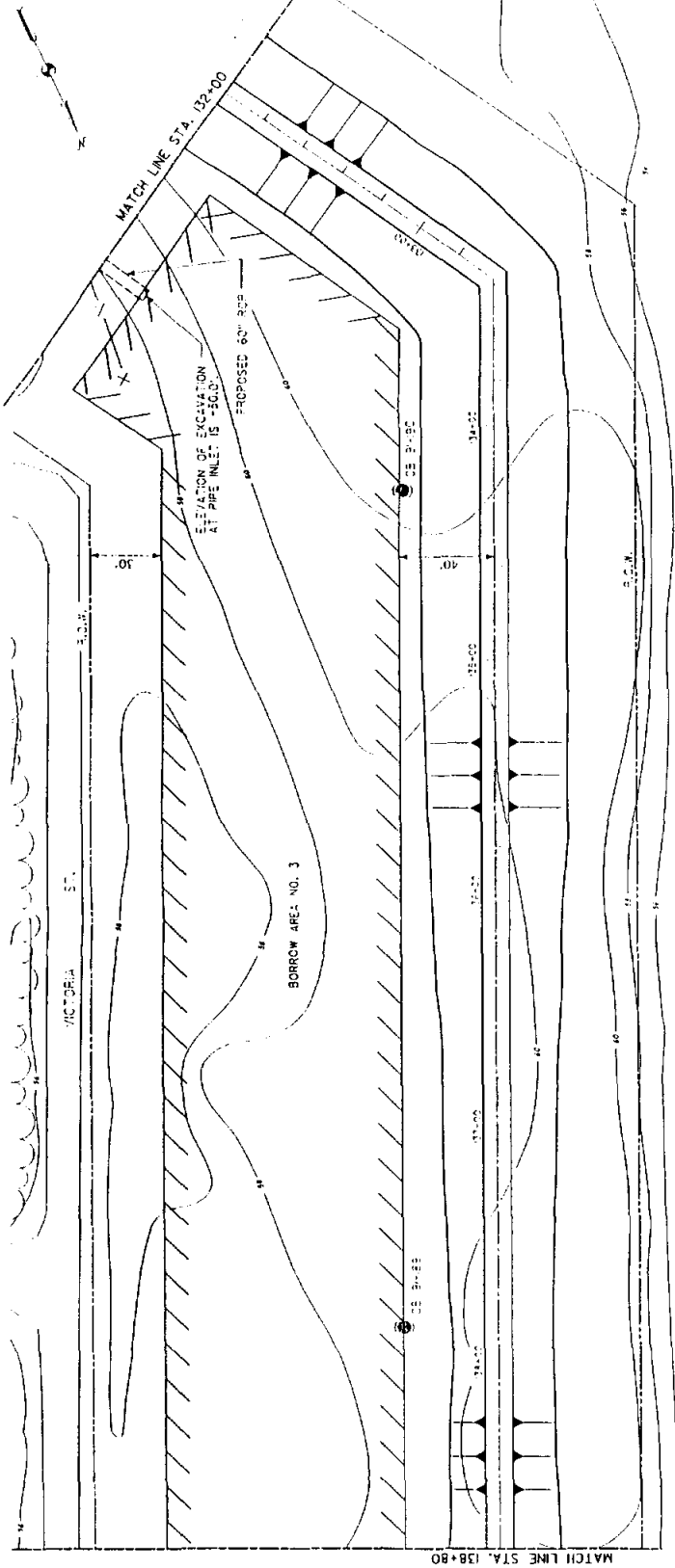
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 DISTRICT HEADQUARTERS
 WASHINGTON, D.C.

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 DRAWING NO. 138-80
 SHEET NO. _____
 DATE: JANUARY 1952

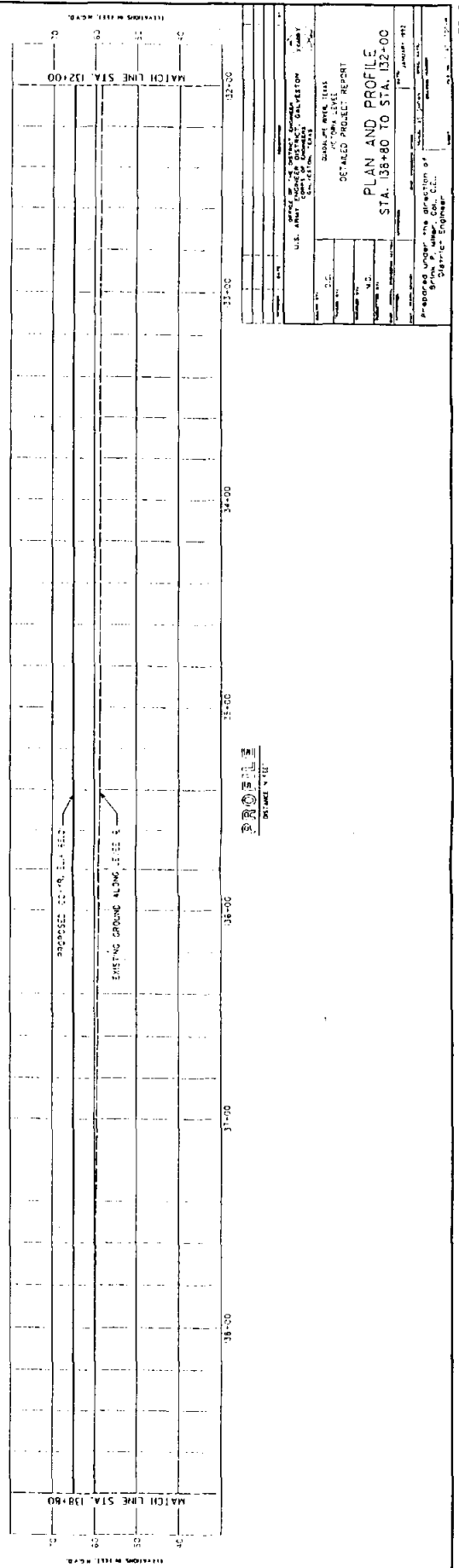
PREPARED UNDER THE DIRECTION OF
 DISTRICT ENGINEER
 DISTRICT ENGINEER

PLAN AND PROFILE

STA. 144+60 TO STA. 138-80
 DETAILED PROJECT REPORT



1" = 40'
 1" = 100'

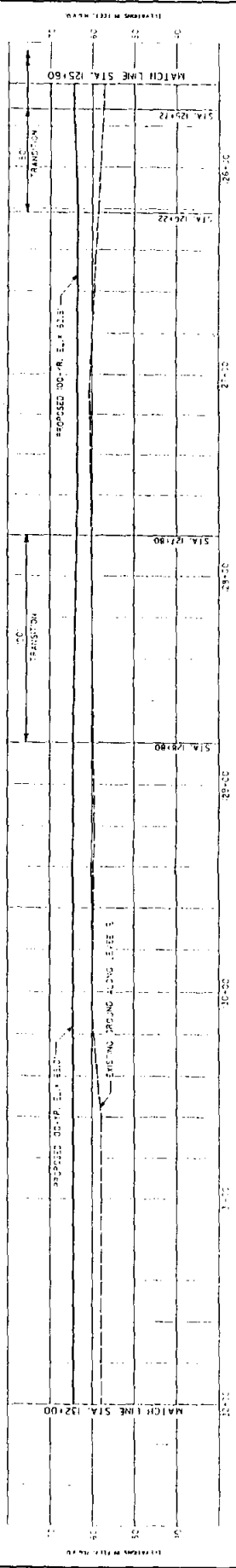
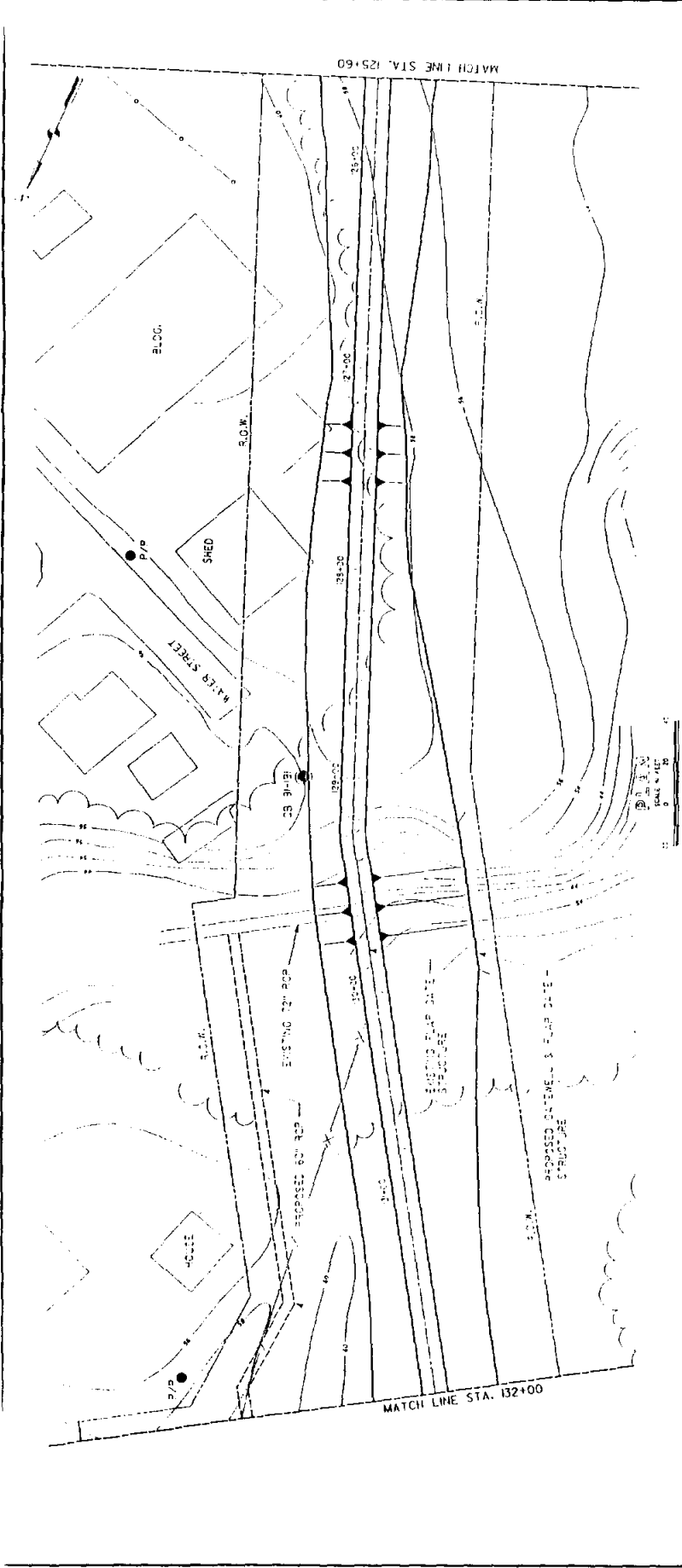


PROFILE
 DISTANCE IN FEET

U.S. ARMY ENGINEER DISTRICT OFFICE
 DISTRICT OFFICE
 DISTRICT ENGINEER

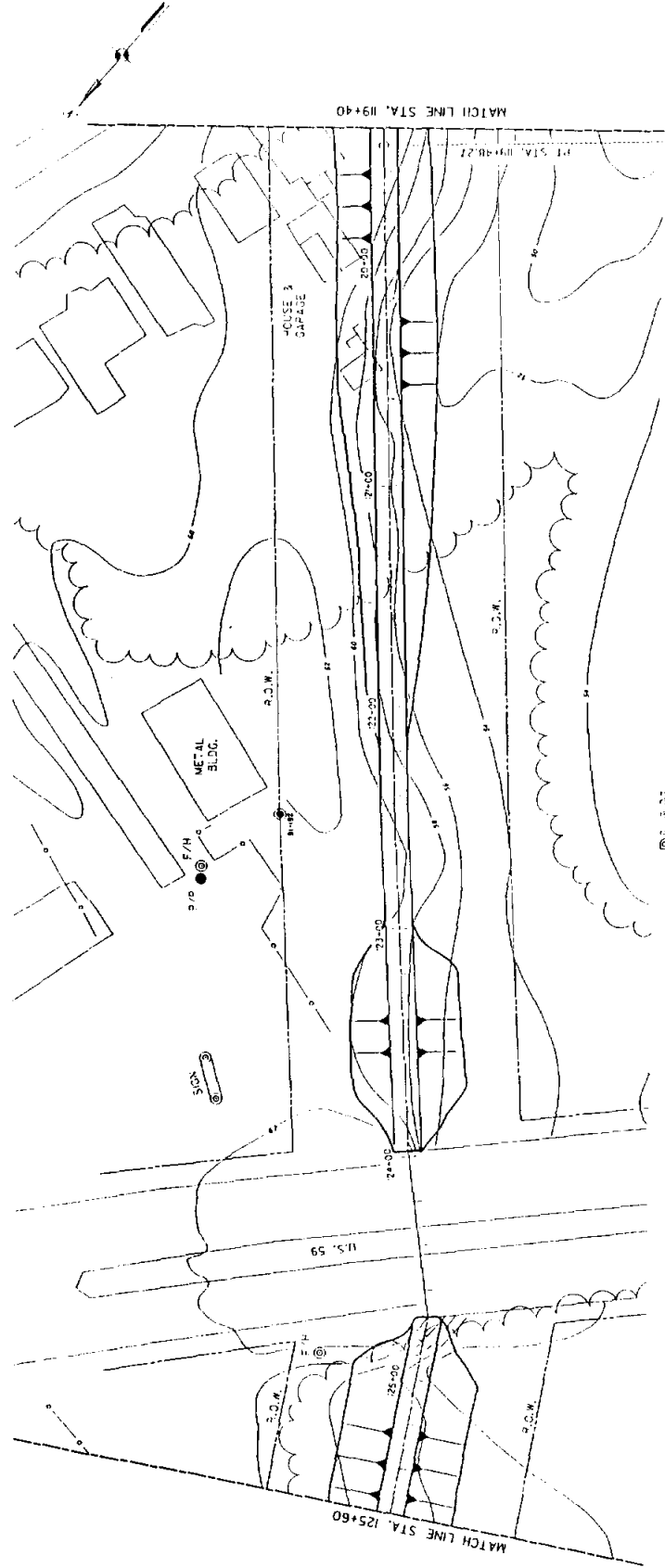
SUBMIT WORK ITEMS
 AT WORK LEVEL
 DETAILED PROJECT REPORT
 PLAN AND PROFILE
 STA. 138+80 TO STA. 132+00

APPROVED: [Signature]
 DISTRICT ENGINEER

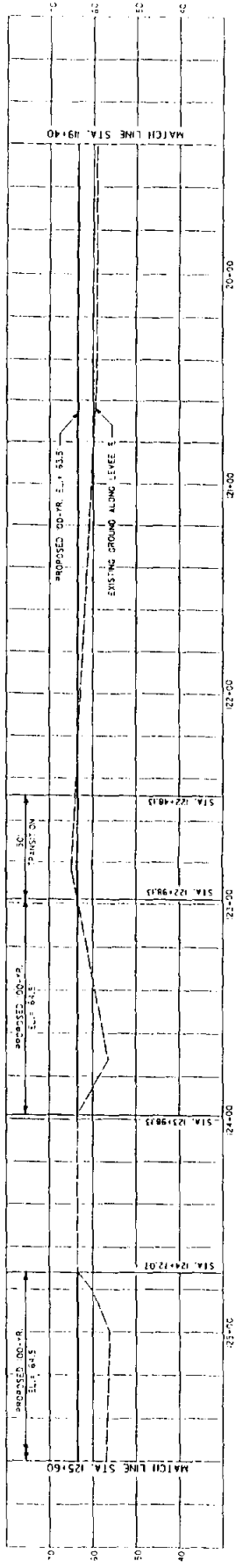


U.S. DEPARTMENT OF TRANSPORTATION
 BUREAU OF PUBLIC ROADS
 DISTRICT ENGINEER
 STATE OF CALIFORNIA
 COUNTY OF SACRAMENTO
 PROJECT NO. 125+60
 PLAN AND PROFILE
 STA. 132+00 TO STA. 125+60
 PREPARED UNDER THE DIRECTION OF
 DISTRICT ENGINEER
 SACRAMENTO, CALIF.

STATION	ELEVATION (FEET)	REMARKS
132+00	18.5	EXISTING GROUND
131+00	18.5	EXISTING GROUND
130+00	18.5	EXISTING GROUND
129+00	18.5	EXISTING GROUND
128+00	18.5	EXISTING GROUND
127+00	18.5	EXISTING GROUND
126+00	18.5	EXISTING GROUND
125+60	18.5	EXISTING GROUND



PLAN
SCALE 1" = 10'



PROFILE
VERTICAL SCALE 1" = 10'

DESIGNED UNDER THE DIRECTION OF
 Major General
 District Engineer

PROJECT REPORT
 DISTRICT ENGINEER
 DISTRICT OFFICE
 DISTRICT ENGINEER

PLAN AND PROFILE
 STA. 125+60 TO STA. 119+40

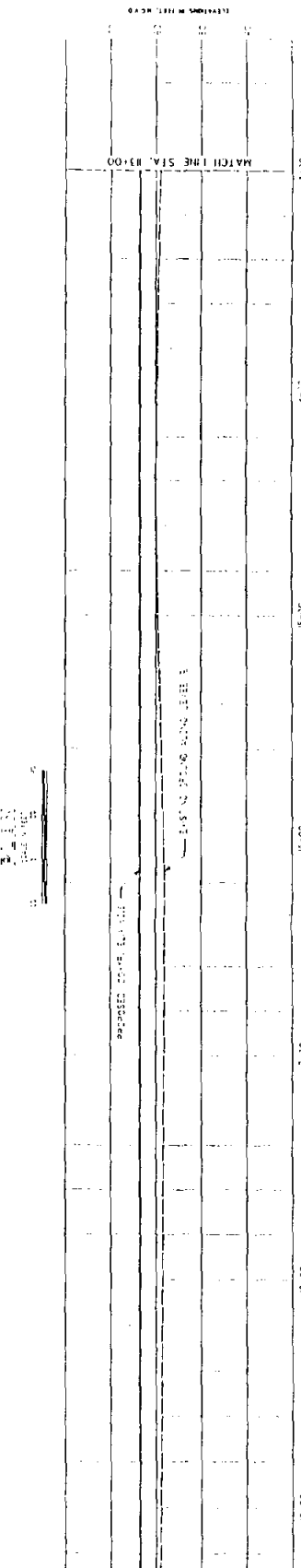
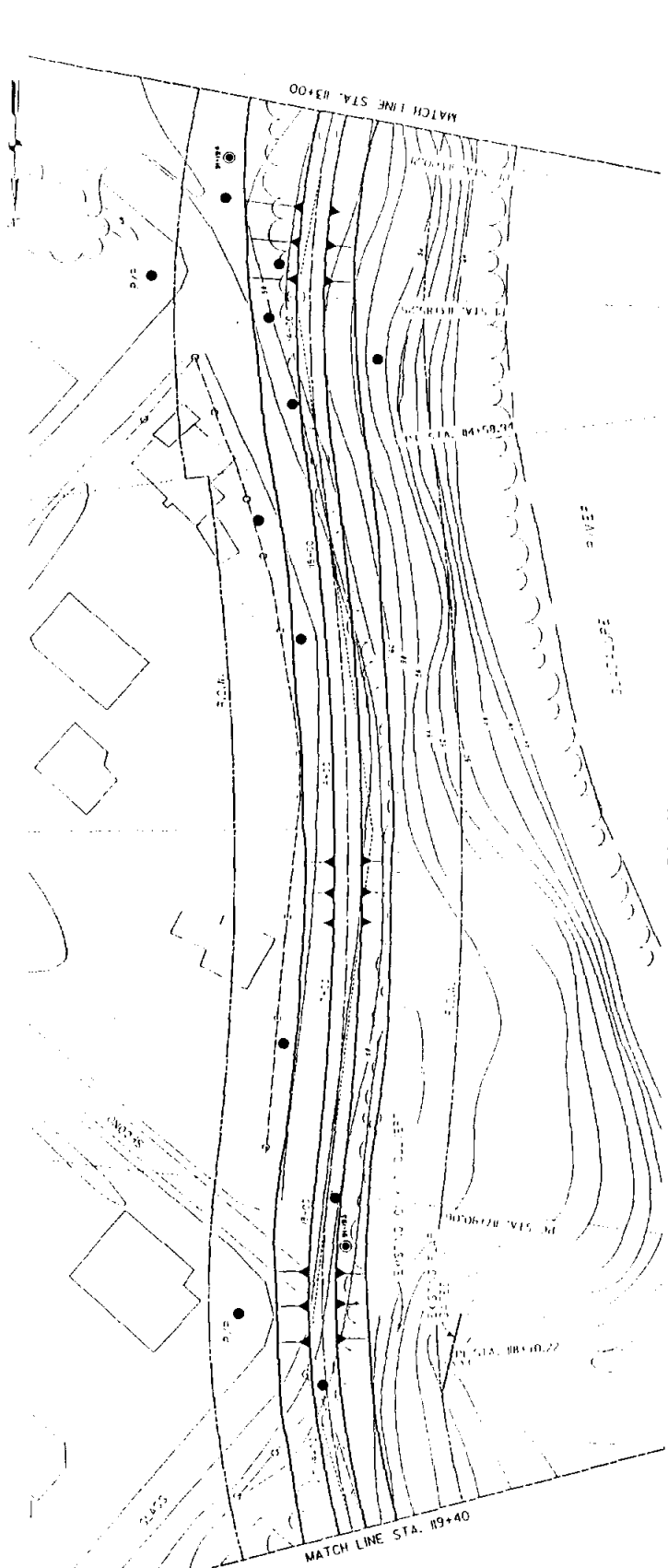
DATE: 1943

BY: [Name]

CHECKED BY: [Name]

APPROVED BY: [Name]

U.S. ARMY ENGINEERING DISTRICT, WASHINGTON



U.S. ARMY DISTRICT OFFICE, WASHINGTON, D.C.
 DISTRICT ENGINEER
 DISTRICT OFFICE, WASHINGTON, D.C.
 DISTRICT ENGINEER

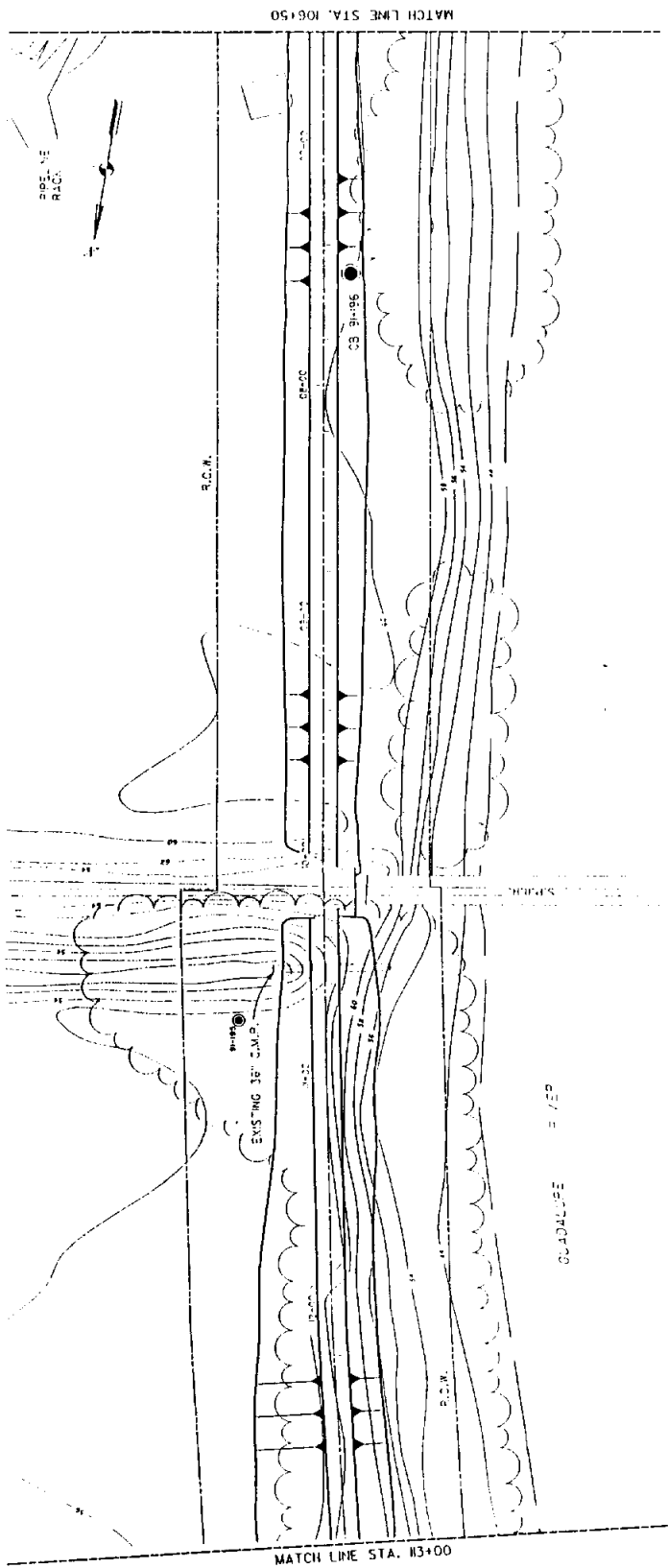
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 SHEET NO. _____
 TOTAL SHEETS _____
 DATE _____

PREPARED UNDER THE DIRECTION OF
 DISTRICT ENGINEER, WASHINGTON, D.C.

