HARDIN COUNTY WCID NO. 1

FLOOD CONTROL STUDY

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SUMMARY

This study and report presents an evaluation of existing flood hazards within Hardin County WCID No. 1 (Pinewood Estates) and Country Wood Estates immediately south of Pinewood Estates. Alternative plans to alleviate existing flooding problems are presented and evaluated.

The existing flooding problems within Pinewood Estates and Country Wood Estates are due to the following sources of flooding: 1) overbank flooding of Coon Marsh Gully which inundates properties within southern Pinewood Estates and Country Wood Estates and which contributes to flooding in Pinewood Estates further north, 2) overbank flooding of Little Pine Island Bayou which inundates properties in Pinewood Estates, 3) flooding along Clemmons Gully due to backwater from Little Pine Island Bayou which inundates properties in Pinewood Estates, and 4) inadequate internal drainage facilities which result in local flooding of properties in the Woodlawn Drive area of Pinewood Estates.

Five alternatives were investigated in detail to alleviate the existing flooding problems. Alternative 1 consists of the buy-out of all residential structures subject to inundation during the 100-year flood. Alternative 2 consists of the raising of structure foundations to elevate the structures above the 100-year flood level. Alternative 3 consists of channel improvements to Coon Marsh Gully and

Coon Marsh Gully Diversion Ditch, levee and interior drainage improvements along Clemmons Gully (levee located south of Clemmons Gully), and outfall drainage improvements in the Woodlawn Drive area. Alternative 4 consists of channel improvements to Coon Marsh Gully and Coon Marsh Gully Diversion Ditch, as contained in Alternative 3, but excludes other components of Alternative 3. Alternative 5 is identical to Alternative 3 with the exception that the levee is located north of Clemmons Gully and a diversion channel is required just outside the levee to reroute Clemmons Gully.

Estimated capital costs of Alternatives 1, 2, 3, 4, and 5 are $4,020,000, $3,366,000, $3,068,000, $685,000, and $2,580,000, respectively. Estimated annual costs of Alternatives 1, 2, 3, 4, and 5 are $357,000, $299,000, $318,000, $66,000, and $274,000, respectively. Benefit-cost ratios of Alternatives 1, 2, 3, 4, and 5 are 0.92, 1.21, 1.16, 1.37, and 1.35, respectively.

Based on the estimated costs and benefits of alternatives, it is recommended that Alternative 5 be pursued to alleviate flooding problems within Pinewood Estates and Country Wood Estates.

SECTION I

INTRODUCTION

PURPOSE AND SCOPE

The purpose of this study and report is to evaluate flooding and local drainage problems which currently exist within Hardin County WCID No. 1 and to determine improvements required to alleviate such problems.

The specific scope of work of this study, which was conducted in two phases, is as follows:

PHASE 1

a. Meet with the District, the Corps of Engineers, and the Texas Water Development Board for initial coordination on the project.

b. Obtain existing hydrological data from all known sources.

c. Review previous reports concerning flooding on Pine Island Bayou, and review findings of the Corps of Engineers on their flood control study of Pine Island Bayou and Little Pine Island Bayou.

d. Attend a public meeting to explain the study to citizens and obtain citizens input.

e. Provide necessary surveying to obtain cross sections of Clemmons, Goleman, and Coon Marsh gullies, and needed drainage field data within the District's boundaries.

f. Utilizing the aerial photography and horizonal and vertical control data provided by the Corps

of Engineers, prepare a two foot contour map at a scale of 1" = 200 feet of approximately 2,500 acres of the District and its surrounding area.

g. Using the Corps of Engineers' HEC-1 and HEC-2 computer programs, prepare computer models of Clemmons, Goleman, and Coon Marsh gullies, and evaluate existing conditions.

h. Identify various structural and non-structural alternatives to be evaluated.

i. Identify and evaluate internal drainage and flooding problems of the District other than those directly related to Clemmons, Goleman, and Coon Marsh gullies.

j. Identify alternate solutions to these internal problems for further evaluation in Phase 2.

k. Prepare a brief preliminary report of findings and recommendations at the end of Phase 1 and submit to the District, Corps of Engineers, Texas Water Development Board, Lower Neches Valley Authority, Jefferson County Drainage District No. 6, the Big Thicket National Preserve, U.S. Parks and Wildlife, and the Texas Parks and Wildlife Department for their review and comments.