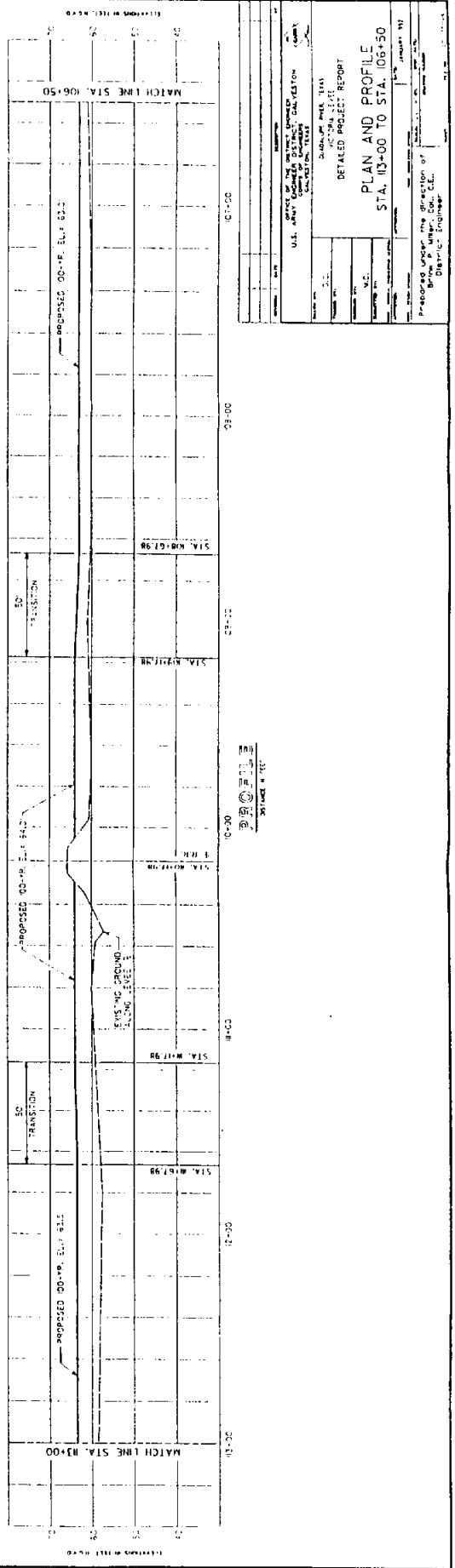
PLAN AND PROFILE
 STA. 119+40 TO STA. 113+00

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119+20	110.50	
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118+80	111.50	
118+60	112.00	
118+40	112.50	
118+20	113.00	
118+00	113.50	
117+80	114.00	
117+60	114.50	
117+40	115.00	
117+20	115.50	
117+00	116.00	
116+80	116.50	
116+60	117.00	
116+40	117.50	
116+20	118.00	
116+00	118.50	
115+80	119.00	
115+60	119.50	
115+40	120.00	

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 CHECKED BY: _____
 DATE: _____



SCALE IN FEET
 1" = 40'



U.S. ARMY CORP. DISTRICT OFFICE
 DALLAS, TEXAS

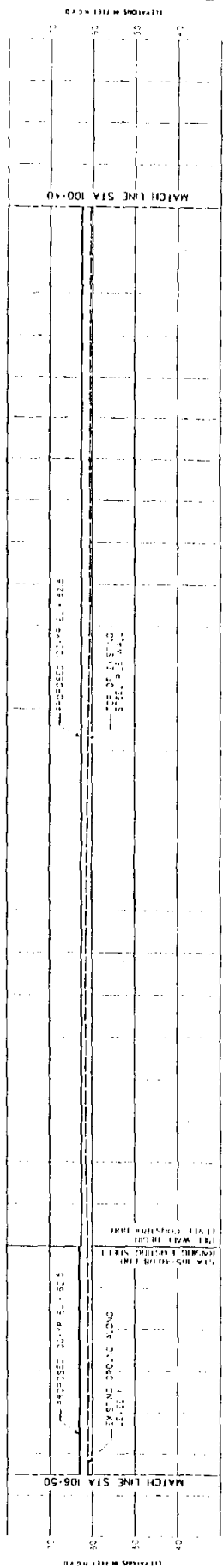
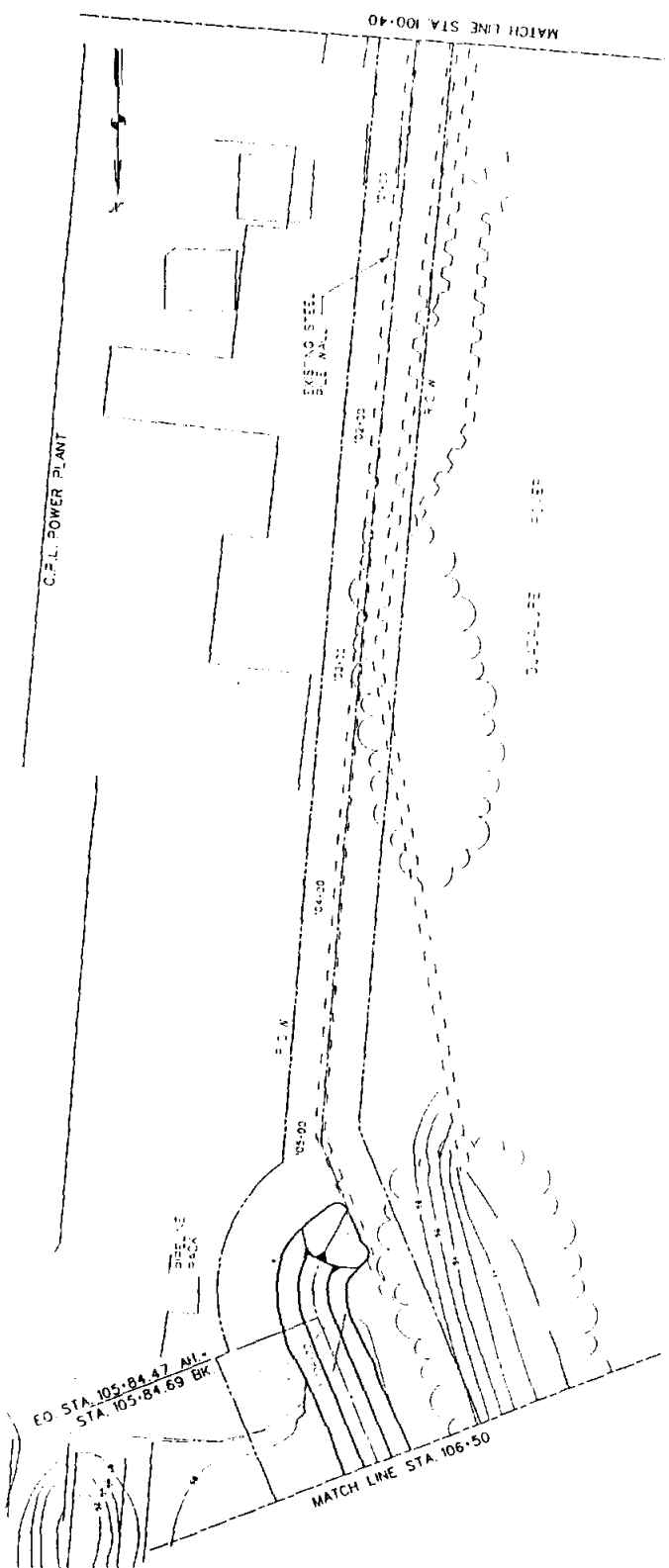
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 DISTRICT NO. 1111

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BY: [Signature]

FOR: [Signature]

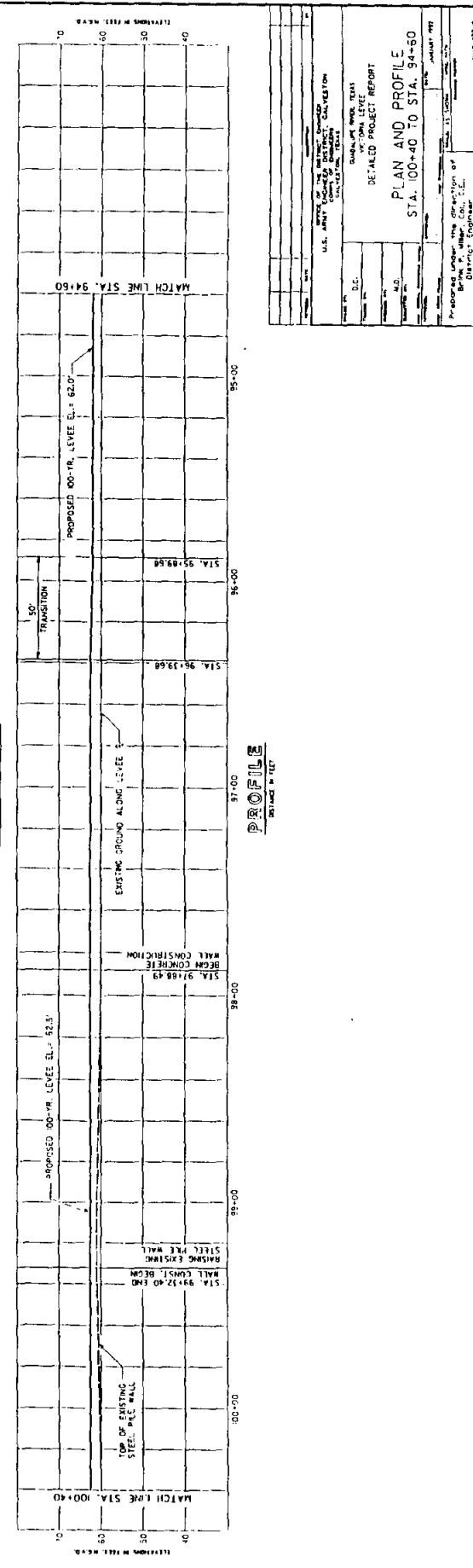
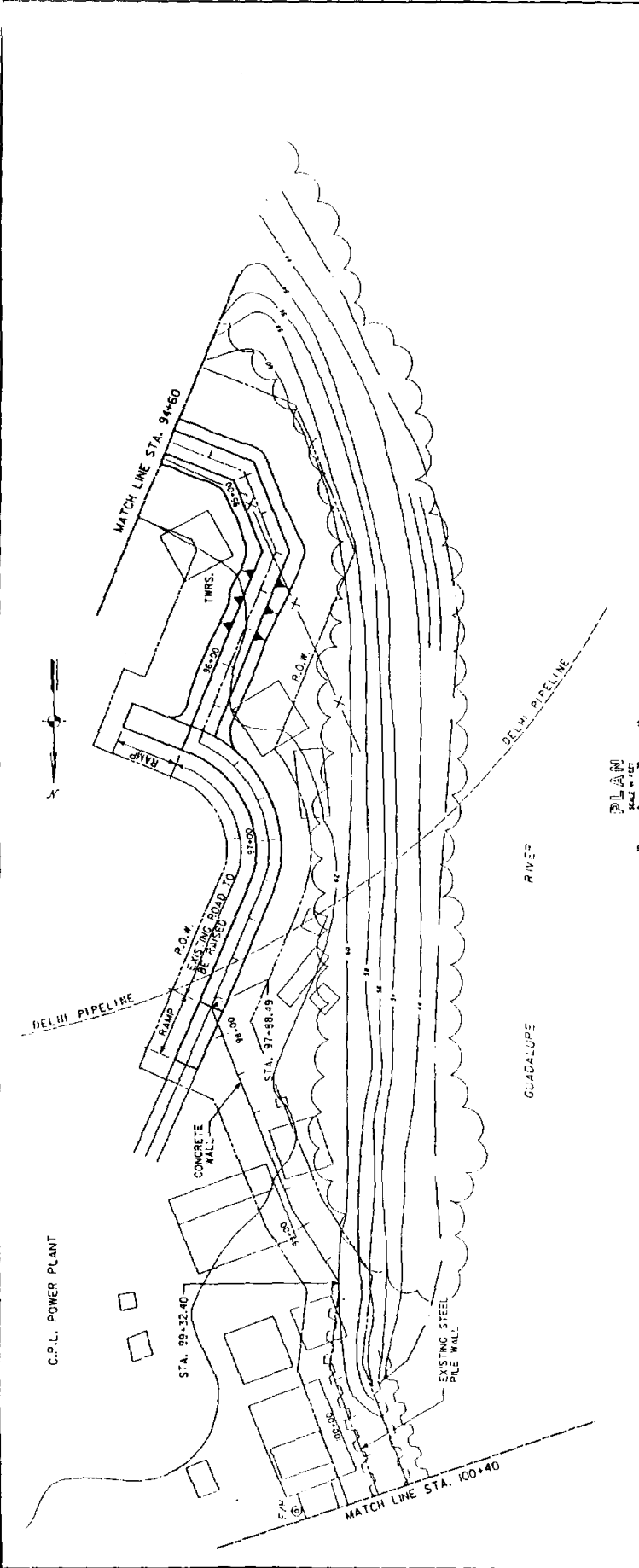
APPROVED UNDER THE DIRECTION OF
 BRUCE A. WELLS, DISTRICT ENGINEER



U.S. ARMY
 ENGINEERING CENTER
 CANALS DIVISION
 SACRAMENTO, CALIF.

PROJECT NO. 145
 DETAIL NO. PROJECT REPORT
 PLAN AND PROFILE
 STA. 100+40 TO STA. 106+50

Prepared under the direction of
 B. P. JAMES, Col., C.E.
 District Engineer

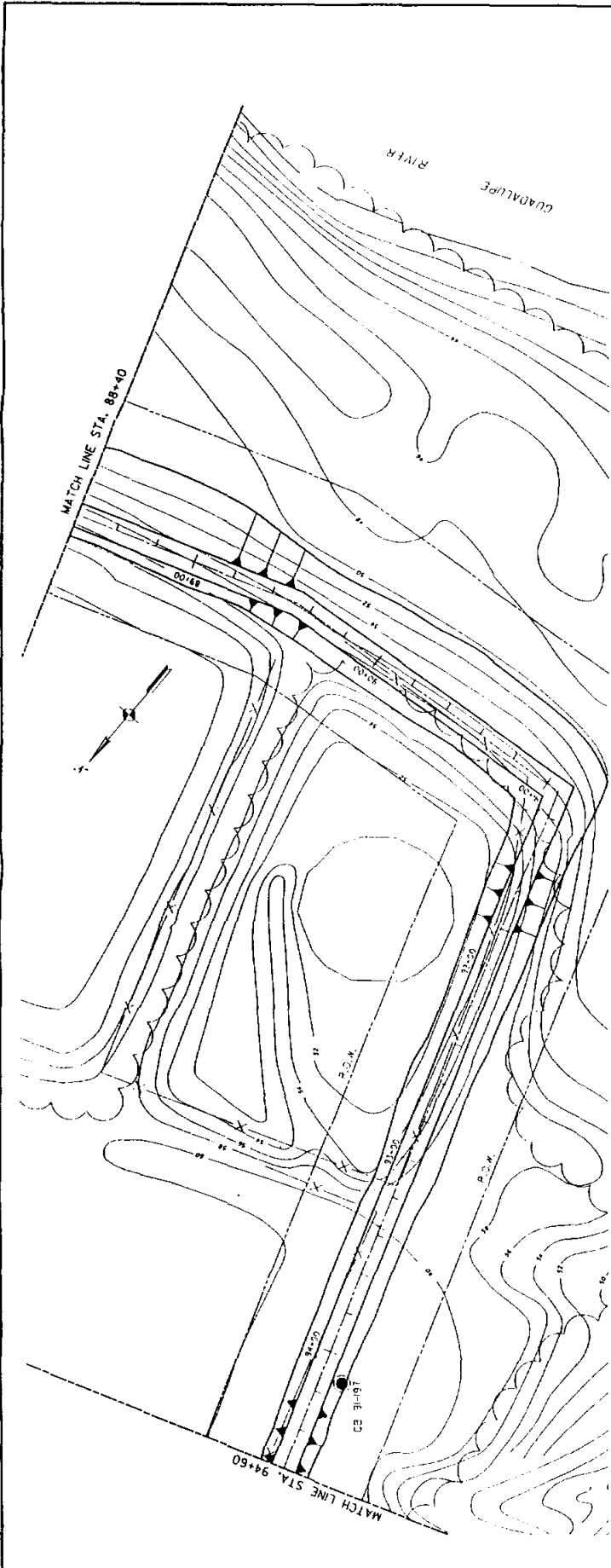


U.S. ARMY DISTRICT ENGINEER
 DISTRICT OFFICE
 DISTRICT ENGINEER

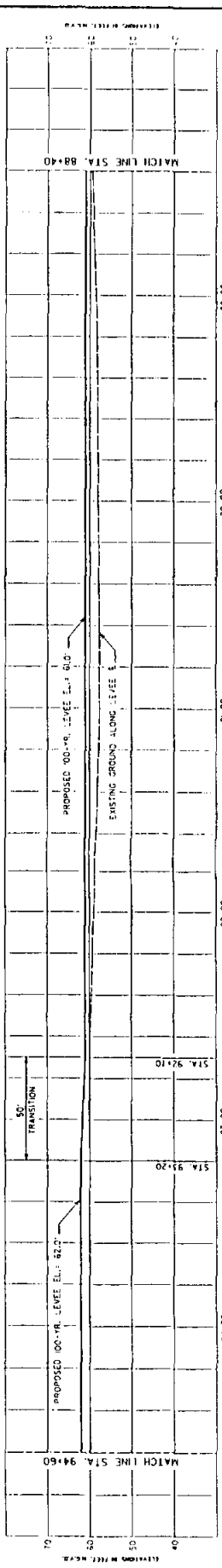
DETAILED PROJECT REPORT
 PLAN AND PROFILE
 STA. 100+40 TO STA. 94+60

DATE: JANUARY 1957

Prepared by: [Name]
 Checked by: [Name]
 District Engineer

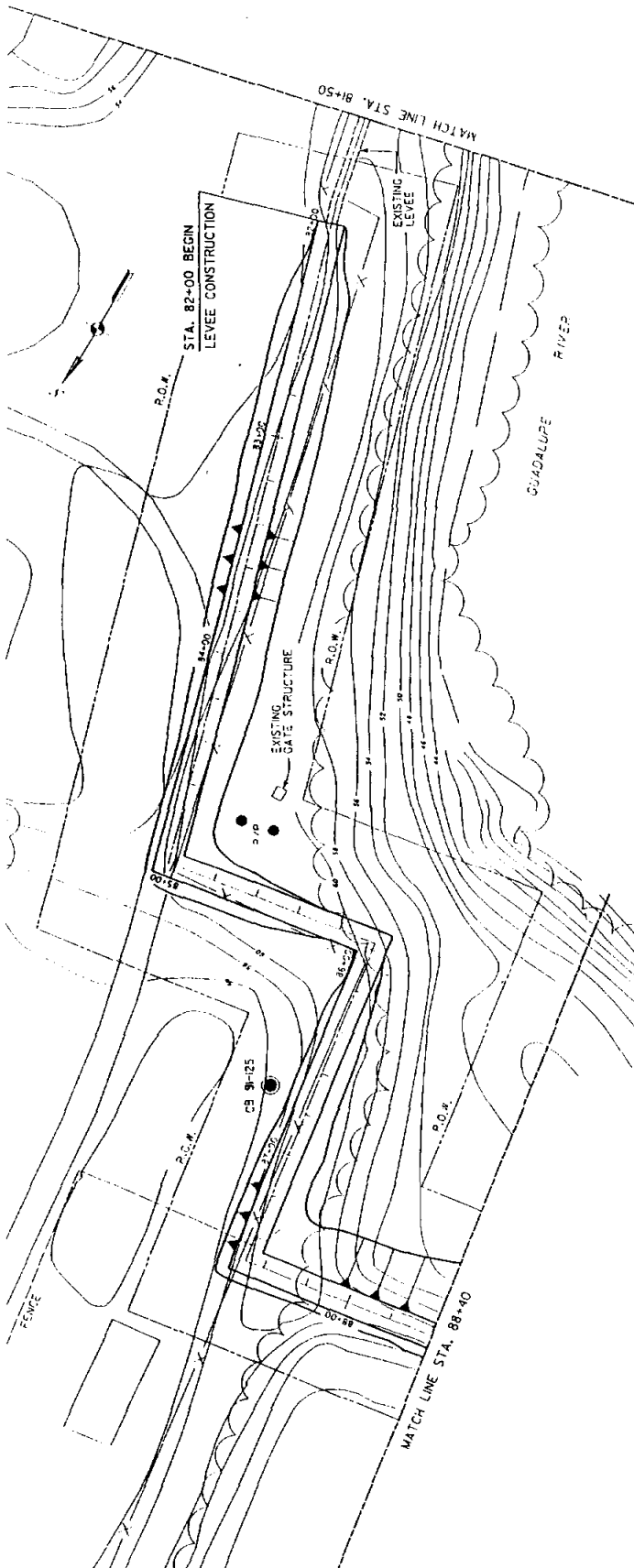


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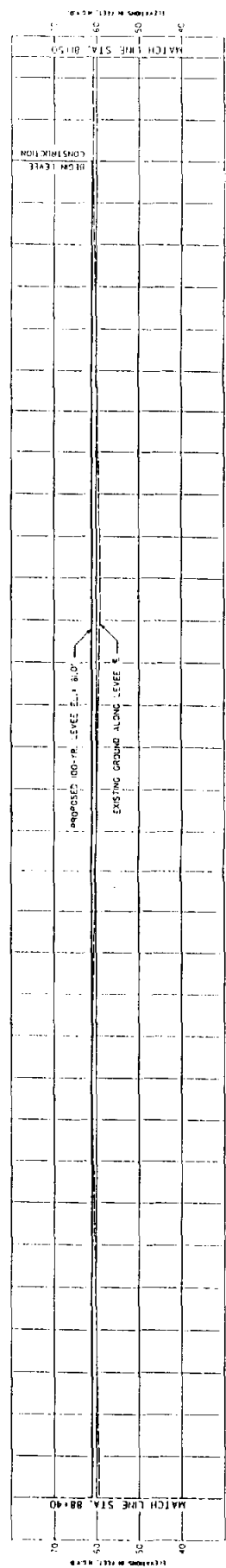


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DESIGNED BY	DATE
CHECKED BY	DATE
APPROVED BY	DATE
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Prepared under the direction of District Engineer	



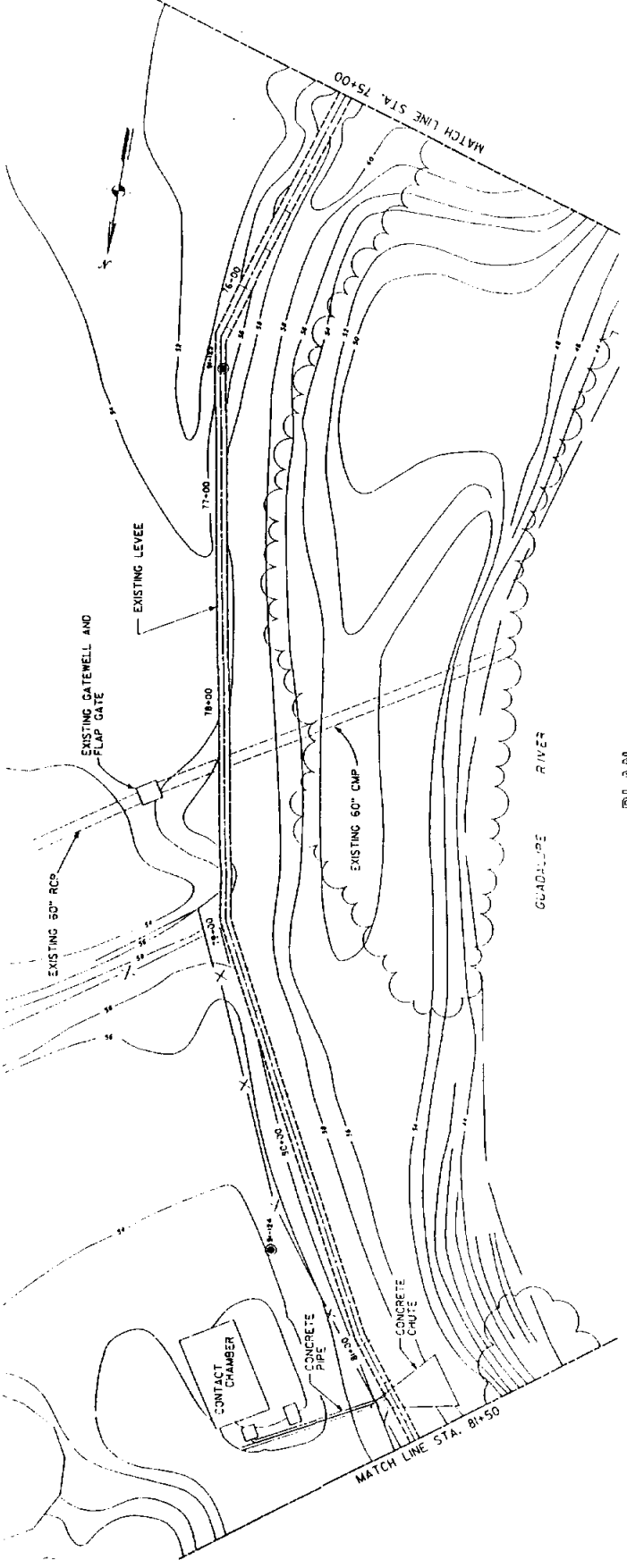
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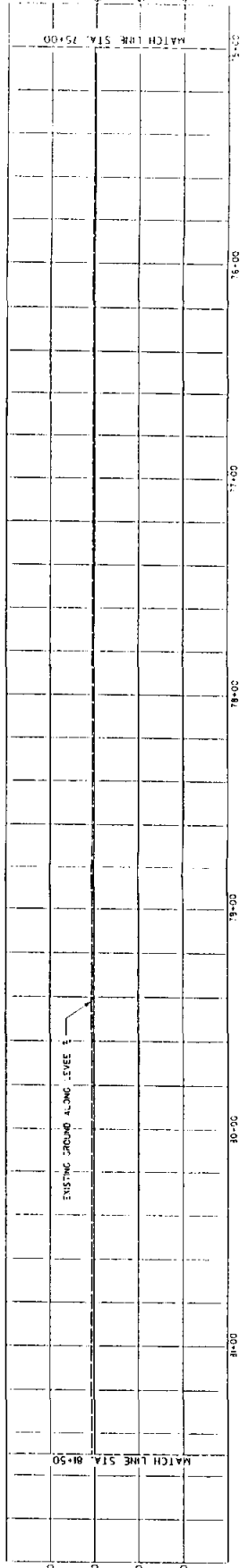
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PROJECT NO.	DATE
DISTRICT	SCALE
D.C.	DESIGNED BY
ENGINEER	CHECKED BY
DATE	APPROVED BY
PREPARED UNDER THE DIRECTION OF BRIG. GEN. J. C. [Name] DISTRICT ENGINEER	
TITLE PLAN AND PROFILE STA. 88+40 TO STA. 81+50	

DATE



PLAN
SCALE 1" = 100'



PROFILE
SCALE 1" = 100'

U.S. ARMY OF ENGINEERS
CORPS OF ENGINEERS
WASHINGTON, D.C.

DESIGNED BY
CHECKED BY
APPROVED BY

DATE

PROJECT NO.

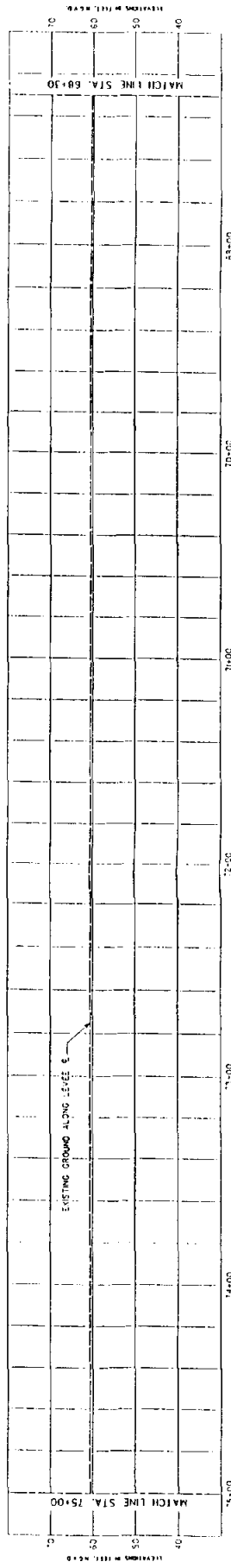
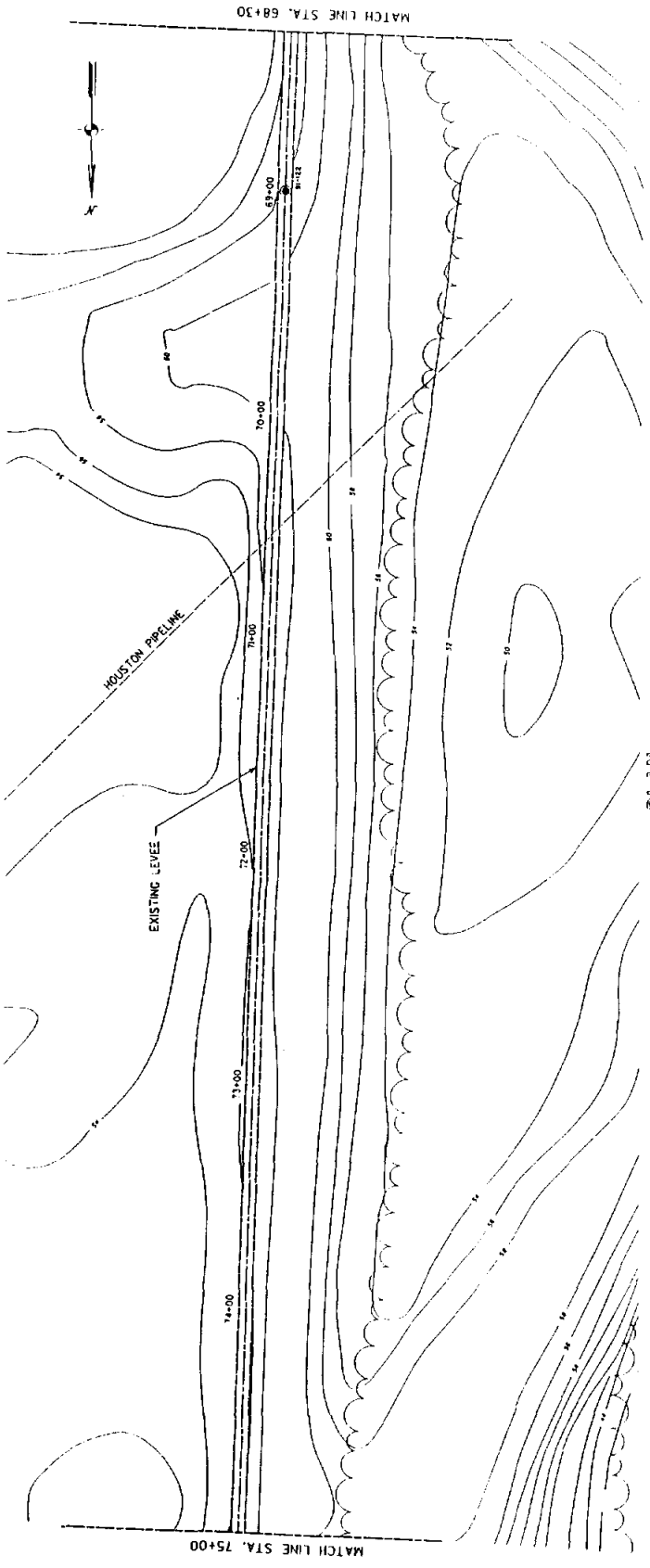
SECTION NO.

DATE

PROJECT TITLE

PLAN AND PROFILE
STA. 81+50 TO STA. 75+00

Prepared under the direction of
District Engineer



U.S. OFFICE OF THE DISTRICT ENGINEER
DISTRICT OF COLUMBIA
DIVISION OF HIGHWAYS
WASHINGTON, D.C.

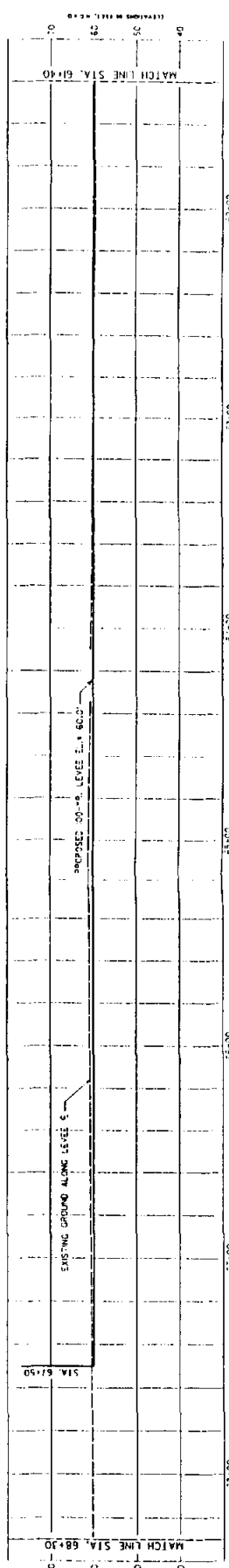
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PROJECT NO. 1234

SECTION NO. 1

PLAN AND PROFILE
STA. 75+00 TO STA. 68+30

Prepared under the direction of
District Engineer, C. C. ...



PROFILE
SCALE 1" = 10'

U.S. ARMY CORPS OF ENGINEERS
DISTRICT OFFICE
STATION

DATE: 11/15/50
BY: J. W. [unreadable]

PROJECT: [unreadable]

DESIGNED BY: [unreadable]

CHECKED BY: [unreadable]

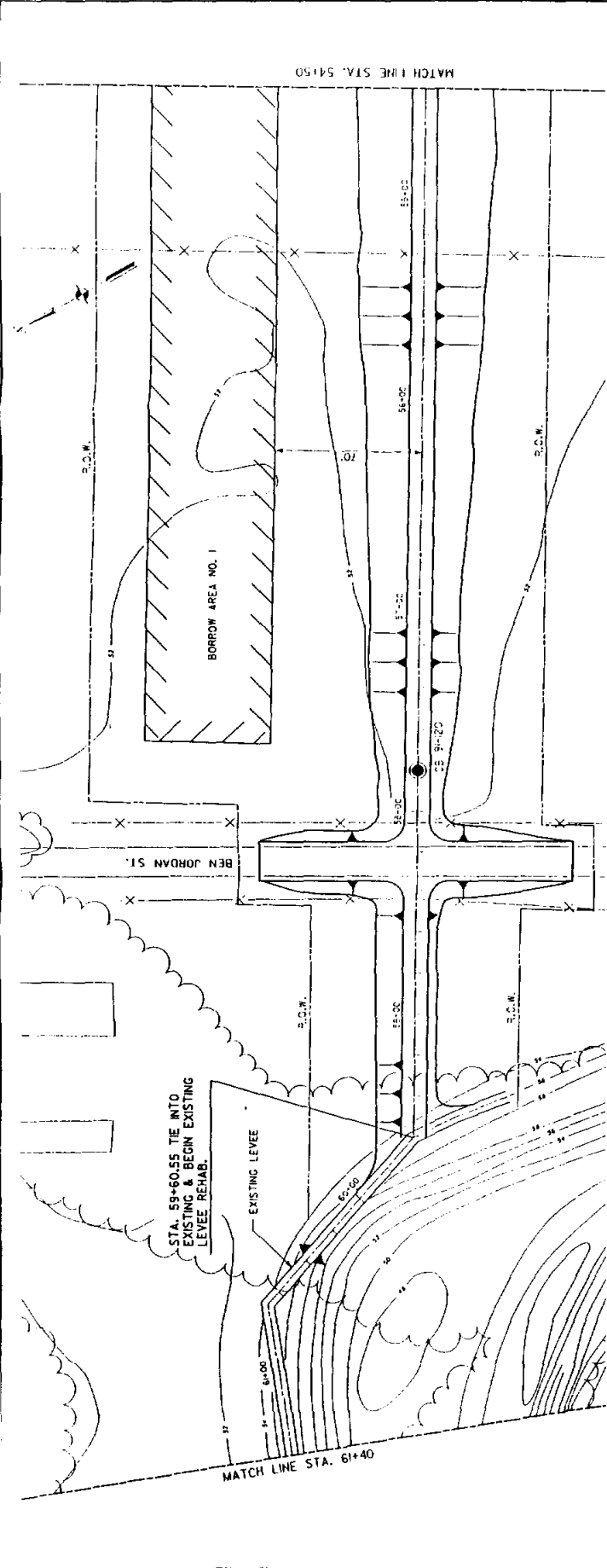
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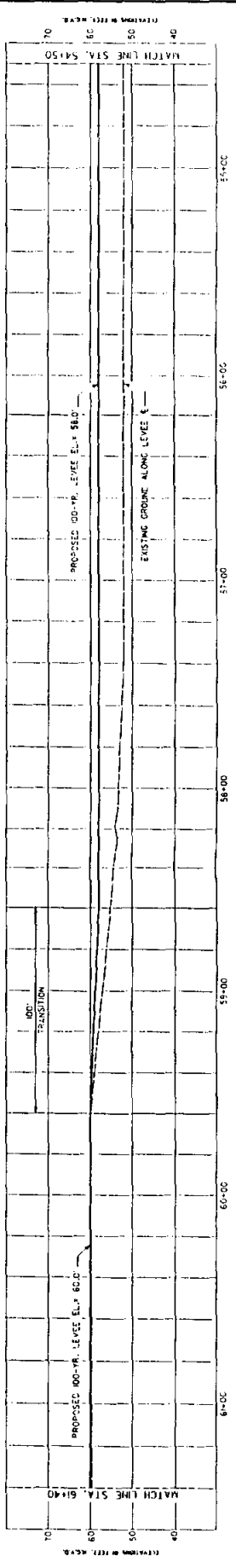
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ENGINEER: [unreadable]

DISTRICT ENGINEER: [unreadable]



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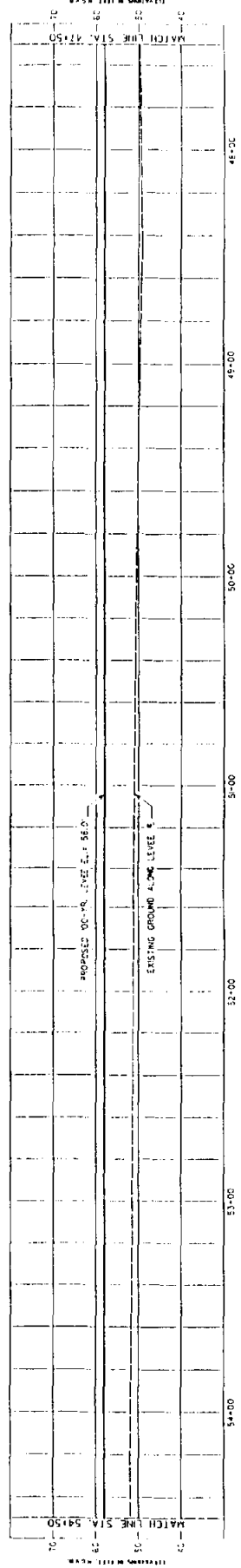
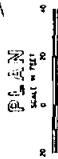
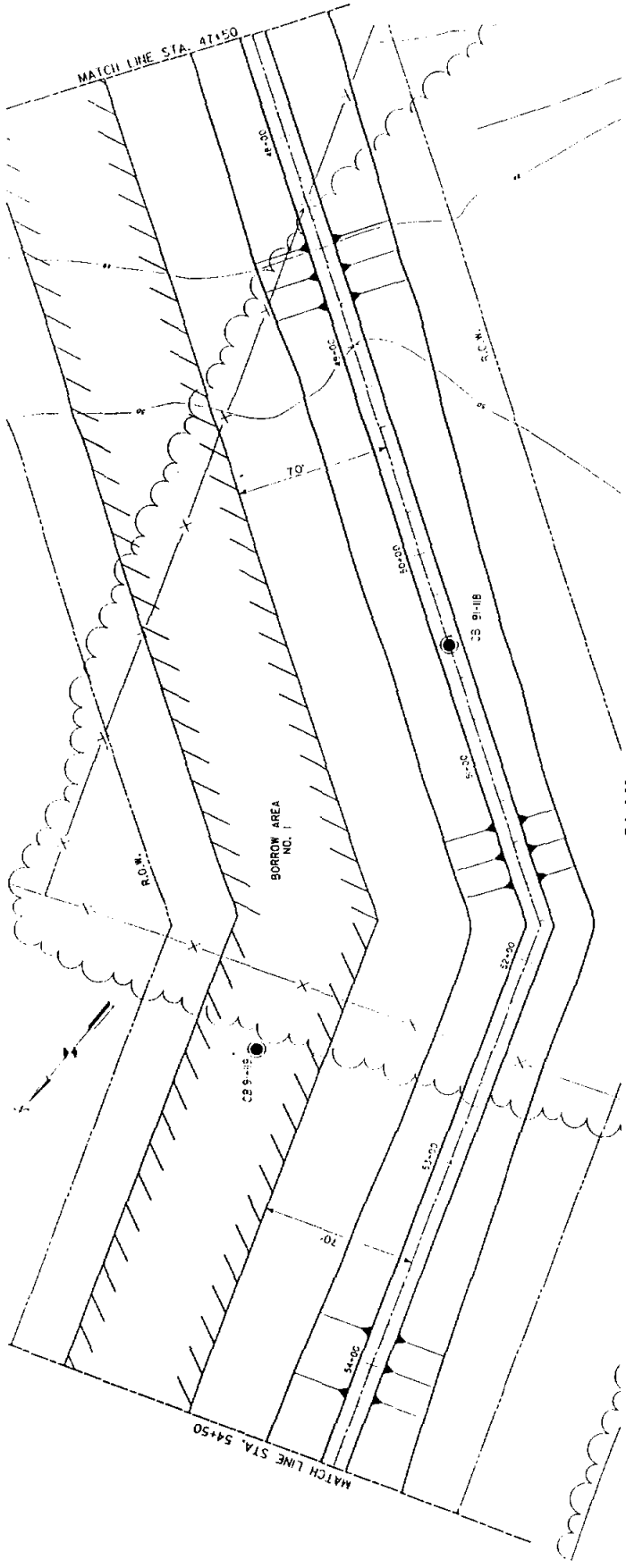