1. Prepare all monthly and quarterly reports and pay vouchers required by the Texas Water Development Board.

PHASE 2

a. Using the Corps of Engineers' HEC-2 program, conduct a hydraulic evaluation of each structural alternative to identify its impact on flood elevations.

b. Conduct a benefit-to-cost analysis of all flood damage abatement measures proposed. Cost estimates will be based on current prices. Cost estimates must include the investment cost (first cost plus interest during construction) and annual cost (interest, amortization, and operation and maintenance). An assessment will be made of flood damage reduction benefits to be expected from implementing the proposed flood abatement alternatives, including non-monetary benefits such as reduction in hazards to human life and safety.

c. Assess the potential environmental effects of implementing any proposed flood damage abatement measures. Structural and non-structural flood damage abatement alternatives will be recommended which are environmentally

compatible with the Big Thicket National Preserve.

d. Evaluate alternate solutions to internal flooding problems within the District.

e. Develop design standards for drainage and flood control improvements and assist the District's attorney in developing ordinances to implement these design standards.

f. Present preliminary findings and recommendations to the District, the Texas Water Development Board, Jefferson County Drainage District No. 6, The Big Thicket National Preserve, the Corps of Engineers, and the Lower Neches Valley Authority for review and comment. Attend meetings as requested by any of these agencies to explain study findings and recommendations.

g. Make revisions as requested.

h. Prepare final report; make 40 copies; and submit final report to the District, the Corps of Engineers, the Texas Water Development Board, Jefferson County Drainage District No. 6, The Big Thicket National Preserve, and the Lower Neches Valley Authority. Attend meeting to present the final report to the District.

i. Prepare all monthly and quarterly reports and pay vouchers required by the Texas Water Development Board.

AUTHORIZATION AND FUNDING

This study was authorized by an agreement between Hardin County WCID No. 1 and KSA Engineers, Inc. dated June 2, 1987.

Primary funding for this study was provided by the Texas Water Development Board. Additional funding was provided by the Galveston District of the U.S. Army Corps of Engineers, the Jefferson County Drainage District No. 6, and Ms. Jeanie Turk, a developer of property within Hardin County WCID No. 1.

COORDINATION

This study was coordinated with several local, state, and federal entities. At the local level, a coordination meeting was held on September 22, 1987 to solicit public input. This meeting was attended by 82 persons including local residents, Hardin County WCID No. 1 board members and staff, Hardin County officials, Texas Water Development staff, U.S. Army Corps of Engineers-Galveston District staff, and KSA Engineers, Inc. staff.

During performance of this study, the following entities were contacted, advised of the study, and pertinent information acquired therefrom:

1. Hardin County WCID No. 1
2. Hardin County
3. Hardin County Appraisal District
4. Jefferson County Drainage District No. 6
5. Lower Neches Valley Authority
6. Texas Water Development Board
7. Texas Department of Highways and Public Transportation
8. U.S. Army Corps of Engineer, Galveston District
9. U.S. Soil Conversation Service
10. Federal Emergency Management Agency
11. Bernard Johnson Incorporated Consulting Engineers
12. Big Thicket National Preserve

PRIOR STUDIES AND REPORTS

Prior studies and reports which were reviewed and utilized where appropriate are as follows.

1. "Jefferson County Drainage District Number Six - Pine Island Bayou Watershed Report", June 1986 by Bernard Johnson Incorporated and Bob Shaw Consulting Engineers.
2. "Pine Island Bayou Watershed, Texas - Flood Damage Prevention - Feasibility Report", June 1985 by U.S. Army Corps of Engineers, Galveston District.

3. "Pine Island Bayou Watershed, Texas - A Planning-Aid Report Submitted to the U.S. Army Corps of Engineers Galveston District Galveston, Texas", September 1981 by Bruce G. Halstead, Fish and Wildlife Biologist, U.S. Fish and Wildlife Service, Division of Ecological Services, Galveston, Texas Field Office.

4. "Flood Insurance Study - Hardin County, Texas (Unincorporated Areas)", March 1978 by U.S. Department of Housing and Urban Development, Federal Insurance Administration.