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CONTRACT VALUE	CONTRACT VALUE
CONTRACT DATE	CONTRACT DATE
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CONTRACT TYPE	CONTRACT TYPE
CONTRACT STATUS	CONTRACT STATUS
CONTRACT OWNER	CONTRACT OWNER
CONTRACT ENGINEER	CONTRACT ENGINEER
CONTRACT ARCHITECT	CONTRACT ARCHITECT
CONTRACT CONTRACTOR	CONTRACT CONTRACTOR
CONTRACT SUBCONTRACTOR	CONTRACT SUBCONTRACTOR
CONTRACT SURETY	CONTRACT SURETY
CONTRACT BOND	CONTRACT BOND
CONTRACT INSURANCE	CONTRACT INSURANCE
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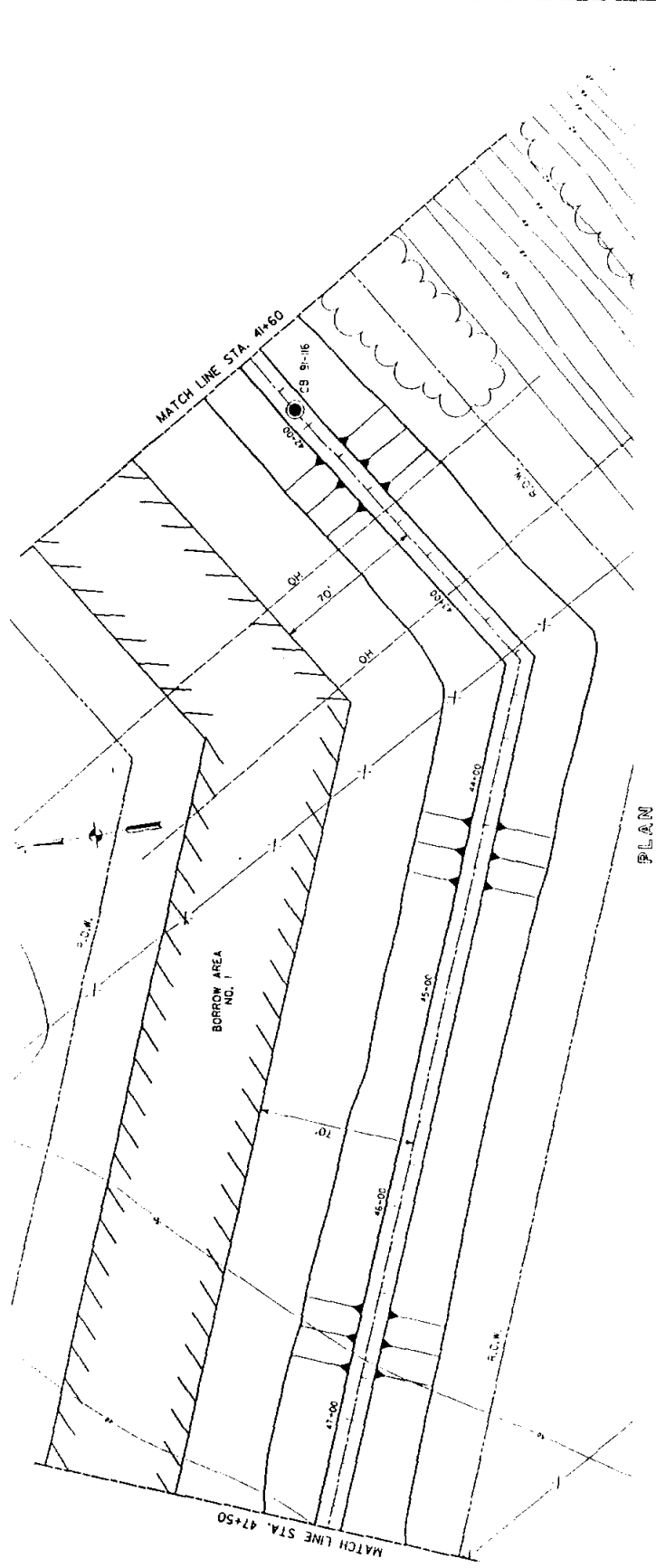
PLAN AND PROFILE
STA. 61+40 TO STA. 54+50

U.S. BUREAU OF RECONSTRUCTION
DISTRICT OFFICE
NEW YORK, N.Y.
DISTRICT ENGINEER
[Signature]

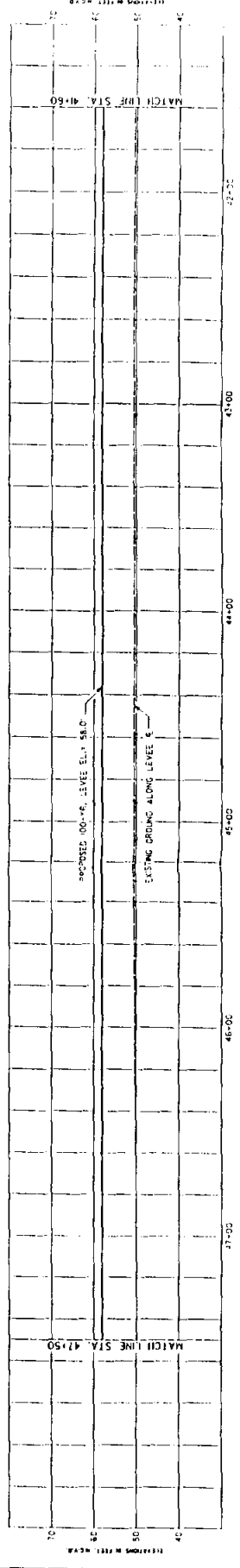


PROFILE
DISTANCE IN FEET

OFFICE OF THE DISTRICT ENGINEER U.S. ARMY CORPS OF ENGINEERS WASHINGTON, D.C.	
PROJECT NO.	DATE
DESIGNED BY	CHECKED BY
DRAWN BY	APPROVED BY
DISTRICT PROJECT REPORT PLAN AND PROFILE STA. 54+50 TO STA. 47+50	
Prepared under the direction of District Engineer, U.S. Army Corps of Engineers	

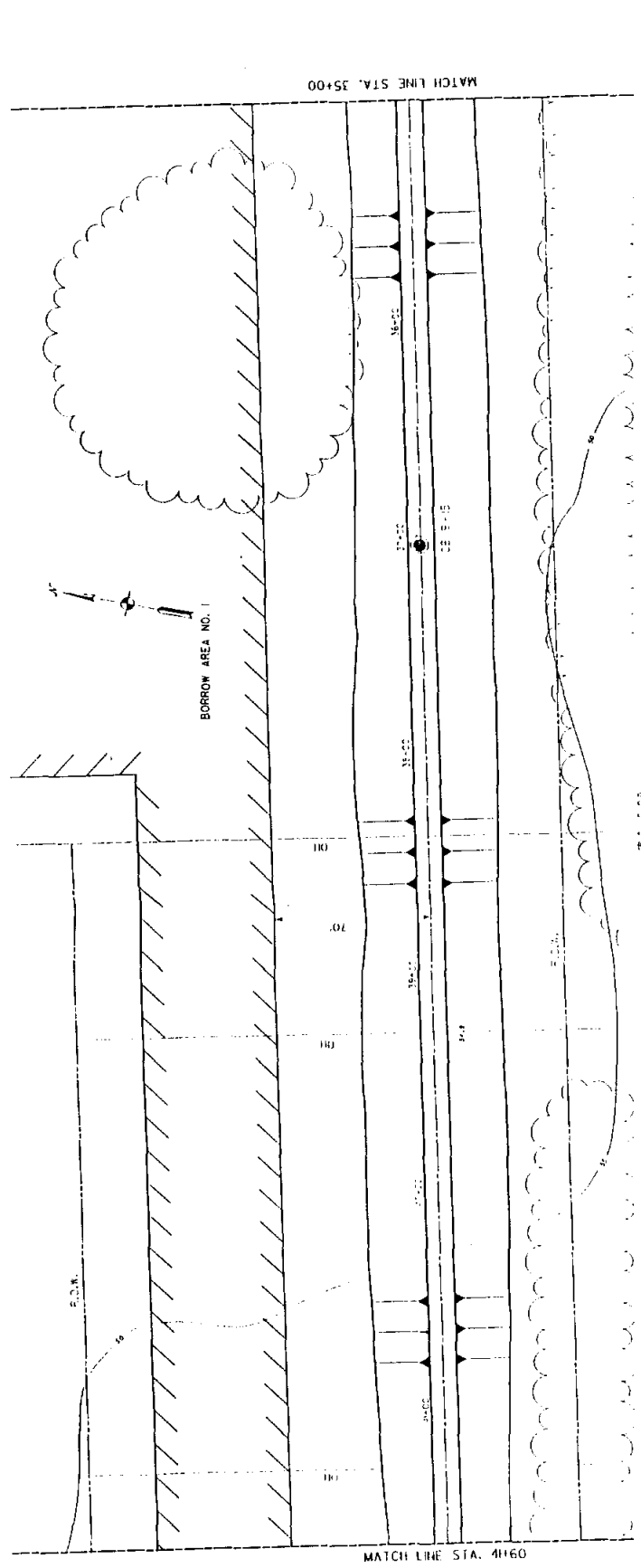


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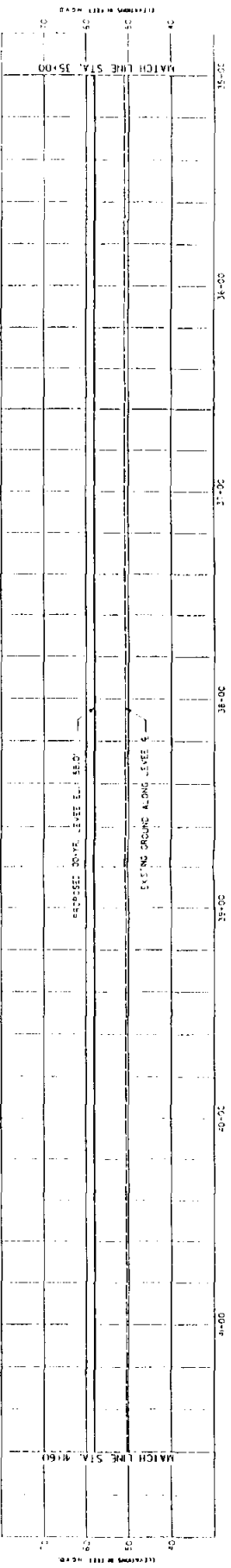


PROFILE
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U.S. ARMY ENGINEER DISTRICT OFFICE CORPUS CHRISTI, TEXAS	
Project Name	STATION LEVEE
Location	QUADRAWS BRIDGE
Scale	AS SHOWN
Date	JANUARY 1957
PLAN AND PROFILE	
STA. 47+50 TO STA. 48+50	
Prepared by	W. L. [Name]
Checked by	[Name]
Approved by	[Name]
District Engineer	



SCALE 1" = 40'



PROFILE
SCALE 1" = 10'

U.S. ARMY ENGINEERING DISTRICT, WASHINGTON

DETAILS PROJECT REPORT

PLAN AND PROFILE
STA. 41+60 TO STA. 35+00

PROJECT NO. 1-2

SECTION NO. 42

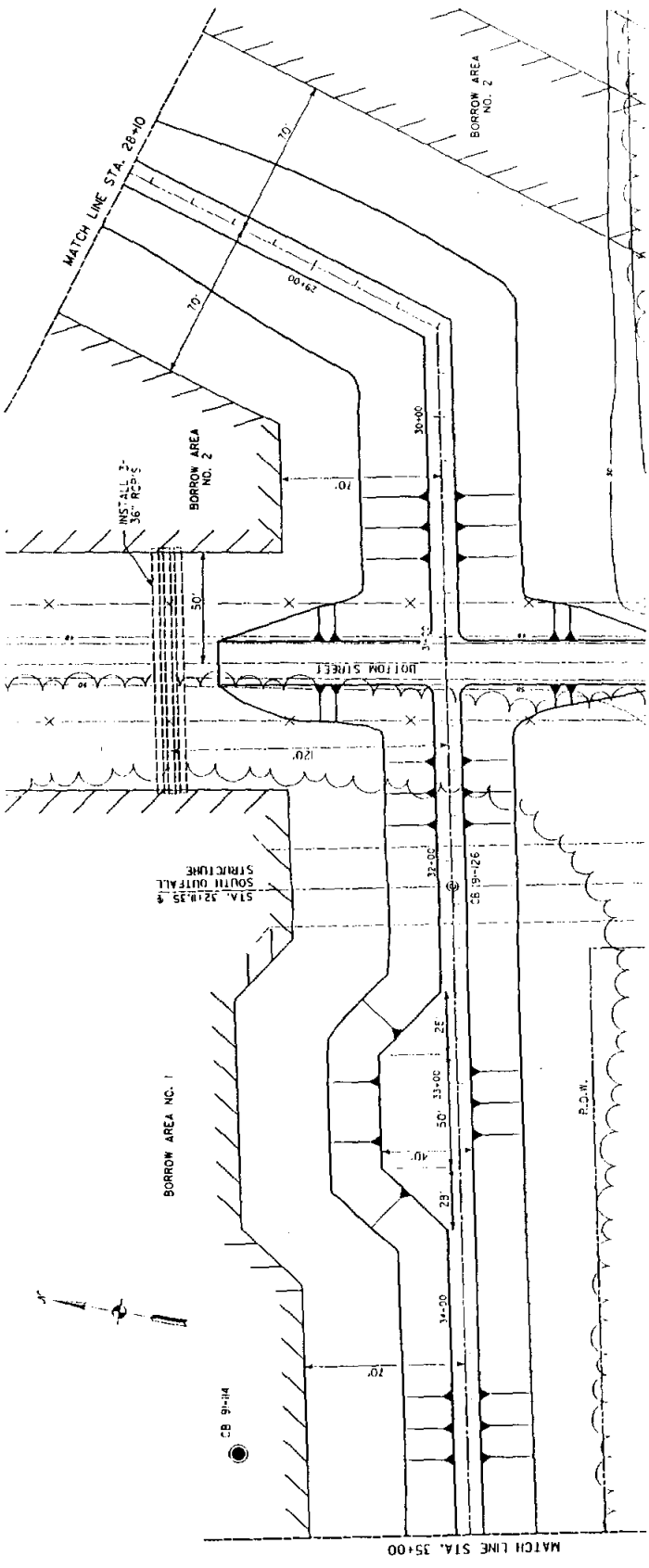
DATE: 1/15/51

DESIGNED BY: [Name]

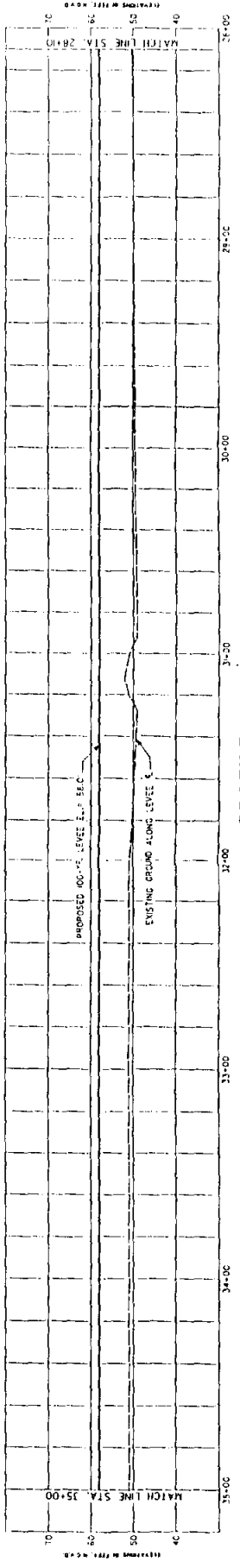
CHECKED BY: [Name]

APPROVED BY: [Name]

DISTRICT ENGINEER

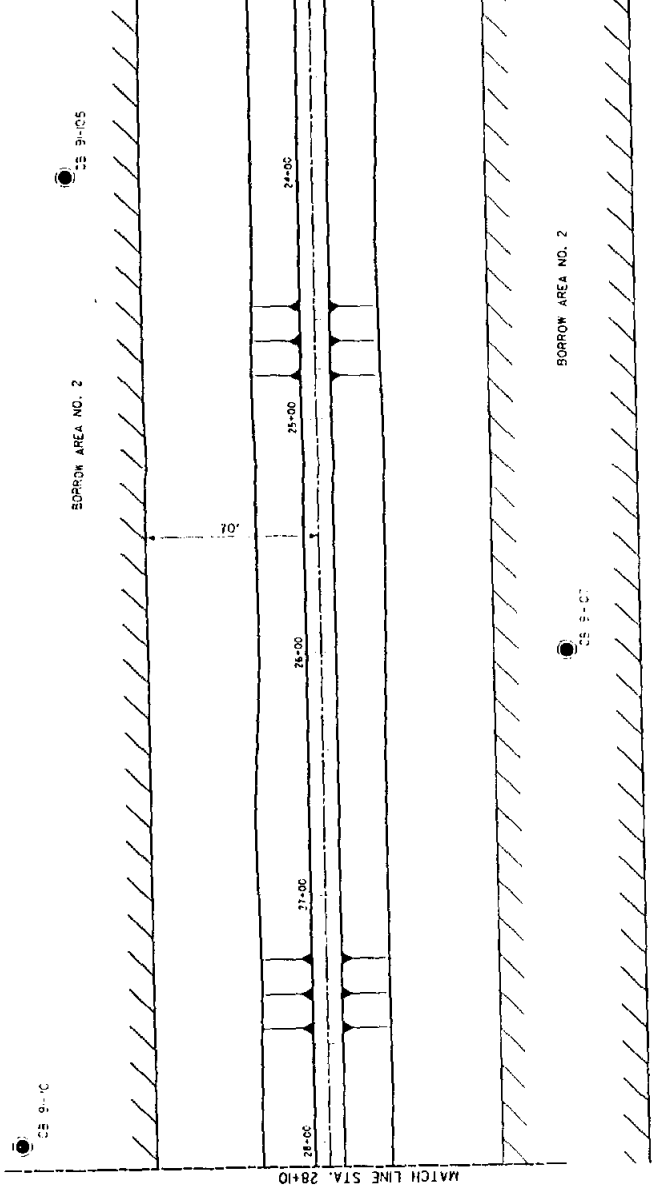


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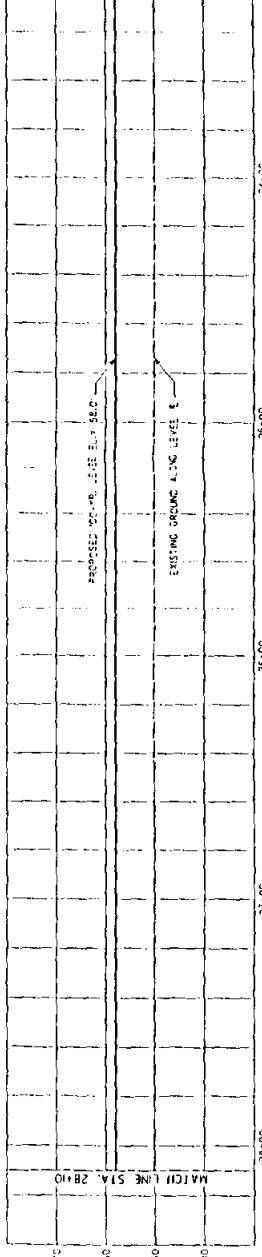


PROFILE
DISTANCE IN FEET

U.S. ARMY CORPS OF ENGINEERS
 DISTRICT OFFICE
 GALVESTON, TEXAS
 DISTRICT ENGINEER
 PROJECT NO. 100-1000
 CONTRACT NO. 100-1000
 DRAWING NO. 100-1000
 SHEET NO. 100-1000
 DATE: JANUARY 1911
 Prepared under the direction of
 Major W. W. ...
 District Engineer



PLAN

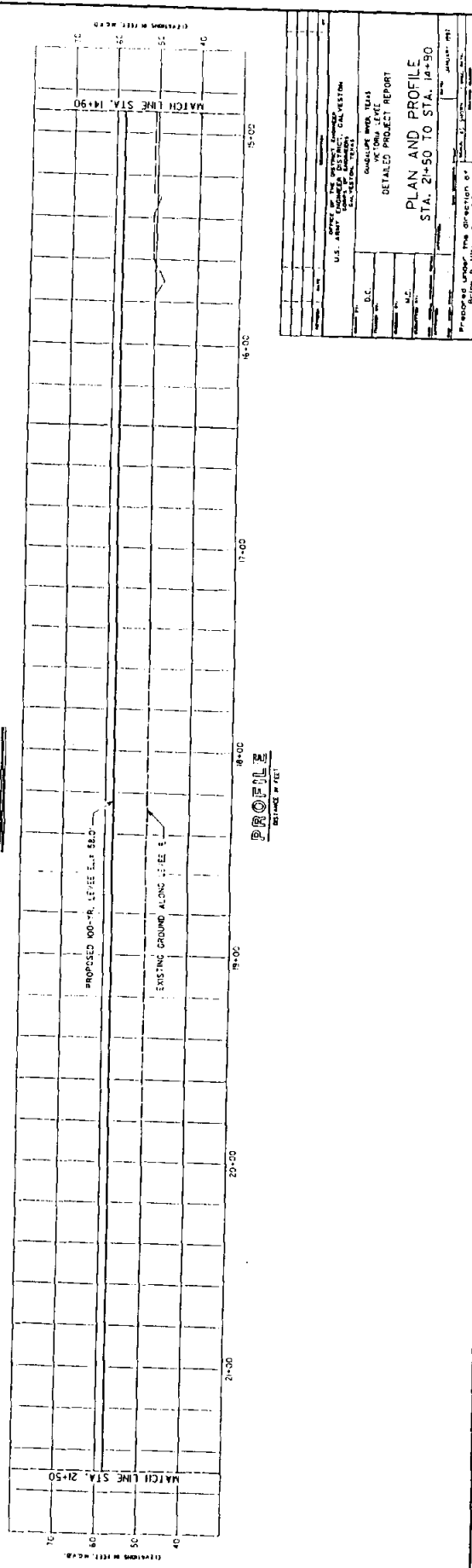
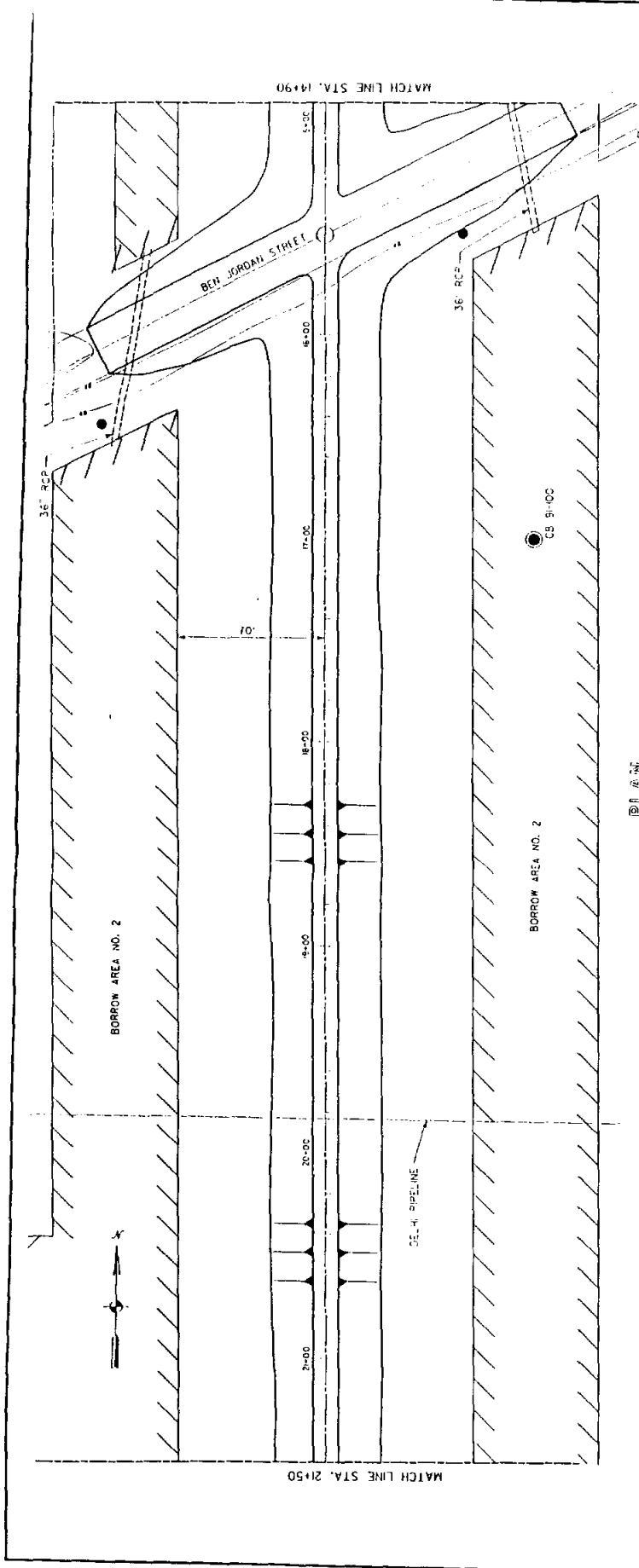


PROFILE

U.S. ARMY ENGINEER DISTRICT, GALVESTON
 DISTRICT OFFICE
 DISTRICT ENGINEER

PROJECT NO. 3-2
 TITLE: BORROW AREA NO. 2
 PLAN AND PROFILE
 STA. 28+10 TO STA. 24+50

Prepared under the direction of
 District Engineer
 District Office



U.S. ARMY CORPS OF ENGINEERS
 DISTRICT OFFICE
 WASHINGTON, D.C.

CONTRACT NO. 14-50
 VICTORIA LEVEE
 DETAILED PROJECT REPORT
PLAN AND PROFILE
 STA. 2+50 TO STA. 14+90

Prepared under the direction of
 District Engineer

MATCH LINE STA. 8+30

MATCH LINE STA. 14+90

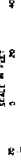
R.C.M.

R.C.M.

BORROW AREA NO. 2

BORROW AREA NO. 2

PLAN
SCALE IN FEET



STATIONS IN FEET, NORTH

MATCH LINE STA. 8+30

MATCH LINE STA. 14+90

STATIONS IN FEET, NORTH

PROPOSED 60' FR. LEVEE E.L.T. 58.0'

EXISTING GROUND ALONG LEVEE

PROFILE
DISTANCE IN FEET

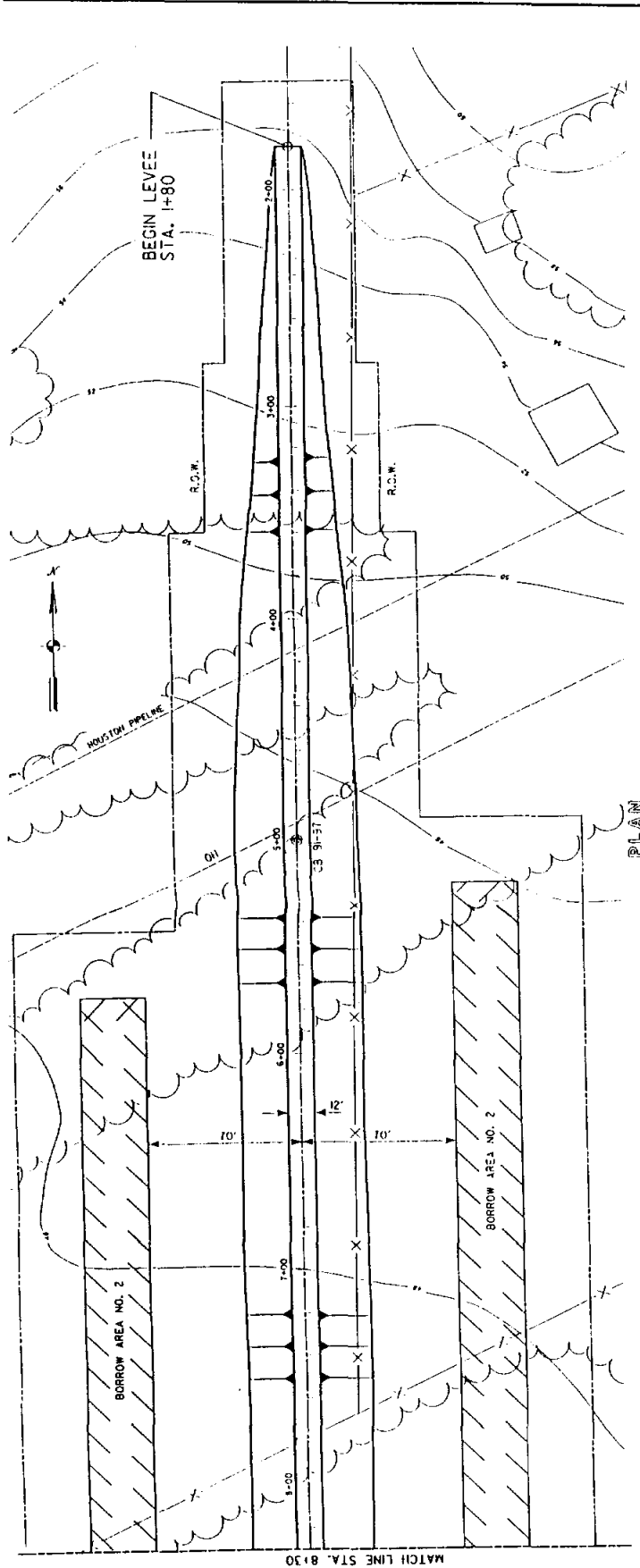


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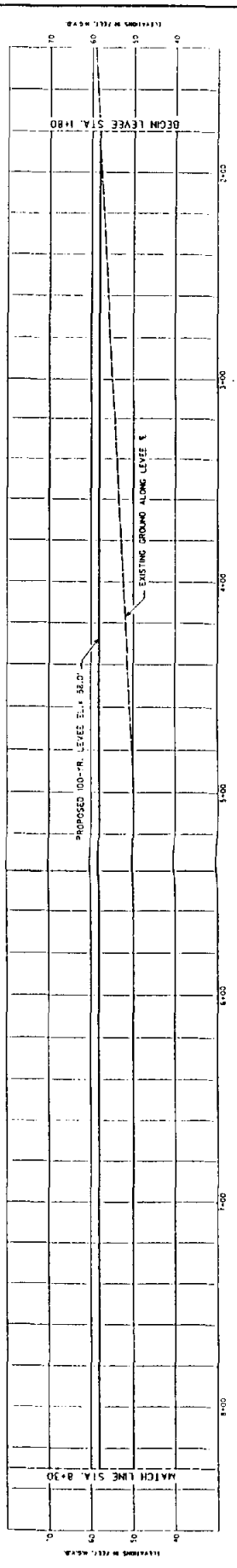
OFFICE OF THE DISTRICT ENGINEER
U.S. ARMY CORPS OF ENGINEERS
WASHINGTON, D.C.

CONTRACT NO. 1-141
SECTION NO. 141
DETAILS PROJECT REPORT
PLAN AND PROFILE
STA. 14+90 TO STA. 8+30

Prepared under the direction of
District Engineer
Washington, D.C., U.S.A.



PLAN
SCALE = 1" = 20'



PROFILE
VERTICAL = 1" = 10'

U.S. DEPARTMENT OF TRANSPORTATION BUREAU OF PUBLIC ROADS	
DISTRICT OF COLUMBIA	
DIVISION OF HIGHWAYS	
PROJECT NO. _____	
SECTION NO. _____	
DATE _____	
DRAWN BY _____	
CHECKED BY _____	
APPROVED BY _____	
TITLE PLAN AND PROFILE STA. 8+30 TO STA. 1+80	
PROJECT UNDER THE DIRECTION OF _____ DISTRICT ENGINEER	

31 2 17 76

FINAL
ENVIRONMENTAL ASSESSMENT

GUADALUPE RIVER at VICTORIA, TEXAS

Section 205 - Small Flood Project

U.S. ARMY ENGINEER DISTRICT

GALVESTON, TEXAS

September 1995

ENVIRONMENTAL ASSESSMENT

GUADALUPE RIVER at VICTORIA, TEXAS

Section 205 - Small Flood Control Project

<u>Section</u>	<u>Page</u>
1.0 <u>NEED FOR PROPOSED ACTION</u>	
1.1 GENERAL	1
1.2 PROJECT DESCRIPTION	1
1.2.1 <u>Study Authority</u>	1
1.2.2 <u>Location of Existing Project</u>	2
2.0 <u>ALTERNATIVES CONSIDERED</u>	
2.1 NO ACTION	2
2.2 ALTERNATIVE ALIGNMENTS	2
2.3 ALTERNATIVE LEVELS OF PROTECTION	2
2.4 PROPOSED PLAN	3
3.0 <u>AFFECTED ENVIRONMENT</u>	
3.1 STUDY AREA	4
3.2 PHYSIOGRAPHY	4
3.3 GEOLOGY AND SOILS	4
3.4 LAND USE	4
3.5 VEGETATION AND WILDLIFE RESOURCES	5
3.6 WETLANDS	5
3.7 THREATENED AND ENDANGERED SPECIES	5
3.8 HISTORIC RESOURCES	6
3.9 AIR QUALITY	6
3.10 PRIME AND UNIQUE FARMLANDS	6
3.11 HAZARDOUS AND TOXIC WASTES	6
4.0 <u>ENVIRONMENTAL EFFECTS OF THE PROPOSED ACTION</u>	
4.1 GENERAL	8
4.2 LAND USE	8
4.3 VEGETATION	8
4.4 WILDLIFE	8
4.5 WETLANDS	9
4.6 THREATENED AND ENDANGERED SPECIE	9
4.7 HISTORIC RESOURCES	9
4.8 AIR QUALITY	9
4.9 PRIME AND UNIQUE FARMLANDS	9
4.10 HAZARDOUS AND TOXIC WASTES	10

5.0 RELATIONSHIP OF PLAN TO ENVIRONMENTAL REQUIREMENTS 10

6.0 COORDINATION

6.1 PUBLIC INVOLVEMENT 12

6.2 REQUIRED COORDINATION 12

6.3 PUBLIC REVIEW AND COMMENTS 13

6.3.1 Review 13

6.3.2 Comments 13

7.0 CONCLUSIONS 14

8.0 REFERENCES 14

FIGURE 1. Proposed Levee Alignment

APPENDIX A. COORDINATION

APPENDIX B. EVALUATION OF SECTION 404(b)(1) GUIDELINES - SHORT FORM

APPENDIX C. COMMENTS RECEIVED ON DRAFT REPORT AND ENVIRONMENTAL ASSESSMENT

ENVIRONMENTAL ASSESSMENT

GUADALUPE RIVER at VICTORIA, TEXAS

Section 205 - Small Flood Control Project

1.0 NEED FOR PROPOSED ACTION

1.1 GENERAL

The existing flood control project at Victoria consists of a levee constructed along the east bank of the Guadalupe River in about 1936 to protect a portion of the city. It does not tie into high ground at either end, which allows moderate floods on the river to flank it and flood portions of the city with a 2-year frequency. Some portions of the levee are overgrown with heavy vegetation and trees which have root systems penetrating the levee. The need exists and the City of Victoria has expressed an interest to upgrade the levee system to meet Federal Emergency Management Agency (FEMA) standards and to construct extensions at both the upper and lower ends to provide the FEMA equivalent of a 100-year level of protection.

1.2 PROJECT DESCRIPTION

1.2.1 Study Authority

This study is being conducted under the authority of Section 205 of the Flood Control Act of June 30, 1948, Public Law 858, 80th Congress, which states:

"The Secretary of the Army is authorized to allot from any appropriations heretofore or hereafter made for flood control, not to exceed \$40,000,000 for any one fiscal year, for the construction of small projects for flood control and related purposes not specifically authorized by Congress, which come within the provisions of Section 1 of the Flood Control Act of June 22, 1936, when in the opinion of the Chief of Engineers such work is advisable. The amount allotted for a project shall be sufficient to complete Federal participation in the project. Not more than \$5,000,000 shall be allotted under this section for a project at a single locality. The provisions of local cooperation specified in Section 3 of the Flood Control Act of June 22, 1936, as amended, shall apply. The work shall be complete in itself and not commit the United States to any additional improvement to insure its successful operation, except as may result from the normal procedure applying to projects authorized after submission of preliminary examination and survey reports."

The Galveston District was requested by the Victoria City Manager to investigate the feasibility of upgrading the existing local flood protection levee along the Guadalupe River at Victoria to meet FEMA structural and maintenance standards. An Initial Appraisal was conducted and a determination made that a feasible solution to the problem existed. A full reconnaissance study was conducted and completed in January 1990 (COE, 1990). It recommended that the existing levee be raised, extended north of U.S. Highway 59 along the east bank of the river and tie to high ground, and extend the southern portion of the levee in an easterly direction and tie to high ground.

1.2.2 Location of Existing Project

The City of Victoria is located about 125 miles southeast of Houston and 50 miles inland from the Gulf of Mexico. The existing levee extends along the east bank of the Guadalupe River beginning at U.S. Highway 59 and continuing downstream about 1.4 miles. It was constructed in the 1930's and has received only occasional maintenance along most portions since that time.

2.0 ALTERNATIVES CONSIDERED

2.1 NO ACTION

This alternative of taking no action to resolve the flooding problem would result in the existing levee not being upgraded or extended to meet FEMA standards. Water from the Guadalupe River would continue to flank the levee during moderate floods and inundate portions of the city. The possibility also exists that continued flooding on the Guadalupe River could cause levee failure since some portions are overgrown with heavy vegetation and trees which have root systems penetrating the levee system.

2.2 ALTERNATIVE ALIGNMENTS

A variety of alignments were considered during earlier phases of this study. The initial alignments evaluated for extending the levee both upstream and downstream were situated to avoid developed areas and provide the shortest distance to high ground. Further investigation identified an alignment that would be slightly shorter and would not require as much ponding area for local rainwater runoff as the alignment previously considered. This proposed alignment is identified in Figure 1.

2.3 ALTERNATIVE LEVELS OF PROTECTION

Several levels of flood protection were evaluated and include the 25-year, 50-year, 100-year, 150-year, 217-year (FEMA 100-year), 250-year, and 500-year frequency. The only variation among these plans was the height of levee associated with each.

2.4 PROPOSED PLAN.

The proposed plan will provide a 217-year frequency level of protection to the City of Victoria from flooding of the Guadalupe River. This level is equivalent to the FEMA 100-year frequency level of protection when taking into account the amount of freeboard for the levee and the exceedance probability calculations required by FEMA. It generally includes rehabilitation of the existing levee and extending it both upstream and downstream.

The existing levee begins about 265 feet downstream from the U.S. Highway 59 bridge on the east bank of the Guadalupe River and extends downstream about 1.25 miles.

The first section of new levee begins 300 feet east of East Street and 600 feet south of South Street and extends in a southerly direction for 2,780 feet, southwesterly for 1,380 feet, and northwesterly for 1,620 feet where it ties into the existing levee immediately north of Ben Jordan Street. Two borrow areas will be developed adjacent to the levee alignment and excavated material used for levee construction south of the Southern Pacific railroad. The borrow areas will subsequently be used as a ponding area for local rainwater runoff. An outfall structure will be placed through the levee adjacent to Bottom Street to provide drainage for the ponding area.

The next section of levee construction involves rehabilitation of 790 feet of existing levee. It will be cleared, grubbed, stripped, restored to the 100 year frequency flood elevation, and turfed.

The next 1,450 feet of existing levee will require no work. It is of sufficient height for project needs and maintained to adequately control the growth of brush and trees.

The next 1,120 feet of existing levee will be cleared, grubbed, stripped and raised 1 to 2 feet and turfed. A portion of levee along this reach will also be realigned.

A 320 foot section of new levee, 2 to 3 feet in height above existing ground, will be constructed within the Central Power and Light generating station. The levee will tie into an existing road, which will be raised 3 feet, and continue along that road for 150 feet.

A concrete wall, 145 feet in length and 2 to 3 feet in height will be constructed from the road to an existing steel sheet pile wall. Protection will continue along the existing sheet pile wall for 610 feet. This wall will be raised 6 to 8 inches.

A new 480 foot section of levee will be constructed from the sheet pile wall to the Southern Pacific railroad bridge abutment. This portion section will be 2 to 3 feet in height above existing ground.

The next 1,380 feet of existing levee will be cleared, grubbed, stripped, raised and realigned. It will tie into the U.S. Highway 59 bridge abutment.

A 2,980 foot section of new levee, 3 to 7 feet in height, will be constructed from the bridge abutment at Highway 59 to high ground near the intersection of Victoria and Santa Rosa Streets. A borrow area will be developed between the levee alignment and Victoria Street with material used for levee construction north of the Southern Pacific railroad. The borrow area will also be used as ponding areas and connected to an existing drainage structure near the end of Water Street, west of Highway 59.

Four existing drainage structures will require modification. One is located near the western end of Water Street, west of Highway 59. The other structure is located through the existing levee near the intersection of Glass and Second Streets. The outfall portion of each structure will be modified to stabilize the existing ground and prevent erosion. This will generally include extending the existing concrete structure, installing new gates, and placing stone protection at the lower end of the structure. The remaining structures will have a gatewell added to each.

3.0 AFFECTED ENVIRONMENT

3.1 STUDY AREA

The study area includes the City of Victoria, the Guadalupe River, and adjacent areas. The immediate study area includes the east bank of the Guadalupe River and adjacent areas in the City of Victoria.

3.2 PHYSIOGRAPHY

Victoria is located within the coastal prairie physiographic region of Texas which reaches inland 30 to 60 miles (Blair, 1950). This area is a nearly level, slightly dissected plain with poorly developed drainage. Land elevations along the river south of Victoria are around 55 feet. Primary topography features include the river channel and numerous small oxbows and abandoned channels within the floodplain.

3.3 GEOLOGY AND SOILS

At Victoria, about 30 miles inland from Guadalupe Bay, the river becomes entrenched 10 to 15 feet into Pleistocene Age, Beaumont Clay formation which averages about 700 feet in thickness. This formation consists of plastic, poorly bedded clay with pockets and layers of sand. The river valley is overlain with deposits from upland erosion and contains extensive deposits of sand and gravel of commercial value in the vicinity of the city.

3.4 LAND USE

Land use in the project area is devoted mostly to urban development. The surrounding region is occupied primarily by agricultural land and brushland. Woodlands are common along the banks

of the Guadalupe River, oxbows, and abandoned channels. Areas of current and abandoned sand and gravel mining are also common in this area. Brushland is usually associated with rangeland and abandoned agricultural land.

3.5 VEGETATION AND WILDLIFE RESOURCES

The distribution of vegetation and wildlife in the project area is influenced by the general land use which is dominated by urban development and agriculture production. Urban development frequently occurs immediately adjacent to the Guadalupe River and is the primary factor which controls the growth of vegetation and abundance of wildlife in such areas. Agriculture production and the occurrence of brushland are additional factors which control abundance and distribution of these resources.

The banks of the Guadalupe River and associated floodplain provide the greatest abundance of wooded areas. Other sites such as fence rows and areas adjacent to roads and drainage ditches are occupied by stands of brush and trees of various sizes. Abandoned sand and gravel pits which have revegetated with various species of brush and trees over the years are also common in the area. The most common species occurring in the project area include pecan (Carva illinoensis), box elder (Acer negundo), cedar elm (Ulmus crassifolia), red buckeye (Aesculus parvia) and roughleaf dogwood (Cornus drummondi) (Gould, 1975).

As a result of extensive urban development, the area offers only limited food and ground cover for those wildlife species which have adapted to human disturbance. This would include a variety of rodents, mammals, and songbirds.

3.6 WETLANDS

Wetland resources of the immediate project area generally include the Guadalupe River and associated oxbows and abandoned channels. Portions of the river bank and other frequently flooded areas may also be classified as wetlands. However, no precise determination has been accomplished since virtually all project related activities will be accomplished on high ground.

3.7 THREATENED AND ENDANGERED SPECIES

Species listed as threatened or endangered which could occur in the general project area and adjacent coastal areas include the Brown pelican (Pelecanus occidentalis), Peregrine falcon (Falco peregrinus), Bald eagle (Haliaeetus leucocephalus), Whooping crane (Grus americana), and several sea turtles. Since the city of Victoria is located about 30 miles from any coastal waters, none of the sea turtles would be found in the immediate project area. The pelican, falcon, eagle, and whooping crane may be observed occasionally passing through the area and would not be a permanent or seasonal resident.

3.8 HISTORIC RESOURCES

A field survey for historic resources of the proposed levee alignment and borrow pits has been accomplished. A previously unrecorded prehistoric archeological site was identified and a determination made that the site was not potentially eligible for the National Register of Historic Places.

3.9 AIR QUALITY

The project area is situated within the Texas Air Quality Control Region No. 5, and an air quality monitoring station is maintained by the Texas Air Control Board (TACB) in Victoria. Pursuant to the Section 107 of the Clean Air Act of 1977, the EPA and TACB determine whether each area of the state is attaining or not attaining required primary and secondary air quality standards. Federal standards have been established in the Victoria area for sulfur dioxide, carbon monoxide, nitrogen dioxide, total suspended particulates, and ozone. Information provided by the TACB identified the area as having an attainment status for carbon monoxide, sulfur dioxide, nitrogen dioxide and particulates (TACB, 1991). Diffusion conditions in the immediate project area are good with wind speeds averaging about 7 to 10 miles per hour from the south to southeast which is the direction of the Gulf of Mexico.

3.10 PRIME AND UNIQUE FARMLANDS

The general project area contains large acreages of agricultural lands. Because of the importance of agriculture to the economy and the continuing encroachment by development, the U.S. Department of Agriculture Natural Resource Conservation Service (NRCS), has been identifying and inventorying prime and unique farmlands. Prime farmland, as defined by the NRCS, is land best suited to producing food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and moisture supply needed to economically produce a sustained high yield of crops when it is treated and managed using acceptable farming methods. About 153,000 acres, or 27 percent of the land area, in Victoria County meet the requirements for prime farmland (USDA, 1982). These soils include the Victoria, Lake Charles, Meguin, and Trinity units which are utilized for cultivation of crops, principally grain sorghum, cotton, and corn. The Meguin soil unit is the only prime farmland soil that occurs in the immediate project area.