5. "Neches River and Tributaries, Texas - Reconnaissance Report on Flood Problem at Pinewood Estates Subdivision Hardin County, Texas", October 1976 by U.S. Army Corps of Engineers District, Galveston, Texas.

SECTION II

EXISTING CONDITIONS

DESCRIPTION OF STUDY AREA

The study area is located in southern Hardin County, Texas and consists of the watersheds of Little Pine Island Bayou and its tributary streams of Coon Marsh Gully, Clemmons Gully, and Goleman Gully, as shown on Exhibit 1. The specific stream reaches for which flooding hazards were evaluated are as follows:

1. Little Pine Island Bayou from its mouth at the confluence with Pine Island Bayou to its entrance into Hardin County WCID No. 1, approximately 4.8 miles upstream of its mouth
2. Coon Marsh Gully from its mouth at the confluence with Little Pine Island Bayou to its crossing of State Highway 105, approximately 4.1 miles upstream of its mouth
3. Clemmons Gully from its mouth at the confluence with Little Pine Island Bayou to a point approximately 4.7 miles upstream of its mouth
4. Goleman Gully from its mouth at the confluence with Clemmons Gully to its crossing of State Highway 105, approximately 1.1 miles upstream of its mouth

The study area is located in the East Texas Timberlands Land Resource Area of Southeastern Texas. Climate within the study area is characterized by hot, humid summers and mild, wet winters. Mean monthly temperatures vary from 53°F in January to 82°F in August.

Average annual rainfall within the study area us approximately 53 inches. Intense rainfall is produced by thunderstorms of short duration, general storms which extend over several days, and torrential rainfall associated with hurricanes.

Topography within the study area is relatively flat with ground elevations, excluding stream channels, varying from about elevation 20 feet mean sea level (msl) to about elevation 33 feet msl, as determined from the two-foot contour map developed as part of this study.

Two residential subdivisions comprise the major portion of the study area - Pinewood Estates (Hardin County WCID No. 1) and Country Wood Estates, which is located immediately south of Pinewood Estates and north of State Highway 105. A total of 365 single-family residences are located with these two subdivisions, 290 in Pinewood Estates and 75 in Country Wood Estates. Based on an estimated population density of 3.5 persons per household, the population within the study area is estimated to be 1,278 persons.

HISTORIC FLOODING PROBLEMS

Historic flooding problems within the study area are well-documented and have been studied previously by the U.S. Army Corps of Engineers, Galveston District. House flooding within Pinewood Estates is reported by residents to have occurred in 1963, 1972, 1975, 1979, 1985, 1986, 1987, and

1989. In its 1985 study, the Corps of Engineers estimated a total of 270 structures within Pinewood Estates were located within the floodplain of the Standard Project Flood (SPF), which is defined as the flood that would be produced by the most severe combination of rianfall and runoff conditions that are representative of the area. The SPF is generally considered to be a more severe flood than the 500-year flood.

House flooding within the study area has generally been attributed to: 1) overbank and backwater flooding from Little Pine Island Bayou which has caused house flooding in Pinewood Estates and 2) overbank flooding of Coon Marsh Gully which has caused house flooding in Pinewood Estates and Country Wood Estates.

BIG THICKET NATIONAL PRESERVE

A portion of the Big Thicket National Preserve (BTNP) is located within and downstream of the study area. The Little Pine Island Bayou Corridor Unit of the BTNP consists of Little Pine Island Bayou and portions of its adjacent floodplains from near Saratoga to its confluence with Pine Island Bayou, although no portion of the BTNP is located within Hardin County WCID No. 1. Due to its inclusion in the BTNP, channel improvements to Little Pine Island Bayou downstream of Hardin County WCID No. 1, for the purpose of alleviating house flooding within the study area, are not considered feasible.

SECTION III

STUDY METHODS AND FINDINGS

SITE RECONNAISSANCE AND DATA COLLECTION

The study area was inspected on several occasions by KSA Engineers, Inc. staff engineers. Little Pine Island Bayou, Coon Marsh Gully, Clemmons Gully, and Coleman Gully were inspected to ascertain existing conditions. Locations of house flooding were determined from inspections with Hardin County WCID No. 1 staff and other local residents familiar with the past house flooding problems.

Information was solicited from Pinewood Estates and Country Wood Estates residents regarding past flooding problems. A total of 43 responses were received which documented frequency of flooding and costs for repair of flood damage.