3.11 HAZARDOUS AND TOXIC WASTES

Hazardous, toxic, and radioactive waste (HTRW) assessment methodology utilized to determine the existence or probability of encountering unanticipated hazardous or solid waste sites during construction included preliminary site visits, review of available aerial photographs, a search of city, county, state, and federal historical records, interviews with local and agency personnel, and site visits.

The northern section of the proposed levee begins at high ground in a vacant lot between Santa Rosa and Constitution Streets and runs west and south to Highway 59. Originally owned by the SLB & M Railroad, Union Pacific System currently owns the narrow strip of land. In the northern section adjacent to Juan Linn St are the remains of what appear to be a loading dock associated with the railroad. Observing the condition of the ground in this area was difficult, as the City has been using the land for dumping trees, wood chips, and street sweepings. Land west of the stormwater creek is a former City landfill. The only apparent activity at the old landfill site is a police firing range. North of the former landfill and adjacent to the proposed levee is a firefighter training facility. Land use to the east of this section of the proposed levee is primarily residential, with the exception of an industrial uniform laundry and supply business (Cintas). The southern end of this levee section runs adjacent to residential areas, two small commercial businesses, a flea market and home repair store.

The next project section contains the existing levee, which runs in a southerly from high ground at the Highway 59 river bridge to the Southern Pacific Railroad tracks. Land use in this reach is primarily residential. The northern section of the existing levee runs directly behind a small metal building once housing Riverside Auto Parts. It is believed that the old auto parts building is currently used as a private welding shop.

The next levee section follows the existing levee along the river from the railroad tracks around CP&L property. In the middle of this reach, the levee angles around two containment berms - one used to surround CP&L's emergency fuel oil storage tank and the other for a planned fuel oil storage tank. Approximately 15 years ago the empty containment area was used when a boiler was cleaned and had to be drained. In December 1990, a small quantity of gasoline flowed into the Guadalupe River when a fuel line from a storage tank broke on CP&L property. Records indicate that CP&L has three permitted effluent discharges to the Guadalupe River. The levee also covers the effluent pipe and borders the chlorine contact chamber of the old wastewater treatment plant.

This next levee section runs from the southern property line of CP&L to SW Ben Jordan Street. One residence sits next to the proposed levee on SW Ben Jordan Street. Wooded areas and overgrown pasture land comprises the majority of the reach.

The next levee section runs from SW Ben Jordan Street southeast to Hiller Street and east-northeast to Bottom Street, a total length of 2955 feet. The land appears to be old pasture that is currently overgrown with brush and undeveloped. Plats for the G. L. Wigington lease located in the southern area of this reach indicate oil and gas drilling activities from 1980 to 1982. Records indicate the plugged well may be located in an area designated for borrow material.

The next levee section extends across Bottom Street, turns north to SW Ben Jordan Street, and ties into high ground southwest of the intersection of South Street and Union Pacific railroad tracks. The majority of the land in this reach is agricultural, with the exception of a small wooded tract and overgrown pasture at the northern end.

4.0 ENVIRONMENTAL EFFECTS OF THE PROPOSED ACTION

4.1 GENERAL

The proposed project will provide the FEMA 100-year frequency level of protection to the city of Victoria from flooding along the Guadalupe River. This floodplain will be reduced in size, which would effectively remove many structures from flooding associated with such frequency storms. Detailed hydrology and hydraulic studies have also been conducted. Results of these studies indicated that no increase in flooding of other areas along the Guadalupe River would occur. Impacts will primarily include changes in land use and the removal of some vegetation and displacement of associated wildlife. Such impacts are not considered significant based on the quantity of identical resources that occur in the same area.

4.2 LAND USE

The primary impacts of the project on land use will be the conversion of agricultural land, brushland, wooded areas, and urban land to flood protection levees and borrow pits. An estimated 22.2 acres of agricultural land will be converted to levee and borrow pits or drainage ditches. About 15.4 acres of brushland will also be converted to levee and borrow pits or drainage ditches. Approximately 6.8 acres of wooded areas will be converted. This includes about 3.9 acres along the existing levee which will be cleared and 2.9 acres lost to construction of the new sections of levee. About 17.4 acres of urban land will be converted to levee and borrow pits. Most of this acreage (12.8 acres) currently exists as an abandoned sand and gravel pit. Overall landuse within the project area should not be adversely impacted.

4.3 VEGETATION

The vegetation resource of greatest value to wildlife in the project area include wooded areas and brushland. About 22.2 acres of these resources will be affected by the proposed project. The wooded areas include about 3.9 acres along the existing levee and 2.9 acres along the north and south extensions. These areas, whether along the existing levee or associated with the extensions are all immediately adjacent to urban areas. The brushland which totals about 15.4 acres generally includes rangeland and abandoned agriculture land. Impacts to these resources are not considered significant.

4.4 WILDLIFE

Since the woodlands and brushland are primarily adjacent to urban development or occasionally disturbed by human activities, they are of limited value to many species of wildlife. Those species that commonly utilize such areas will likely be displaced or destroyed. Though some loss could be expected, it is not considered significant.

4.5 WETLANDS

Wetland resources which will be impacted include portions of the river bank immediately below the existing drainage structures to be modified. Two areas totaling about 3,000 square feet, or less than 0.07 acres, will be impacted by construction of the new outfall structures. These areas will be filled with a concrete drop structure and riprap at the end of the structure. They do not provide valuable habitat to wildlife species. Therefore, impacts to this resource are not considered significant.

4.6 THREATENED AND ENDANGERED SPECIES

The pelican, falcon, eagle, and whooping crane may be observed occasionally passing through the area and would not be a permanent or seasonal resident. None of these species will be adversely impacted by the proposed project since they are not permanent or seasonal residents.

4.7 HISTORIC RESOURCES

No known historic resources were identified in the immediate area of the proposed project. A field survey of the proposed levee alignment and borrow pits identified only one previously unrecorded prehistoric archeological site. Construction of the proposed levee will impact the eastern edge of the site. However, a determination has been made that it was not potentially eligible for the National Register of Historic Places. Therefore, no further action is necessary to mitigate project related impacts to the site. The Texas State Historic Preservation Officer has concurred in this determination.

4.8 AIR QUALITY

The proposed project may cause some temporary adverse effects to air quality. Exhaust emissions from machinery and equipment will result from project construction. However, these emissions will have no significant effect on air quality in the area because of good average wind speeds which should quickly dissipate any accumulation of exhaust fumes.

4.9 PRIME AND UNIQUE FARMLANDS

The proposed project lies entirely on Meguin soils. About 44.4 acres will be impacted which accounts for less than 0.03 percent of this soil type within Victoria County. More than 50 acres of this soil type currently in agricultural production will be protected from periodic flooding of the Guadalupe River. The net impact of the proposed project on prime and unique farmlands is expected to be positive with the additional areas protected from flooding.

4.10 HAZARDOUS AND TOXIC WASTES

Project areas exhibiting characteristics of potential HTRW sites are; the northern section with an old railroad spur and remnants of a loading dock, concrete structures and blocks believed to be remnants of a Haliburton petroleum service yard; the second section with the former auto parts shop that is currently a welding shop; the third section with the containment berm at CP&L which was used to contain a release; and the fifth section with the undeveloped land utilized for petroleum exploration.

Analysis of the data collected on these areas during this preliminary assessment indicates that the overall probability of encountering hazardous or toxic wastes within the project area is considered moderately low to low, with the hazard level for the material encountered considered to be moderately low to low. Although there are no available historical records concerning the railroad spur and associated activities, a visual inspection did not indicate problems in this section. However, caution should be used during clearing and excavation in the railroad spur vicinity to minimize potential problems that could occur in the event there are buried structures or material. Regulatory reports indicate that except for two small releases at CP&L, no known solid or hazardous waste sites or unregulated releases of contaminants have occurred within or adjacent to project lands. The empty containment area at CP&L should not present a problem, as the containment berm is outside the flood levee modification area, and only elevated levels of a few metals (i.e., iron and copper) probably remain inside the containment. If avoidance of the abandoned oil/gas well is not feasible, personnel should coordinate with RRC personnel. Slush pits used to contain drilling fluids/wastes could pose an environmental hazard, depending upon the levels of metals or chemicals/drilling additives found in the pits. However, stressed vegetation, dead zones, or discolored soils were not found in the old oil field during a site visit. It is possible that abandoned debris (piping, machine parts, etc.) associated with drilling activities will be found scattered around the oil and gas lease.

This assessment is partially based on published information. Undetectable environmental risks may be present and not documented by regulatory agency files. While other avenues were utilized to research the projects, this environmental site assessment cannot wholly eliminate uncertainty regarding the potential for recognized environmental conditions in connection with the project. This assessment is intended to reduce, but not eliminate, uncertainty regarding the potential for such conditions. It is therefore recommended that a contingency plan designed to efficiently deal with such an event be prepared prior to the start of project construction.

5.0 RELATIONSHIP TO ENVIRONMENTAL REQUIREMENTS

This assessment has been prepared to satisfy the requirements of all applicable environmental laws and regulations. It conforms to Corps of Engineers regulations, ER 200-2-2 (Environmental Quality: Policy and Procedures for Implementing NEPA) and the Council on Environmental Quality (CEQ) National Environmental Policy Act regulations (40 CFR Part 1500). The following is a brief discussion of environmental review and consultation requirements applicable to this project.

National Environmental Policy Act

This Environmental Assessment has been prepared in accordance with Council on Environmental Quality Regulations (40 CFR 1508.9) to aid in complying with NEPA since it has been determined that no EIS is necessary. The EA has helped to identify that environmental impacts associated with the proposed plan are not significant.

Fish and Wildlife Coordination Act

In accordance with this Act, the Corps of Engineers will consult with the U.S. Fish and Wildlife Service (USFWS), with a view to the conservation of wildlife resources by prevention of their direct or indirect loss and damage due to the proposed project. A Planning Aid Letter (Appendix A) was received from the USFWS which provided information on endangered species and vegetation along the existing levee.

Clean Water Act

Compliance with the Clean Water Act is being accomplished in accordance with Section 404 of the Act. Since the proposed project is being evaluated under the authority of Section 205 of the Flood Control Act of June 30, 1948, and will not be specifically authorized by the Congress, a Public Notice addressing Section 404 requirements was issued and a State Water Quality Certificate was received. A short form section 404(b)(1) evaluation has been prepared and is presented in Appendix B.

Endangered Species Act

The USFWS has furnished information concerning Federally-listed threatened or endangered species that may occur in the project area (Appendix A) and stated that ". . .it appears the project will not significantly impact the endangered or threatened species in the area." A finding of no significant effect on endangered or threatened species of the area has been determined.

National Historic Preservation Act

Historic resource surveys were conducted and coordination with the Texas State Historic Preservation Officer (SHPO) has been accomplished. The SHPO has concurred in the Galveston District's findings that National Register eligible properties will not be impacted by this proposed project (Appendix A).

Executive Order 11988

The primary objective of this order is "the avoidance, to the extent possible, of long and short term adverse impacts associated with the occupancy and modification of the base floodplain and the avoidance of direct and indirect support of development in the base floodplain wherever there is a practicable alternative." Corps of Engineers policy consistent with this order is "to the extent possible, avoid or minimize adverse impacts associated with use of the base floodplain unless there is no practicable alternative." The local sponsor of the project, City of Victoria, would be responsible for regulating construction in the residual 100-year floodplain along the Guadalupe River, as part of the City's continuing program of floodplain management.

Executive Order 11990

Corps of Engineers policy consistent with requirements of this order is to avoid undertaking actions in wetlands that are identified as important, based on wetlands functions, unless it is concluded that no practicable alternatives to the proposed action in wetlands exists. Damage to wetlands will be avoided at all locations except for modifications at two drainage structures. No practical alternatives exist to this specific work. Compliance with this Executive Order was accomplished by issuing a Public Notice and preparing a Section 404(b)(1) Evaluation. A Public Notice was issued in August 1992. The Texas Water Commission also issued a Public Notice in August 1992. No comments were received concerning this action and certification was received from the Commission by letter dated September 29, 1992 (See Appendix B).

6.0 COORDINATION

6.1 PUBLIC INVOLVEMENT.

A Reconnaissance Report was completed in January 1990 and determined that a solution to the flooding problem which is economically justified, engineeringly sound, and environmentally acceptable, was available. A Public Notice was issued on January 11, 1991, identifying that the feasibility phase had been initiated and more detailed engineering, economic, and environmental data would be acquired. Questions and concerns were also solicited by the notice. Preparation of the Detailed Project Report and this EA were accomplished in order to develop the most cost-effective solution to the flooding problem while protecting, to the maximum extent practicable, the Nation's environment. The Draft EA was circulated to seek additional input from agencies and the public concerning the proposed project.

6.2 REQUIRED COORDINATION.

This Environmental Assessment was prepared and coordinated in compliance with the National Environmental Policy Act. Other laws and regulations require specific coordination to

assure all aspects of the environment are fully considered as part of any Federal action. Laws most applicable to this project include the Fish and Wildlife Coordination Act of 1958, the Clean Water Act, Section 7 of the Endangered Species Act, and the National Historic Preservation Act of 1966.

6.3 PUBLIC REVIEW AND COMMENTS.

6.3.1 Review

The Draft EA and Finding of No Significant Impact (FONSI) were circulated for review and comment in February 1992 as part of the Detailed Project Report. Appendix C includes comments received on the report and EA. Comments were received from Environmental Protection Agency; Federal Emergency Management Agency; the State of Texas including the Budget and Planning Office, Texas Historical Commission, Texas Parks and Wildlife Department, Bureau of Economic Geology, Texas Department of Health, Texas Department of Transportation, Texas Soil and Water Conservation Board, and Texas Water Development Board.

6.3.2 Comments

Most comments received on the report and EA were favorable. However, Texas Parks and Wildlife Department expressed concerns with regard to the impacts to brushland and wooded areas and the impacts to ". . .the bottomland soil and plant community occurring along the river in the project area." The Texas Water Development Board expressed concern over sediment runoff controls and revegetation of disturbed areas. The Victoria Soil and Water Conservation District #346 was concerned about draining borrow areas to reduce health problems from stagnant water and mosquitos.

Brushland and wooded areas that will be impacted by the proposed project are strongly influenced by land use practices dominated by urban development, agriculture production, and livestock grazing. Mitigation for such impacts were not considered feasible for a project of this size. Also, the removal of trees along the existing portions of the levee to be upgraded is being accomplished to reestablish the integrity of the system and minimize the potential for future failures.

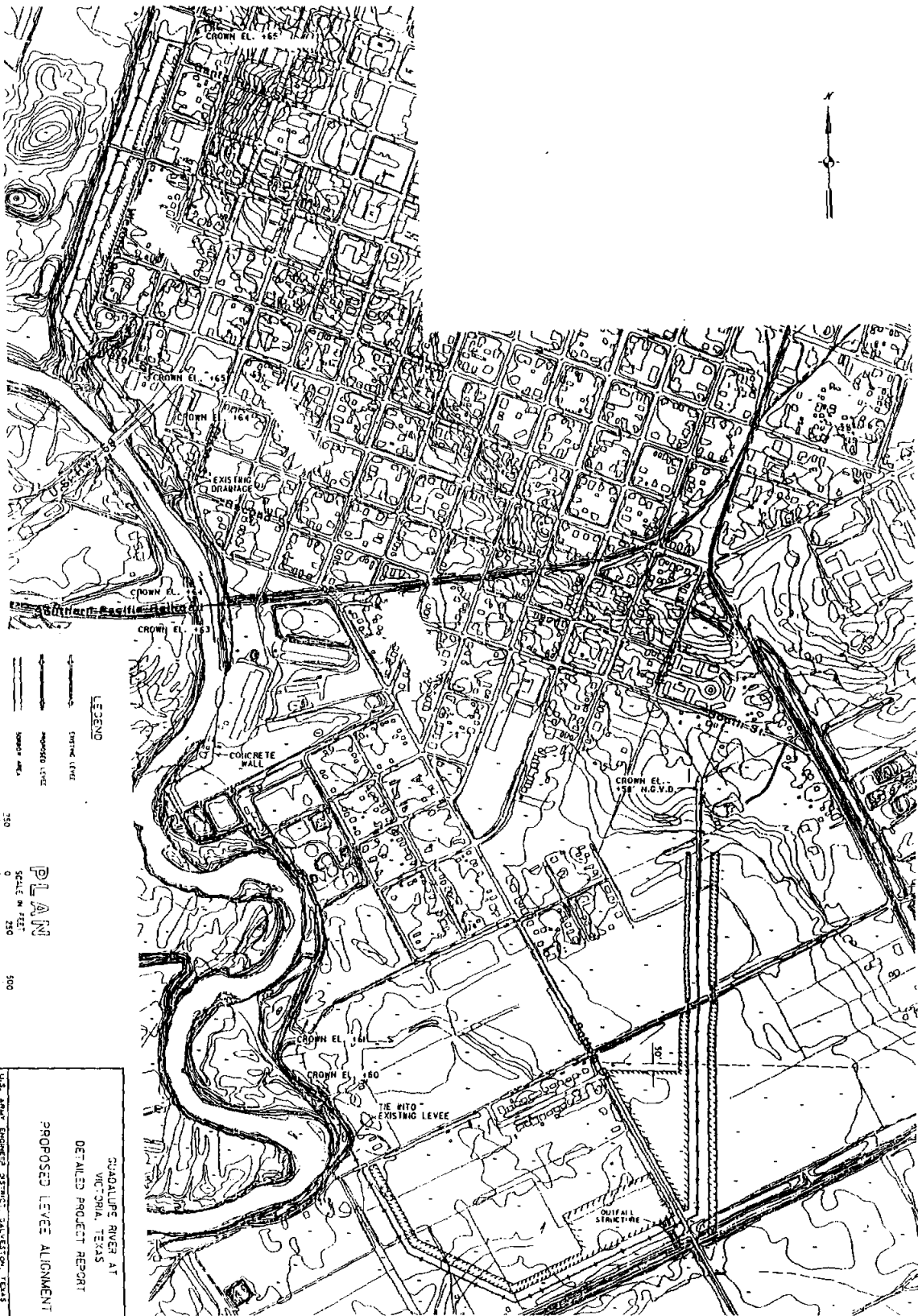
The proposed improvement to the levee system is designed to prevent high river water levels from flooding low areas adjacent to the river and prevent erosion of project features and standing water in borrow areas. Water movement past the project area will not be increased and subsequently impact the characteristics of the bottomland soil and plant community along the river. The project plan provides for revegetation of the levee crown and slopes, ditch slopes, and slopes and bottoms of the borrow areas. Drainage outlets for all borrow pits will be placed at an elevation to prevent the long-term ponding of water and subsequent mosquito and other vector problems.

7.0 CONCLUSIONS

Based on the foregoing environmental assessment, it is concluded that the proposed project to provide the FEMA 100-year frequency level of protection to the City of Victoria from flooding of the Guadalupe River would not have a significant adverse environmental effect on the quality of the human environment. Factors considered included effects on wildlife, wetlands, water quality, threatened and endangered species, cultural resources prime farmlands, air quality, and hazardous and toxic materials. After consideration of various alternatives, the proposed plan is considered to be environmentally acceptable and in the public interest.

8.0 LIST OF REFERENCES

- Blair, W. F. 1950. The biotic provinces of Texas. *Texas J. Sci.* 2:93-117.
- Gould, F. W. 1975. Texas plants - a checklist and ecological summary. MP-585/Rev, Texas Agric. Exp. Sta., Texas A&M Univ., College Station. 121p.
- Texas Air Control Board (TACB), 1991. Ambient air quality standards for Matagorda and Brazoria Counties, Texas, Letter. August 14, 1991.
- U.S. Department of Agriculture (USDA), 1982. Soil Survey of Victoria County, Texas. Soil Conservation Service.
- U.S. Army Corps of Engineers (COE), 1990. Local Flood Protection Levee, Victoria, Texas, Section 205 Reconnaissance Report.



LEGEND

--- EXISTING LEVEE

--- PROPOSED LEVEE

--- CONCRETE WALL

--- ORIGINAL STRUCTURE

PLAN

SCALE IN FEET

0 250 500

QUADALUP RIVER AT VICTORIA, TEXAS
 DETAILED PROJECT REPORT
 PROPOSED LEVEE ALIGNMENT

U.S. ARMY ENGINEER DISTRICT, VICTORIA, TEXAS

Figure 1

APPENDIX A. - COORDINATION

GUADALUPE RIVER at VICTORIA, TEXAS

Section 205 - Small Flood Project

U.S. ARMY ENGINEER DISTRICT

GALVESTON, TEXAS

SEPTEMBER 1995



DEPARTMENT OF THE ARMY
GALVESTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1229
GALVESTON, TEXAS 77553-1229

REPLY TO
ATTENTION OF:

May 23, 1991

Environmental
Resources Branch

Mr. Roy Perez
Field Supervisor
U.S. Fish and Wildlife Service
c/o CCSU, Campus Box 338
6300 Ocean Drive
Corpus Christi, Texas 78412

Dear Mr. Perez:

The Corps of Engineers, Galveston District (COE), is preparing an Environmental Assessment (EA) of the impacts of constructing an extension of a flood protection levee for Victoria, Texas, along the Guadalupe River. To complete the EA, the COE needs a current list of threatened or endangered species that may occur in the area of construction near Victoria. A map of the levee alignment and proposed borrow areas for fill material is enclosed for your information.

Thank you for helping the COE meet its obligations under Section 7 of the Endangered Species Act. If you have any questions, please contact Mr. Terry Roberts at FTS 527-6035 or 409/766-3035.

Sincerely,

William Fickel, Jr.
Chief, Planning Division

Enclosure



UNITED STATES
DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
ECOLOGICAL SERVICES
c/o CCSU, Campus Box 338
6300 Ocean Drive
Corpus Christi, Texas 78412

June 24, 1991

Mr. William Fickel, Jr.
Chief, Planning Division
Department of the Army
Galveston Director, Corps of Engineers
PO Box 1229
Galveston, TX 77553-1229

Consultation No. 2-11-91-I-181

Dear Mr. Fickel:

This responds to your letter dated May 23, 1991, regarding the effects of the proposed Victoria Levee project on species Federally listed or proposed for listing as threatened or endangered species occurring in Victoria County, Texas.

The proposed project consist of activities associated with constructing an extension of a flood protection levee for Victoria, Texas. We understand that the COE will prepare an Environmental Assessment (EA) on the possible impacts of the levee project.

A field visit was conducted in June of this year by Service biologists and it appears the project will not significantly impact the endangered or threatened species in the area. However, along the existing levee, there are stands of large pecan and other deciduous bottomland hardwood trees that do provide resting, feeding and nesting habitat for many species. Every effort should be made to avoid destruction of these native areas where practical.

This office looks forward to reviewing and commenting on the forthcoming EA and welcomes the opportunity to work with the COE in such matters. If we can be of further assistance, please contact Tom Serota of our office at (512) 888-3346 or FTS 529-3346.