Pine Island Bayou was inspected by boat at the U.S. Highway 69 crossing north of Beaumont. The boat inspection revealed two significant floodplain encroachments immediately upstream of the U.S. Highway 69 bridge: 1) an abandoned railroad embankment and 2) the LNVA canal and pump station. Further upstream a distance of approximately 2.3 miles from the U.S. Highway 69 crossing, another abandoned railroad or tram embankment has found to encroach significantly into the Pine Island Bayou floodplain. While these floodplain encroachments are too far downstream to affect flooding conditions within Hardin County WCID No. 1, they no doubt produce backwater effects which extend some distance upstream of their locations.

Gully which had been acquired during preparation of an updated FEMA Flood Insurance Study of Hardin County. Cross section data was also provided by the U.S. Soil Conservation Service.

The Jefferson County Drainage District No. 6 provided a copy of its 1986 drainage study and report. The Hardin County Appraisal District provided information regarding property appraisals within the study area.

TOPOGRAPHIC MAPPING

A two-foot contour map at a scale of 1 inch = 200 feet was developed during this study from aerial photography by Williams-Stackhouse, Inc. The topographic map covers all of Pinewood Estates and Country Wood Estates and is bound separately as Appendix 10 to this report.

Field surveys were conducted to provide additional topographic data within the study area. A total of 22 cross sections of study streams were field surveyed. In addition, finish floor elevations were obtained for 133 homes in Pinewood Estates and 17 homes in Country Wood Estates. Street culverts within Pinewood Estates and Country Wood Estates were also field surveyed. The house slab and culvert elevations and selected ground and street pavement elevations are shown on the topographic maps of Appendix 10.

HYDROLOGIC ANALYSES

Hydrologic analyses were conducted to establish peak flood discharges of Coon Marsh Gully, and Goleman Gully. Peak flood discharges were computed for 100-year, 50-year, 25-year, 10-year, 5-year, and 2-year floods. The 100-year flood is defined as the flood which has a 1% chance (or 1 in 100) of being exceeded in any given year. Likewise, the 50-year, 25-year, 10-year, 5-year, and 2-year floods have probabilities of 2%, 4%, 10%, 20%, and 50%, respectively, of being exceeded in any given year.

Peak flood discharges were computed using Corps of Engineers computer program HEC-1 with Snyder synthetic unit hydrograph coefficients as developed by the U.S. Army Corps of Engineers, Galveston District (C_t = 4.16 and C_p = 0.45). Rainfall data of U.S. Weather Bureau Technical Paper No. 40 and National Weather Service HYDRO-35 were used in the HEC-1 models.

Table 1 presents peak flood discharges for Little Pine Island Bayou, developed by the Galveston District, and for Coon Marsh, Clemmons, and Goleman gullies. Appendix 1 contains a copy of the HEC-1 computer model of the Coon Marsh Gully 100-year flood. Appendix 2 contains a copy of the HEC-1 computer model of the Clemmons and Goleman gullies 100-year flood.

HYDRAULIC ANALYSES

Hydraulic analyses were conducted for Coon Marsh, Clemmons, and Goleman gullies to provide estimates of flood elevations for the 100-year, 50-year, 25-year, 10-year, 5-year, and 2-year floods. Flood elevations were computed using U.S. Army Corps of Engineers computer program HEC-2. Cross sections of streams were field surveyed as previously described. Roughness values (Manning's "n") were estimated to be 0.05 for channels, 0.12 for wooded overbanks, and 0.04 for cleared overbanks. Starting water surface elevations for HEC-2 models of Coon Marsh, Clemmons, and Goleman gullies were based on normal depth.

Results of computed flood profiles for Coon Marsh, Clemmons, and Goleman gullies are shown on Exhibits 2,3, and 4, respectively.

Backwater effects of receiving streams are also shown on the flood profiles. Little Pine Island Bayou backwater is shown in the lower reaches of Coon Marsh Gully and Clemmons Gully. Likewise, Clemmons Gully backwater is shown on the Goleman Gully profile.