Sincerely,

ROGELIO PERES
Field Supervisor

cc:
Regional Director, U.S. Fish & Wildlife Service, Albuquerque, NM (FWE/SE)

May 30, 1991

Environmental Resources
Branch

James E. Bruseth, Ph.D.
Deputy
State Historic Preservation Officer
Texas Historical Commission
P.O. Box 12276
Austin, Texas 78711

Dear Dr. Bruseth:

Reference is made to the Victoria Levee Project, Guadalupe River at Victoria, Victoria County, Texas. The Galveston District, Corps of Engineers proposes to extend the existing flood protection levee in Victoria to the north and south to provide 100-year flood protection for the city.

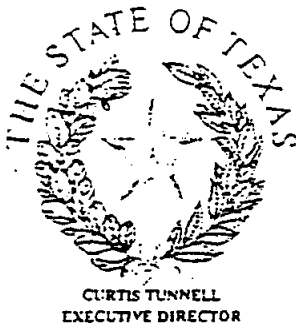
The proposed new levee alignments and borrow areas were surveyed for cultural resources May 14-15, 1991. A report of survey with locational maps and a site survey form for 41VT104, a newly recorded prehistoric archeological site, are enclosed. Proposed levee construction will impact the eastern edge of site 41VT104. In our opinion 41VT104 is not potentially eligible for the National Register of Historic Places and therefore we do not propose to mitigate project impacts to the site.

We request your review of the enclosed survey report and documentation and your concurrence in our finding that site 41VT104 is not potentially eligible for the National Register of Historic Places. Please direct any questions to Ms. Carolyn Good at (409) 766-3038.

Sincerely,

William Fickel, Jr.
Chief, Planning Division

Enclosure



TEXAS HISTORICAL COMMISSION
P.O. BOX 12276 AUSTIN, TEXAS 78711 (512)463-6100

June 24, 1991

Mr. William Fickel, Jr.
Chief, Planning Division
Department of the Army
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, TX 77553-1229

RE: Victoria Levee Project, Guadalupe River at Victoria
County, Tx (COE-VD, A5, A6, D1d)

Dear Sir:

We are in receipt of an archeological report concerning the above referenced undertaking. After reviewing the report we conclude that, as described, the proposal should not affect sites on the National Register of Historic Places, nor any site determined eligible for the National Register. Please be advised that any artifacts collected during the cultural resources survey should be curated at an adequate repository as defined in the Secretary of Interior's regulations entitled "Curation of Federally-Owned and Administered Archeological Collections" (36CFR79).

The project may continue without further consultation with this office. However, it is possible that buried archeological deposits may be present in the project area. If artifacts are encountered during construction, work should cease in the immediate area; work can continue in the project area where no archeological deposits are present. The Advisory Council on Historic Preservation should be contacted in accordance with 36CFR800.11.b.2. Please also notify the State Historic Preservation Officer (512/463-6096).

Sincerely,

James E. Bruseth, Ph.D.
Deputy State Historic Preservation Officer

BM/JEB/ft

APPENDIX B. SECTION 404 EVALUATION

GUADALUPE RIVER at VICTORIA, TEXAS

Section 205 - Small Flood Project

U.S. ARMY ENGINEER DISTRICT

GALVESTON, TEXAS

SEPTEMBER 1995

EVALUATION OF SECTION 404(b)(1) GUIDELINES - SHORT FORM

Guadalupe River at Victoria, Texas

Section 205 - Small Flood Control Project

1. Review of Compliance (230.10(a)-(d))

- a. The discharge represents the least environmentally damaging practicable alternative and if in a special aquatic site, the activity associated with the discharge must have direct access or proximity to, or be located in the aquatic ecosystem to fulfill its basic purpose (if no, see Section 2 and information gathered for EA alternative);

YES X NO

- b. The activity does not appear to: 1) Violate applicable state water quality standards or effluent standards prohibited under Section 307 of the CWA; 2) jeopardize existence of federally listed endangered or threatened species or their habitat; and 3) Violate requirements of any federally designated marine sanctuary (if no, see Section 2b and check responses from resource and water quality certifying agencies);

YES X NO

- c. The activity will not cause or contribute to significant degradation of waters of the U.S. including adverse effects on human health, life stages of organisms dependent on the aquatic ecosystem, ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values (if no, see values, Section 2);

YES X NO

- d. Appropriate and practicable steps have been taken to minimize potential adverse impacts of the discharge on the aquatic ecosystem (if no, see Section 5);

YES X NO

2. Technical Evaluation Factors (Subparts C-F) (Where a significant category is checked, add explanation below.)

	N/A	NOT SIGNIFICANT	SIGNIFICANT
a. Physical and Chemical Characteristics of the Aquatic Ecosystem (Subpart C)			
1) Substrate impacts	___	<u>X</u>	___
2) Suspended particulates/turbidity impacts	___	<u>X</u>	___
3) Water column impacts	___	<u>X</u>	___
4) Alteration of current patterns and water circulation	<u>X</u>	___	___
5) Alteration of normal water fluctuations/hydroperiod	___	<u>X</u>	___
6) Alteration of salinity gradients	<u>X</u>	___	___
b. Biological Characteristics of the Aquatic Ecosystem (Subpart D)			
1) Effect on threatened/endangered species and their habitat	___	<u>X</u>	___
2) Effect on the aquatic food web	___	<u>X</u>	___
3) Effect on other wildlife (mammals, birds, reptiles and amphibians)	___	<u>X</u>	___
c. Special Aquatic Sites (Subpart E)			
1) Sanctuaries and refuges	<u>X</u>	___	___
2) Wetlands	___	<u>X</u>	___
3) Mudflats	<u>X</u>	___	___
4) Vegetated shallows	<u>X</u>	___	___
5) Coral reefs	<u>X</u>	___	___
6) Riffle and pool complexes	<u>X</u>	___	___
d. Human Use Characteristics (Subpart F)			
1) Effects on municipal and private water supplies	___	<u>X</u>	___
2) Recreation and Commercial fisheries impacts	___	<u>X</u>	___

- | | | | |
|---|---------------|---------------|---------------|
| 3) Effects on water-related recreation | <u> X </u> | <u> </u> | <u> </u> |
| 4) Aesthetic impacts | <u> </u> | <u> X </u> | <u> </u> |
| 5) Effects on parks, national and historical monuments, national seashores, wilderness areas, research sites, and similar preserves | <u> X </u> | <u> </u> | <u> </u> |

3. Evaluation of Dredged or Fill Material (Subpart G)

a. The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material. (Check only those appropriate.)

- | | |
|--|---------------|
| 1) Physical characteristics | <u> X </u> |
| 2) Hydrography in relation to known or anticipated sources of contaminants | <u> X </u> |
| 3) Results from previous testing of the material or similar material in the vicinity of the project | <u> </u> |
| 4) Known, significant sources of persistent pesticides from land runoff or percolation | <u> X </u> |
| 5) Spill records for petroleum products or designated (Section 311 of CWA) hazardous substances | <u> X </u> |
| 6) Other public records of significant introduction of contaminants from industries, municipalities or other sources | <u> X </u> |
| 7) Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man-induced discharge activities | <u> X </u> |
| 8) Other sources (specify) | <u> </u> |

List appropriate references.

b. An evaluation of the appropriate information in 3a above indicates that there is reason to believe the proposed dredged or fill material is not a carrier of contaminants, or that levels of contaminants are substantively similar at extraction and disposal sites and not likely to degrade the disposal sites, or the material meets the testing exclusion criteria.

YES X NO

4. Disposal Site Delineation (230.11)(f)

a. The following factors as appropriate, have been considered in evaluating the fill site:

- | | |
|---|-----------|
| 1) Depth of water at disposal site | <u>NA</u> |
| 2) Current velocity, direction and variability at disposal site | <u>NA</u> |
| 3) Degree of turbulence | <u>NA</u> |
| 4) Water column stratification | <u>NA</u> |
| 5) Discharge vessel speed and direction | <u>NA</u> |
| 6) Rate of discharge | <u>NA</u> |
| 7) Fill material characteristics (constituents, amount, and type of material, settling velocities | <u>X</u> |
| 8) Number of discharges per unit of time | <u>NA</u> |
| 9) Other factors affecting rates and patterns of mixing (specify) | <u>NA</u> |

List appropriate references.

b. An evaluation of the appropriate factors in 4a above indicates that the disposal site and/or size of mixing zone are acceptable.

YES NA NO __

5. Actions to Minimize Adverse Effects (Subpart H)

All appropriate and practicable steps have been taken, through application of recommendations of 230.70-230.77 to ensure minimal adverse effects of the proposed discharge.

YES X NO __

6. Factual Determination (230.11) A review of appropriate information as identified in items 2-5 above indicates that there is minimal potential for short or long-term environmental effects of the proposed discharge as related to:

a. Physical substrate at the disposal site (review sections 2a, 3, 4, and 5 above)

YES X NO __

b. Water circulation, fluctuation and salinity (review sections 2a, 3, 4, and 5)

YES X NO __

c. Suspended particulates/turbidity (review sections 2a, 3, 4, and 5)

YES X NO __

d. Contaminant availability (review sections 2a, 3, and 4)

YES X NO

e. Aquatic ecosystem structure and function (review sections 2b and c, 3, and 5)

YES X NO

f. Disposal site (review sections 2, 4, and 5)

YES X NO

g. Cumulative impact on the aquatic ecosystem

YES X NO

h. Secondary impacts on the aquatic ecosystem

YES X NO

7. Evaluation Responsibility

a. This evaluation was prepared by: David Petit

Position: Environmental Specialist

Date: _____

b. This evaluation was reviewed by: Richard Medina

Position: Chief, Environmental Resources Branch

Date: _____

8. Findings

a. The proposed disposal site for discharge of dredged or fill material complies with the Section 404(b)(1) Guidelines.

X

b. The proposed disposal site for discharge of dredged or fill material does not comply with the Section 404(b)(1) Guidelines for the following reason(s):

- 1) There is a less damaging practicable alternative. ___
- 2) The proposed discharge will result in significant degradation of the aquatic ecosystem. ___
- 3) The proposed discharge does not include all practicable and appropriate measures to minimize potential harm to the aquatic ecosystem. ___

Date

James M. Kieslich
Chief, Planning and
Environmental Division

John Hall, Chairman
Pam Reed, Commissioner
Peggy Garner, Commissioner

TEXAS WATER COMMISSION

PROTECTING TEXANS' HEALTH AND SAFETY BY PREVENTING AND REDUCING POLLUTION

September 29, 1992

Mr. William Fickel, Jr.
Chief, Planning Division
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, Texas 77553

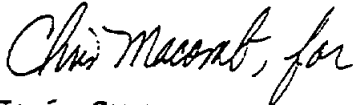
Dear Mr. Fickel:

In response to Corps request, dated August 11, 1992, for a Section 401 water quality certification for the Section 205 Small Flood Control Project (Victoria Levee), the Commission issued notice of the request pursuant to Title 31 TAC, Chapter 279 on August 26, 1992. The Commission has not received any public comment or request for public hearing; therefore, this certification is issued pursuant to the provisions of Section 401 of the Clean Water Act. We certify that the project will not cause a violation of established Texas Water Quality Standards. This certification is limited to those water quality considerations under the jurisdiction of this agency according to the various statutes which this agency administers.

Our review was limited to the information provided in Main Report and Environmental Assessment with Appendices. No review of property rights, location of property lines, nor the distinction between public and private ownership has been made and this certification may not be used in any way with regard to questions of ownership.

We appreciate your cooperation in this matter, and if we can be of additional assistance, please contact Mr. Charles Eanes, Permits Section, Watershed Management Division at 512/463-8245.

Sincerely,



Jesús Garza
Executive Director

APPENDIX C.

COMMENTS RECEIVED ON DRAFT REPORT AND
ENVIRONMENTAL ASSESSMENT

GUADALUPE RIVER at VICTORIA, TEXAS

Section 205 - Small Flood Project

U.S. ARMY ENGINEER DISTRICT

GALVESTON, TEXAS

SEPTEMBER 1995



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

AUG 31 1992

Mr. William Fickel, Jr.
Chief, Planning Division
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

Dear Mr. Fickel:

The Environmental Protection Agency (EPA) Region 6 has reviewed your Environmental Assessment (EA) and unsigned Finding of No Significant Impact concerning local flood protection on the Guadalupe River at Victoria, Texas. The proposed project involves rehabilitation of the existing levee and extending it both upstream and downstream.

As implementation of this project would result in minimal impacts to fish and wildlife resources, endangered species, cultural resources and wetlands, EPA has no objection to the proposed work.

Thank you for the opportunity to provide these comments. If you have any questions concerning EPA's review of this project, please contact Darlene Coulson at 214/655-2260.

Sincerely yours,


Norm Thomas
Chief
Federal Activities Branch (6E-F)



Federal Emergency Management Agency

Region VI
Federal Regional Center
800 North Loop 288
Denton, TX 76201-3698

NTH

October 15, 1992

William Fickel, Jr.
Chief, Planning Division
U. S. Army Corps of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

Dear Mr. Fickel:

This will respond to your request for review and comment on your draft of the Detailed Project Report and Environmental Assessment with unsigned Finding of No Significant Impact for the Local Flood Protection Levee at Victoria, Texas.

The City of Victoria currently participates in the National Flood Insurance Program (NFIP). Approval and guidelines for development in a floodplain are to be based upon provisions of the community's floodplain management ordinances. Issuance of applicable permits would apply to City, State, or Federally sponsored projects.

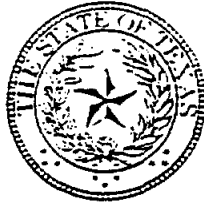
You have already identified that the proposed levee improvements are located within a 100-year floodplain. If the proposed project will result in the modification of the existing floodplain conditions within the community, that community is required under the NFIP to develop and submit a Request for Letter of Map Revision (LOMR) to our office as soon as practicable, but not later than six months after new condition information becomes available. Floodplain modifications are to be outlined by submitting technical or scientific data in accordance with Part 65.3 of the NFIP Regulations.

If we can be of further assistance, please feel free to contact this office by writing to the above address, or calling 817-898-5127.

Sincerely,

Carlton R. Watts
Natural Hazards
Program Specialist

Enclosure



STATE OF TEXAS
OFFICE OF THE GOVERNOR
AUSTIN, TEXAS 78711

ANN W. RICHARDS
GOVERNOR

October 2, 1992

Mr. William Fickel, Jr.
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, TX 77553-1229

RE: TX-R-92-08-12-0002-50-00 / GUADALUPE RIVER FLOOD PROJECT AT VICTORIA, TX

Dear Applicant:

Your environmental impact statement for the project referenced above has been reviewed. The comments received are summarized below and are attached.

The Bureau of Economic Geology recommended the 1992 flood year be accounted in project design and implementation, the Texas Department of Health recommended funding, the Historical Commission has no objections to the project, the Department of Transportation noted no negative effects on the highway system, and the Soil and Water Conservation Board commented the project may increase flooding in the Green Subdivision and on the west side of the Guadalupe River. TSSWCB also found some discrepancies in the report, which are listed in their comments.

We appreciate the opportunity afforded to review this document. Please let me know if we can be of further assistance.

Sincerely,

A handwritten signature in cursive script, appearing to read "Phyllis Ornel".

T. C. Adams, State Single Point of Contact

TCA//pon

Enclosures



Texas Department of Health

David R. Smith, M.D.
Commissioner

1100 West 49th Street
Austin, Texas 78756-3199
(512) 458-7111

Robert A. MacLean, M.D.
Deputy Commissioner

Members of the Board

Ron J. Anderson, M.D., F.A.C.P., Chairman
Raleigh R. White IV, M.D., Vice-Chairman
Oliver R. Smith, Jr., D.C., Secretary
Joan Wood Biggerstaff
Robert E. Bonham, M.D.
Frank Bryant, Jr., M.D., F.A.A.F.P.
Ramiro R. Casso, M.D.
David L. Collins, P.E.
Gill Harber, D.D.S.
Larry D. Krupala
Donald M. Peterson, D.O., F.A.C.G.P.
Susan B. Piace, O.D.
William D. Poteet III, F.A.C.H.E.
Milton L. Risinger, D.V.M.
William A. Scott, M.S.W.
Barbara T. Slover, R.Ph.
Ruth F. Stewart, R.N.C.

August 26, 1992

Mr. Tom Adams
State Single Point of Contact
Governor's Budget and Planning Office
P.O. 12428
Austin, Texas 78711

Re: GUADALUPE RIVER FLOOD PROJECT AT VICTORIA, TEXAS, from Galveston
District Corps of Engineers (SAI#: TX-R-92-08-12-0002-50-00)

Dear Mr. Adams:

The Texas Department of Health has completed its staff review of the above referenced document and recommends funding for this proposal.

We appreciate the opportunity to review and comment on this proposal. If I can be of any further assistance, please advise me.

Sincerely,

A handwritten signature in cursive script, appearing to read "Robert A. MacLean".

Robert A. MacLean, M.D.
Deputy Commissioner



CURTIS TUNNELI
EXECUTIVE DIRECTOR

TEXAS HISTORICAL COMMISSION
P.O. BOX 12276 AUSTIN, TEXAS 78711 (512)463-6100
DEPARTMENT OF ANTIQUITIES PROTECTION

September 4, 1992

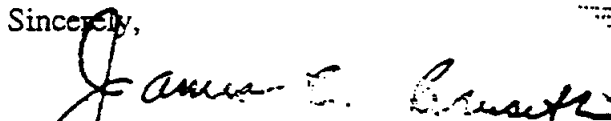
Mr. T.C. Adams, State Single Point of Contact
Governor's Office of Budget and Planning
P.O. Box 12428
Austin, TX 78711

Re: Environmental Assessment Report, Guadalupe River Flood Project at Victoria,
SAI/EIS#: TX-R-92-08-12-0002-50-00, Victoria County, Texas (COE-VD, F2, F31)

Dear Sir:

Thank you providing a copy of the above referenced document. In June 1991, our staff reviewed the results of an archeological survey that was undertaken by the Galveston District Corps of Engineers for this project. Although one archeological site, 41VT104, was found in the proposed recommended levee plan area, it was determined by the Corps and our staff that the site is not eligible for inclusion in the National Register of Historic Places. We have enclosed a copy of our letter (see attachment) in response to the archeological survey report.


Sincerely,


James E. Bruseth, Ph.D.
Deputy State Historic Preservation Officer

DJP/TKP/JEB/djp

attachment

Sincerely,


Timothy K. Pertulla, Ph.D.
Assistant Director for Antiquities Review



TEXAS HISTORICAL COMMISSION
P.O. BOX 12276 AUSTIN, TEXAS 78711 (512)463-6100

June 24, 1991

Mr. William Fickel, Jr.
Chief, Planning Division
Department of the Army
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, TX 77553-1229

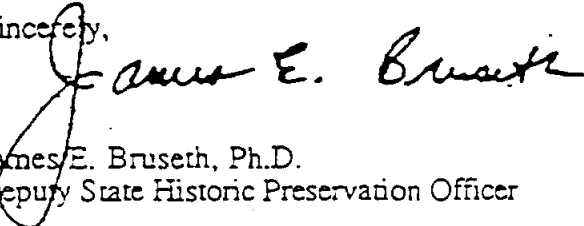
RE: Victoria Levee Project, Guadalupe River at Victoria
County, Tx (COE-VD, A5, A6, D1d)

Dear Sir:

We are in receipt of an archeological report concerning the above referenced undertaking. After reviewing the report we conclude that, as described, the proposal should not affect sites on the National Register of Historic Places, nor any site determined eligible for the National Register. Please be advised that any artifacts collected during the cultural resources survey should be curated at an adequate repository as defined in the Secretary of Interior's regulations entitled "Curation of Federally-Owned and Administered Archeological Collections" (36CFR79).

The project may continue without further consultation with this office. However, it is possible that buried archeological deposits may be present in the project area. If artifacts are encountered during construction, work should cease in the immediate area; work can continue in the project area where no archeological deposits are present. The Advisory Council on Historic Preservation should be contacted in accordance with 36CFR800.11.b.2. Please also notify the State Historic Preservation Officer (512/463-6096).

Sincerely,


James E. Bruseth, Ph.D.
Deputy State Historic Preservation Officer

BM/JEB/ft



Texas Department of Transportation

DEWITT C. GREER STATE HIGHWAY BLDG. • 125 E. 11TH STREET • AUSTIN, TEXAS 78701-2483 • (512) 463-8585

September 16, 1992

D-8E 854

TX-R-92-08-12-002-50-00

Guadalupe River Flood Project
Environmental Assessment Review

Mr. T. C. Adams
State Single Point of Contact
Governor's Office of Budget and Planning
P. O. Box 12428
Austin, Texas 78711

Dear Sir:

Reference is made to the environmental assessment prepared by the U. S. Army Corps of Engineers, Galveston District, and transmitted by your review notification of August 12, 1992. This assessment was forwarded to the Department's Yoakum district office for review, and they offer the following comments:

1. The proposal should have no negative effects on the highway system and should help alleviate the flooding problem at U. S. 59 and Water Street.
2. Table 2 on page 12 states that U. S. 59 is closed at the 28-29 foot stage. In 1991 when the river crested at 30.03 feet, we did not close U. S. 59. We do begin to get water over the outside lanes at the intersection of Water Street when the river reaches 29.75 feet. We did close U. S. 59 on June 7, 1987 at the request of the Victoria Police Department when the river crested at 30.45 feet. The roadway was still passable but we were experiencing some traffic problems.

Thank you for the opportunity to comment on this document.

Sincerely,

Kenneth C. Bohuslav, P. E.
TRACS Coordinator



TEXAS STATE SOIL AND WATER CONSERVATION BOARD

311 North 5th
P.O. Box 658
Temple, Texas 76503-0658
(817) 773-2250
Fax (817) 773-3311
September 21, 1992

T. C. Adams, State Single Point of Contact
Governor's Office of Budget and Planning
P. O. Box 12428
Austin, TX 78711

RE: SAI/EIS #: TX-R-92-08-12-0002-50-00

Dear Mr. Adams:

We have reviewed a copy of the Guadalupe River at Victoria Texas Detailed Project Report, Section 205 Small Flood Control Project Main Report and Environmental Assessment. We coordinated our review with the Victoria Soil and Water Conservation District and offer the following comments.

Thank you for the opportunity to review and comment on this document.

Sincerely,

A handwritten signature in cursive script that reads "James M. Moore".

James M. Moore
Engineer

JMM/dm
enclosure

RECEIVED

SEP 21 1992

TEXAS STATE SOIL AND
WATER CONSERVATION BOARD
— DALLAS, TEXAS —

Victoria Soil & Water Conservation District #346
512 S. Main St. Federal Building Room #302
Victoria, Texas 77901

September 16, 1992

Texas State Soil & Water Conservation Board
P. O. Box 652
Temple, Texas 76719
Attn: Janet Gosser, Planner

Dear Janet Gosser:

The following comments have been prepared by the Victoria Soil & Water Conservation District Directors relating to the Detail Project Report (Victoria Levee) along the Guadalupe River at Victoria, Texas.