Backwater effects of Little Pine Island Bayou on Coon Marsh Gully are based on water surface profiles of Little Pine Island Bayou contained in the previously referenced June 1985 report by the Corps of Engineers. Backwater effects of Little Pine Island Bayou on Clemmons Gully are based on revision of the Corps of Engineers HEC-2 model of Little Pine Island Bayou

to include cross sections of Little Pine Island Bayou (within Pinewood Estates) obtained during this study.

COON MARSH GULLY

As shown on Exhibit 2, backwater effects of Little Pine Island Bayou on Coon Marsh Gully end approximately 6,000 feet upstream from the mouth of Coon Marsh Gully and approximately 8,000 feet downstream of Pinewood Estates. Thus, flooding problems along Coon Marsh Gully within Pinewood Estates and Country Wood Estates are due to flood flows exceeding the capacity of the Coon Marsh Gully channel and overbanks and not to backwater effects of Little Pine Island Bayou. Flood profiles of Coon Marsh Gully were computed with varying starting water surface elevations which confirmed that the two subdivisions are well upstream of backwater effects of Little Pine Island Bayou.

Significant flood flows of Coon Marsh Gully are diverted via overland flow north into Pinewood Estates in the Clemmons Gully watershed. These diversions occur at locations upstream of the Pinewood Blvd. crossing of Coon Marsh Gully where floodwaters rise above the natural topographic divide between Coon Marsh Gully and Clemmons Gully. Such diversions are known to occur near the west end of Pinemont Drive and further east in the vicinity of the intersection of Pinemont Drive and Pineglen Drive. Diversions at the latter location are the more significant and were analyzed using: 1) the HEC-2 model

of Coon Marsh Gully to establish the stage-discharge relation of Coon Marsh Gully at the diversion location and 2) weir flow calculations to establish the stage-discharge relation of the overflow section of Pinemont Drive. Based on this analysis, flood flows exceeding the 2-year flood are expected to produce overflow north into Pinewood Estates. Overflows are estimated to vary from 780 cfs during the 100-year flood to 70 cfs during the 5-year flood. Such overflows represent 71% of the 100-year peak flood discharge of 1100 cfs and 17% of the 5-year flood peak flood discharge of 420 cfs. Several houses along Pinemont Drive have experienced house flooding as a result of these overflows.

The existing Coon Marsh Gully Diversion Ditch was analyzed to estimate its discharge capacity. Using field surveyed cross sections and computer program HEC-2, flood profiles of the diversion ditch were computed to estimate the flow split which occurs between the diversion ditch and the downstream Coon Marsh Gully channel. The capacity of the existing diversion ditch was computed to vary from 240 cfs during the 100-year flood to 180 cfs during the 2-year flood. Such capacity represents 22% of the 100-year peak flood discharge of 1,100 cfs and 78% of the 10-year peak flood discharge of 230 cfs. Reduction of Coon Marsh Gully flood levels through Pinewood Estates and Country Wood Estates could therefore be achieved by increasing the capacity of the diversion ditch.

Appendix 3 contains a copy of the HEC-2 computer model of Coon Marsh Gully.

Table 2 presents information regarding houses within Pinewood Estates and Country Wood Estates which are subject to flooding by Coon Marsh Gully. Of 36 field surveyed houses along Coon Marsh Gully, 15 are subject to flooding by the 100-year flood.

CLEMMONS GULLY

As shown on Exhibit 3, backwater effects of Little Pine Island Bayou extend upstream of the Pine Shadows Drive crossing of Clemmons Gully (at the west boundary of Hardin County WCID No. 1) for the 100-year and 50-year floods. Backwater effects of Little Pine Island Bayou for the 25-year and 10-year floods extend to within approximately 1,000 feet of the Pine Shadows Drive crossing. Thus, the primary source of the flooding along Clemmons Gully within Pinewood Estates is due to backwater effects of Little Pine Island Bayou and not to overbank flooding caused by Clemmons Gully flood flows. Overflows from Coon Marsh Gully contribute to house flooding in the section of Pinewood Estates between Coon Marsh Gully and Clemmons Gully, as previously discussed. Overbank flooding along the main channel of Little Pine Island Bayou also causes house flooding in Pinewood Estates, although this source of flooding does not affect as many houses as does backwater flooding along Clemmons Gully.

Table 3 presents data regarding houses within Pinewood Estates subject to flooding by Little Pine Island Bayou. As shown in Table 3, 36 houses within Pinewood Estates are subject to flooding by the 100-year flood of Little Pine Island Bayou.