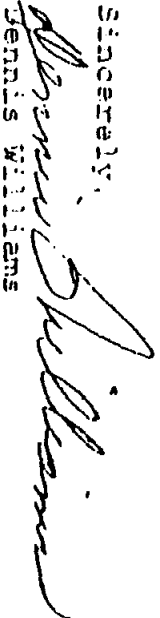
Planning Constraints (part 3 page 20) of Detailed Project Report states that Alternative Plans which resolve problems in one area should not create or increase problems in other areas. However, raising the elevation on the East side would surely compound flood problems for residents in the Green Subdivision and others on the West side of the Guadalupe River as referenced on page 12.

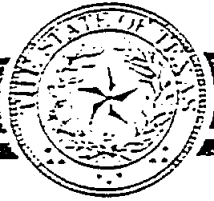
The planning objectives found on page 21 (Item D) make reference to the levee's increased contribution to agricultural productivity but in contrast there is not much cropland nor agricultural land inside of levee.

On page 42 Land, Easements, and Right-of-Way Required makes mention of Borrow Areas under Item B. What are your plans for draining Borrow Areas and to what depth? Otherwise, the Borrow Areas ponding water would create a health problem from mosquitoes and stagnant water.

Our final comment makes reference to differences in acreage shown on page 42 showing a total of 55.8 acres and acreage on page 6 of blue pages showing a total of 61.8 acres for land use.

Sincerely,


Dennis Williams
Chairman



TEXAS WATER DEVELOPMENT BOARD

Charles W. Jenness, *Chairman*
William B. Madden, *Member*
Luis Chavez, *Member*

Craig D. Pedersen,
Executive Administrator

Wesley E. Pittman, *Vice Chairman*
Noc Fernandez, *Member*
Diane E. Umstead, *Member*

September 14, 1992

Mr. Paul M. Boyer, P.E.
City Engineer
City of Victoria
P.O. Box 1758
Victoria, Texas 77902-1758

Dear Mr. Boyer:

Re: Review of the Draft Final Detailed Project Report and Environmental Assessment- TWDB
Contract No. 90-483-777, City of Victoria Flood Protection Planning Study

Staff members of the Texas Water Development Board and the Texas Water Commission have completed a review of the referenced document under TWDB Contract No. 90-483-777 with the City of Victoria. Review comments by the Board and Commission are presented in Attachment 1.

The Board looks forward to receiving twelve copies of the Final Report following any revisions. Please contact Mr. Bob Wear, P. E., the Board's designated Contract Manager, at (512) 463-7987 if you have any questions concerning the Board's comments.

Sincerely,


Tommy Knowles
Director of Planning

cc: ✓ Mr. Robert Van Hook
Galveston District
U.S. Army Corps of Engineers

Enclosure

Attachment 1
Comments on the Draft Final Detailed Project Report
and Environmental Assessment for TWDB Contract No. 90-483-777

The following are review comments of the draft Detailed Project Report and Environmental Assessment for the TWDB Flood Protection Planning Study Contract, No. 90-483-777 with the City of Victoria.

A. Texas Water Development Board Comments:

1. Study recommendations appear to be traditional, feasible means of solving flooding problems.
2. Should the City of Victoria approach the Board for loan assistance to implement the plan, the cost of these improvements are generally eligible for Board financing. In addition, should the City choose to adopt this master plan and approach the Board for any financing, the Board's Water Engineering Section will review the detailed design of specific project elements to make a determination of eligibility.
3. The report does provide sufficient information to support an Environmental Assessment using National Environmental Policy Act (NEPA) guidelines, however, additional consultation with the Texas Parks and Wildlife Department, Environmental Assessment Branch, is recommended.
4. The recently adopted Texas Coastal Management Plan includes Victoria County within its jurisdiction and would, thus, apply to this project.
5. There is no description of mitigative measures which will be applied to borrow areas; for example, sediment runoff controls and revegetation of disturbed areas.
6. In addition to the recommended flood protection plan, strict developmental compliance by the City of Victoria with the National Flood Insurance Act is recommended, particularly with reference to those areas outside of the proposed flood protection area.

B. Texas Water Commission Comments:

1. The technical content of the referenced report is based on acceptable hydrological and hydraulic methods and is complete.
2. The report adequately covers the adverse and beneficial effects of the various plans considered. Commission staff concur with the report findings and recommend that the selected plan be implemented.



PCFF
PL-12

TEXAS
PARKS AND WILDLIFE DEPARTMENT

4200 Smith School Road • Austin, Texas 78744 • 512-389-4800

ANDREW SANSON
Executive Director

COMMISSIONERS

IGNACIO D. GARZA
Chairman, Brownsville

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Houston

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Chairman-Emeritus
Fl. Worth

September 14, 1992

Mr. William Fickel, Jr.
Chief, Planning Division
Department of the Army
Galveston District, Corps of Engineers
P.O. Box 1229
Galveston, Texas 77553-1229

Re: Project Review of the U. S. Corps of Engineers Draft of the Detailed
Project Report and Environmental Assessment Concerning the Local Flood
Protection Levee at Victoria, Texas

Dear Mr. Fickel:

This letter is in response to your request for review of the Project Report and Environmental Assessment document prepared to identify the impacts associated with the construction of the flood protection levee referenced above. Texas Parks and Wildlife Department (TPWD) staff have reviewed the document and offer the following comments concerning this project.

We understand the alternative recommended by the Corps to control flooding along the Guadalupe River near Victoria includes construction of new levees which will tie into an existing levee, repair of the existing levee and construction of interior drainage structures. Approximately seven acres of bottomland forest and fifteen acres of bottomland brush habitat will be destroyed in these proposed construction activities.

In addition to the direct effect of vegetation loss, it is anticipated the project will have an effect of moving water past the project area at an increased rate thereby reducing water retention within the bottomland soil and plant community occurring along the river in the project area. This could potentially impact the character of the bottomland forest community existing in the project area and increase water supply to riverine and estuarine communities downstream including TPWD's Guadalupe Delta Wildlife Management Area.

For this waterway system to maintain its natural function, there must be an allowance for periodic changes in flow regimes and restoration of native floodplain forests.

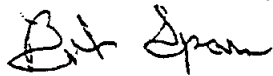
Mitigation for the project should include compensation or habitat replacement of the habitat resources anticipated to be lost.

Mr. William Fickel, Jr.
Page 2

A search of the Texas Natural Heritage Program Information System revealed special species in the general vicinity of Victoria. These data are included as an attachment entitled "Texas Natural Heritage Information."

We appreciate the opportunity to review and comment on the project.

Sincerely,



Robert W. (Bob) Spain, Chief
Habitat Assessment Branch
Resource Protection Division

RWS:JB:dab

Attachments

Texas Natural Heritage Information

A search of the Texas Natural Heritage Program Information System revealed special species in the general vicinity of Victoria. Printouts for nearby records and a code key are attached.

Federal and State Endangered--

Haliaeetus leucocephalus (Bald Eagle) G3 S2 - known to nest along Guadalupe River; contact Mark Mitchell, TPWD biologist at (512)874-4401 or write P.O. Box 41, Lolita, Texas 77971 for current information on eagle localities

Tympanuchus cupido attwateri (Attwater's Prairie-chicken) G4T1 S1 - records from northwest to northeast of Victoria; endemic; open prairies of mostly thick grass one to three feet tall; from near sea level to 200 feet along coastal plain on upper two-thirds of Texas coast; only grouse which lives under near salt-marsh conditions; males form communal display flocks during late winter-early spring; booming grounds important; breeding February-July

Bird Rookeries--

#609-002, Schatz Colony, active 1990 with breeding pairs of Cattle Egrets

The American Alligator is no longer listed as endangered or threatened by the state or federal government. However, it is currently considered by the U.S. Fish and Wildlife Service as "threatened for similarity of appearance" to the American Crocodile. Contact the U.S. Fish and Wildlife Service to obtain the most recent publication of "Endangered and Threatened Wildlife and Plants (50CFR 17.11 & 17.12)" to assist in your project reviews. The most recent printing is July 15, 1991; however, five additional species occurring in Texas have since been listed.

The Heritage Program information included here is based on the best data currently available to the state regarding threatened, endangered, or otherwise sensitive species. However, these data do not provide a definite statement as to the presence or absence of special species or natural communities within your project area, nor can these data substitute for an on-site evaluation by qualified biologists. This information is intended to assist you in avoiding harm to species that occur on your site. Please contact the Texas Parks and Wildlife Department's Heritage Program before publishing or otherwise disseminating any specific locality information.

TEXAS NATURAL HERITAGE PROGRAM
TEXAS PARKS AND WILDLIFE DEPARTMENT
24 AUG 1992

NAME: HALIAEETUS LEUCOCEPHALUS

COMMON NAME: BALD EAGLE

OTHER NAME:

FEDERAL STATUS: LE

STATE STATUS: E

GLOBAL RANK: G3

STATE RANK: S2

IDENTIFIED: Y

TRACK: Y

SENSITIVITY: Y

COUNTY: Victoria

USGS TOPO MAPS:

RAISIN

TOPO QUAD:

2809761

MARGIN #:

3

ELEMENT OCCURRENCE NUMBER: 005

DATE LAST OBSERVED: 1985-03

PRECISION: G

DATE FIRST OBSERVED: 1982

OCCURRENCE RANK: A

DATE SURVEYED: 1986-03

SURVEY COMMENTS: RECENT ACTIVITY

MANAGED AREAS:

CONTAINED:

DIRECTIONS:

NEAR COLETO CREEK AND GUADALUPE RIVER, VICTORIA COUNTY

DESCRIPTION:

RIPARIAN FOREST ON MEDIUM-SIZED RIVER

QUALITATIVE/QUANTITATIVE DATA:

ACTIVE NEST SITE, FOUR YEARS OF OBSERVED OCCUPATION

MANAGEMENT COMMENTS:

PROTECTION COMMENTS:

OTHER COMMENTS:

CONTACT MONITOR FOR SPECIFIC INFORMATION

SOURCE OF INFORMATION:

MABIE, DAVID J. NO DATE. TPWD, 715 SOUTH BRONTE, ROCKPORT, TEXAS
78382.

TEXAS NATURAL HERITAGE PROGRAM
TEXAS PARKS AND WILDLIFE DEPARTMENT
24 AUG 1992

LE: HALIAEETUS LEUCOCEPHALUS

COMMON NAME: BALD EAGLE

OTHER NAME:

FEDERAL STATUS: LE

STATE STATUS: E

GLOBAL RANK: G3

STATE RANK: S2

IDENTIFIED: Y TRACK: Y

SENSITIVITY: Y

COUNTY: Victoria

USGS TOPO MAPS:
BLOOMINGTON SW
BLOOMINGTON

TOPO QUAD: MARGIN #:
2809658 1
2809668

ELEMENT OCCURRENCE NUMBER: 006

DATE LAST OBSERVED: 1985-03

PRECISION: G

DATE FIRST OBSERVED: 1981

OCCURRENCE RANK: A

DATE SURVEYED: 1986-03

SURVEY COMMENTS: RECENT ACTIVITY

MANAGED AREAS:

CONTAINED:

DIRECTIONS:

LINN LAKE, VICTORIA COUNTY

DESCRIPTION:

A SHALLOW LAKE SURROUNDED BY RIPARIAN FOREST

QUALITATIVE/QUANTITATIVE DATA:

ACTIVE NEST SITE

MANAGEMENT COMMENTS:

PROTECTION COMMENTS:

SENSITIVE LOCATION INFORMATION

OTHER COMMENTS:

CONTACT MONITOR FOR SPECIFIC INFORMATION

SOURCE OF INFORMATION:

MABIE, DAVID J. NO DATE. TPWD, 715 SOUTH BRONTE, ROCKPORT, TEXAS
78382.

TEXAS NATURAL HERITAGE PROGRAM
TEXAS PARKS AND WILDLIFE DEPARTMENT
24 AUG 1992

NAME: TYMPANUCHUS CUPIDO ATTWATERI
COMMON NAME: ATTWATER'S PRAIRIE-CHICKEN
OTHER NAME:

FEDERAL STATUS: LE STATE STATUS: E
GLOBAL RANK: G4T1 STATE RANK: S1
IDENTIFIED: Y TRACK: Y SENSITIVITY: N
COUNTY: Victoria

USGS TOPO MAPS: TOPO QUAD: MARGIN #:
INEZ NW 2809688 1

ELEMENT OCCURRENCE NUMBER: 024 DATE LAST OBSERVED: 1985-SPRNG
PRECISION: S DATE FIRST OBSERVED:
OCCURRENCE RANK: C DATE SURVEYED: 1985-SPRNG
SURVEY COMMENTS: LOW NUMBERS

MANAGED AREAS: CONTAINED:

DIRECTIONS:
NEAR VOR STATION (AVIATION NAVIGATION AID) NORTH NORTHWEST OF VICTORIA
REGIONAL AIRPORT

DESCRIPTION:
COASTAL PRAIRIE, NOW PASTURE AND FIELDS

QUALITATIVE/QUANTITATIVE DATA:
16 MALE CHICKENS SEEN ON AERIAL AND GROUND SURVEYS MADE DURING
SPRING BOOMING SEASON

MANAGEMENT COMMENTS:

PROTECTION COMMENTS:
ADEQUATE LEGAL PROTECTION

OTHER COMMENTS:
SMALL POPULATION INDICATED IN AREA

SOURCE OF INFORMATION:
USF&WS. 1985. UNPUBLISHED MAPS OF 1985 PRAIRIE CHICKEN SURVEY
RESULTS. 8 PP.

TEXAS NATURAL HERITAGE PROGRAM
TEXAS PARKS AND WILDLIFE DEPARTMENT
24 AUG 1992

_: TYMPANUCHUS CUPIDO ATTWATERI
COMMON NAME: ATTWATER'S PRAIRIE-CHICKEN
OTHER NAME:

FEDERAL STATUS: LE STATE STATUS: E
GLOBAL RANK: G4T1 STATE RANK: S1
IDENTIFIED: Y TRACK: Y SENSITIVITY: N
COUNTY: Victoria

USGS TOPO MAPS: TOPO QUAD: MARGIN #:
NURSERY 2809781 1

ELEMENT OCCURRENCE NUMBER: 025 DATE LAST OBSERVED: 1985-SPRNG
PRECISION: M DATE FIRST OBSERVED:
OCCURRENCE RANK: C DATE SURVEYED: 1985-SPRNG
SURVEY COMMENTS: LOW NUMBERS, MARGINAL HABITAT

MANAGED AREAS: CONTAINED:

RECTIONS:

AN AREA ABOUT 2 MILES WIDE EXTENDING ABOUT 3 MILES NORTH NORTHWEST AND
4 MILES SOUTH SOUTHEAST OF ABANDONED AIRFIELD NORTH OF VICTORIA

SCRIPTION:

COASTAL PRAIRIE, PASTURES

ALITATIVE/QUANTITATIVE DATA:

31 MALE CHICKENS SEEN ON AERIAL AND GROUND SURVEYS MADE DURING SPRING
BOOMING SEASON

MANAGEMENT COMMENTS:

ROTECTION COMMENTS:

ADEQUATE LEGAL PROTECTION

HER COMMENTS:

SMALL POPULATION INDICATED IN AREA, POOR SITE

SOURCE OF INFORMATION:

USF&WS. 1985. UNPUBLISHED MAPS OF 1985 PRAIRIE CHICKEN SURVEY
RESULTS. 8 PP.

TEXAS NATURAL HERITAGE PROGRAM
TEXAS PARKS AND WILDLIFE DEPARTMENT
24 AUG 1992

NAME: ROOKERY

COMMON NAME:

OTHER NAME: COLONY NUMBER 609-002, SCHATZ COLONY

FEDERAL STATUS: STATE STATUS:

GLOBAL RANK: STATE RANK:

IDENTIFIED: Y TRACK: Y SENSITIVITY:

COUNTY: Victoria

USGS TOPO MAPS:

VICTORIA WEST

TOPO QUAD:

2809771

MARGIN #:

1

ELEMENT OCCURRENCE NUMBER: 554

DATE LAST OBSERVED: 1990

PRECISION: S

DATE FIRST OBSERVED: 1989

OCCURRENCE RANK:

DATE SURVEYED:

SURVEY COMMENTS:

MANAGED AREAS:

CONTAINED:

DIRECTIONS:

SAXET LAKES NORTH OF HWY 59/77, JUST WEST OF VICTORIA

DESCRIPTION:

QUALITATIVE/QUANTITATIVE DATA:

NESTING COLONY OF CATTLE EGRET

MANAGEMENT COMMENTS:

PROTECTION COMMENTS:

OTHER COMMENTS:

COLONY NUMBER 609-002

SOURCE OF INFORMATION:

TEXAS COLONIAL WATERBIRD SOCIETY AND TPWD. 1990. SPECIAL
ADMINISTRATIVE REPORT, TCW ANNUAL CENSUS SUMMARY.

CODE KEY

FEDERAL STATUS

- LE - Listed Endangered
- LT - Listed Threatened
- LELT - Listed Endangered in part of range, Threatened in a different part
- PE - Proposed to be listed Endangered
- PT - Proposed to be listed Threatened
- S - Synonyms
- C1 - Candidate, Category 1. USFWS has substantial information on biological vulnerability and threats to support proposing to list as endangered or threatened. Data are being gathered on habitat needs and/or critical habitat designations.
- C1* - C1, but lacking known occurrences
- C1** - C1, but lacking known occurrences, except in captivity/cultivation
- C2 - Candidate, Category 2. Information indicates that proposing to list as endangered or threatened is possibly appropriate, but substantial data on biological vulnerability and threats are not currently known to support immediate preparation of rules. Further biological research and field study is necessary to ascertain status and/or taxonomic validity.
- C2* - C2, but lacking known occurrences
- C2** - C2, but lacking known occurrences, except in captivity/cultivation
- 3 - Taxa no longer being considered for listing as threatened or endangered. Three subcategories indicate the reasons for removal from consideration.
- 3A - Former Candidate, rejected because presumed extinct and/or habitats destroyed
- 3B - Former Candidate, rejected because not a recognized taxon; i.e. synonym or hybrid
- 3C - Former Candidate, rejected because more common, widespread, or adequately protected

STATE STATUS

- E - Listed as Endangered in the State of Texas
- T - Listed as Threatened in the State of Texas

GLOBAL RANK

- G1 - Critically imperiled globally, extremely rare, 5 or fewer occurrences. [Critically endangered throughout range.]
- G2 - Imperiled globally, very rare, 6 to 20 occurrences. [Endangered throughout range.]
- G3 - Very rare and local throughout range or found locally in restricted range, 21 to 100 occurrences. [Threatened throughout range.]
- G4 - Apparently secure globally.
- G5 - Demonstrably secure globally.
- G#NA - Accidental in North America, now G#NA.
- G#NE - An exotic species established in North America, now G#NE.
- GH - Of historical occurrence through its range.

G#T# - "G"= species rank; "T"= rank of variety or subspecies taxa.
GU - Uncertain; most likely rank/uncertain (G2?), range (G1G2)
GX - Believed to be extinct throughout range.
Q - Qualifier denoting questionable taxonomic assignment.
? - Not ranked to date; or, Qualifier denoting uncertain rank.
C - Captive population exists.

STATE RANK

S1 - Critically imperiled in state, extremely rare, very vulnerable to extirpation, 5 or fewer occurrences.
S2 - Imperiled in state, very rare, vulnerable to extirpation, 6 to 20 occurrences.
S3 - Rare in state, 20+ occurrences.
S4 - Apparently secure in state.
S5 - Demonstrably secure in state.
SA - Accidental in state.
SE - An exotic species established in state.
SH - Of historical occurrence in state. May be rediscovered.
SN - Regularly occurring, usually migratory and typically non-breeding status.
SR - Reported, but without persuasive documentation.
SRF - Reported in error, but error persists in literature.
SU - Possibly in peril in state, but status uncertain.
SX - Apparently extirpated from State.
? - Not ranked to date; or, Qualifier denoting uncertain rank.
C - Captive population exists.

PRECISION

S or SC - Occurrence mapped to seconds of latitude/longitude. SC indicates element occurrence is a confirmed occurrence.
M - Occurrence mapped to minutes of latitude/longitude, approximately 2 km or 1.5 mi radius.
G - Occurrence mapped general to quad or place name precision only, precision within about 8 km or 5 mi radius.
U - Unmappable record.

OCCURRENCE RANK

A - Excellent
B - Good
C - Marginal
D - Poor
X - Destroyed
H - Historical
O - Obscure
E - Extant
I - Introduced

MANAGED AREA - CONTAINED (code following managed area name)

Y - Element occurrence contained within managed area boundaries.
N - Element occurrence partially contained within managed area.
? - Not known if element occurrence is wholly contained or not.

BUREAU OF ECONOMIC GEOLOGY
THE UNIVERSITY OF TEXAS AT AUSTIN

University Station, Box X, Austin, Texas 78713-7508 (512) 471-1534 or 471-7721 FAX 471-0140
10100 Burnet Road, Austin, Texas 78758-4497

August 28, 19912

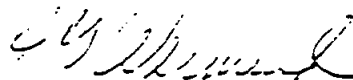
SAI/EIS# TX-R-92-08-12-0002-50-00

Mr. T. C. Adams
Governor's Office of Budget and Planning
P.O. Box 12428
Austin, TX 78711

Dear Tom:

The Bureau of Economic Geology has reviewed the referenced proposal on the proposed Victoria Levee at Victoria, Texas, presented by the U.S. Army Corps of Engineers. The Bureau has no adverse comments. We suggest that the results of the unique-wet 1992, flood year be accounted in project design and implementation.

Sincerely,



E. G. Wermund
Research Scientist

EGW:lch

FINDING OF NO SIGNIFICANT IMPACT
FOR THE
GUADALUPE RIVER at VICTORIA, TEXAS

Section 205 - Small Flood Control Project

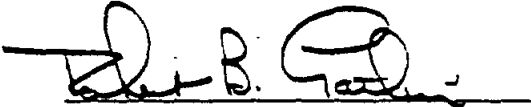
As District Engineer, Galveston District, U.S. Army Corps of Engineers, it is my responsibility to prepare findings based on an Environmental Assessment (EA) concerning local flood protection on the Guadalupe River at Victoria, Texas. The proposed project will provide the FEMA 100-year frequency level of protection to the City of Victoria from flooding of the Guadalupe River and generally includes rehabilitation of the existing levee and extending it both upstream and downstream.

The Galveston District has taken every reasonable measure to evaluate the environmental impacts of the proposed project. These impacts are addressed in the EA. Based on information presented in the EA and information received from various agencies, it has been determined that the proposed project will have no significant adverse impacts on the environment. The following factors were considered pertinent in this finding of no significant impact:

- a. No degradation of water quality will occur from the proposed project.
- b. No effect on any endangered or threatened species is anticipated from proposed construction.
- c. No impacts to historic resources are anticipated.

Based on these factors and information in the EA, I have determined that preparation of an Environmental Impact Statement is not required. The proposed project is economically sound and environmentally acceptable and should be constructed as proposed.

16 Oct 95
Date


Robert B. Gatlin
Colonel, Corps of Engineers
District Engineer