Since channel improvements of Little Pine Island Bayou downstream of Pinewood Estates are not considered feasible, due to its inclusion in the BTNP, the means of protecting flood prone houses within Pinewood Estates from backwater flooding of Little Pine Island Bayou is limited to construction of a levee, raising the existing houses, or some other technique to protect houses from Little Pine Island Bayou backwater flooding.

The clearing and snagging of Little Pine Island Bayou through and downstream of Pinewood Estates, as accomplished in previous years, is effective in the control of undergrowth and log jams which increase flood levels along Little Pine Island Bayou. However, significant lowering of flood levels of Little Pine Island Bayou would require clearing and snagging a considerable distance downstream of Pinewood Estates. Based on the Corps of Engineers HEC-2 model of Little Pine Island Bayou, clearing and snagging of a 50-feet wide strip in each overbank along the channel in the 4-mile reach of Little Pine Island Bayou below Pinewood Estates would reduce the 100-year flood level at Pinewood Estates by approximately 0.3 feet.

Appendix 4 contains a copy of the HEC-2 computer model of Clemmons Gully.

GOLEMAN GULLY

As shown on Exhibit 4, backwater effects of Clemmons Gully extend nearly the full length of the reach of Goleman Gully studied herein. Goleman Gully is not considered to be a source of house flooding in either Pinewood Estates or Country Wood Estates.

Appendix 5 contains a copy of the HEC-2 computer model of Goleman Gully.

INTERNAL DRAINAGE PROBLEMS

In addition to evaluating the flood hazards of Coon Marsh, Clemmons, and Goleman gullies, the internal drainage system of roadside ditches and culverts was examined to determine if hydraulic inadequacies exist. An obvious deficiency in the internal drainage system is the lack of adequate culvert hydraulic capacity under Pinewood Blvd. at State Highway 105. The existing dual 24-inch diameter culverts receive flow from three 5-feet by 2-feet box culverts under State Highway 105 (drainage area of approximately 260 acres) as well as additional flow from approximately 120 acres in Country Wood Estates. The backwater effect created by the culvert at Pinewood Blvd. results in diversion of flows, which should be conveyed east to Clay Gully, to the north to Coon

Marsh Gully thus aggravating the flooding problems along Coon Marsh Gully in Pinewood Estates and Country Wood Estates. The hydraulic capacity of the box culverts under State Highway 105 is adequate for a 10 to 25-year flood. Provision of similar capacity at Pinewood Blvd. will require three 5-feet by 3-feet box culverts. The State Department of Highways and Public Transportation should be informed of the needed culvert replacement and requested to perform the replacement.

Another area in need of internal drainage improvements is the Woodlawn Drive area of north Pinewood Estates. Inadequate internal drainage is considered responsible for flooding in this area based on reports of flowing water (rather than rising backwater from Little Pine Island Bayou) being the source of flooding. Inspection of the internal drainage system revealed the lack of adequate site drainage ditches and culvert capacity to convey local runoff from intense rainfalls. Two houses along Woodlawn Drive are below the computed 100-year flood level of Little Pine Island Bayou.

Several areas of nuisance flooding (yards, driveways, etc. but not house flooding) were identified, primarily in Pinewood Estates north of Coon Marsh Gully and south of Clemmons Gully. Such nuisance flooding is aggravated by Coon Marsh Gully overflows.

TABLE 1

PEAK FLOOD DISCHARGES

Stream and Location	Drainage Area, square miles	Peak Flood Discharge, cfs					
		100-year	50-year	25-year	10-year	5-year	2-Year
LITTLE PINE ISLAND BAYOU AT WOODWAY BOULEVARD	approx. 125	12,800	10,600	8,370	5,670	3,950	2,140
COON MARSH GULLY							
at mouth	4.47	2,650 (1720)	2,320 (1530)	1,890 (1310)	1,360 (980)	1010 (770)	560 (410)
above confluence with Clay Gully	2.16	1,340 (340)	1,170 (330)	960 (320)	690 (280)	510 (250)	280 (110)
above confluence with Diversion Ditch	1.75	1,100 (320)	960 (320)	790 (350)	560 (360)	420 (350)	230 (230)
midway thru Country Wood Estates	1.30	870	760	630	450	340	190
at State Highway 105	0.85	630	560	470	340	250	140
CLEMMONS GULLY							
at mouth	20.00	4,740	4,000	3,180	2,260	1,650	860
above confluence with Goleman Gully	17.12	3,970	3,350	2,650	1,890	1,380	730
GOLEMAN GULLY							
at mouth	1.70	900	780	640	460	340	190
at State Highway 105	1.29	630	550	440	320	240	130

Note: Coon Marsh Gully peak flood discharges adjusted for overflows and diversions are shown in parentheses.

TABLE 2

NUMBER OF HOUSES SUBJECT TO FLOODING BY COON MARSH GULLY

Flood Exceedance Frequency	Number of Houses Subject to Flooding		
	Pinewood Estates [1]	Country Wood Estates [2]	Total
100-Year	6	9	15
50-Year	6	8	14
25-Year	6	5	11
10-Year	6	4	10
5-Year	5	4	9
2-Year	0	2	2

[1]Based on 19 field surveyed house slab elevations south of Pinemont Drive.

[2]Based on 17 field surveyed house slab elevations.

TABLE 3

NUMBER OF HOUSES SUBJECT TO FLOODING BY LITTLE PINE ISLAND BAYOU

Flood Exceedance Frequency	Number of Houses Subject to Flooding		
	Backwater Flooding Along Clemmons Gully	Flooding Along Little Pine Island Bayou	Total
100-Year	30	6	36
50-Year	16	1	17
25-Year	7	0	7
10-Year	0	0	0

SECTION IV

EVALUATION OF ALTERNATIVES

GENERAL

As discussed in Section III of this report, flooding problems within Hardin County WCID No. 1 (Pinewood Estates) and Country Wood Estates result from the following sources of flooding:

1. Coon Marsh Gully overbank flooding which floods houses in south Pinewood Estates and Country Wood Estates and which contributes to flooding in Pinewood Estates between Coon Marsh Gully and Clemmons Gully
2. overbank flooding along the main channel of Little Pine Island Bayou through Pinewood Estates
3. Little Pine Island Bayou backwater flooding along Clemmons Gully in Pinewood Estates
4. local flooding in the Woodlawn Drive area of Pinewood Estates due to inadequate internal drainage facilities

Alternatives investigated to alleviate house flooding problems are as follows:

Alternative 1 - buy-out of floodprone properties

Alternative 2 - raising the house slabs of all floodprone properties with concrete piers

Alternative 3 - constructing a system of channel and levee improvements (levee south of Clemmons Gully) which form a combined

plan for alleviating flooding problems along Coon Marsh Gully, Clemmons Gully, and in the Woodlawn Drive area

Alternative 4 - constructing channel improvements to alleviate flooding problems along Coon Marsh Gully (without levee improvements along Clemmons Gully)

Alternative 5 - constructing a system of channel and levee improvements (levee north of Clemmons Gully) which form a combined plan for alleviating flooding problems along Coon Marsh Gully, Clemmons Gully, and in the Woodlawn Drive area

ALTERNATIVE 1 - BUY-OUT FLOODPRONE PROPERTIES

Alternative 1 consists of the purchase of all residences identified as being subject to inundation by the 100-year flood. A total of 42 homes within Pinewood Estates have been found to have first floor slab elevations computed below computed 100-year flood levels. Also, 9 homes in Country Wood Estates have slab elevations below computed 100-year flood levels.

Appraised values of residences within Pinewood Estates and Country Wood Estates were obtained from the Hardin County

Appraisal District. The total appraised value of the 51 houses subject to flooding during the 100-year flood is $3,495,870, of which $2,593,980 is within Pinewood Estates and $901,890 is within Country Wood Estates. Allowing 15% for acquisition and other expenses, the total estimated capital cost of this alternative is $4,020,000.

ALTERNATIVE 2 - RAISE FLOODPRONE STRUCTURES

Alternative 2 consists of the raising of foundation slabs of floodprone structures. Although somewhat unconventional, this alternative has been successfully employed for floodprone residences. This alternative requires drilling concrete piers beneath perimeter and interior grade beams and at intermediate locations as required and raising the structure with hydraulic jacks.

Based on discussions with contractors engaged in such foundation modifications, the estimated cost to raise the typical house foundation in Pinewood Estates and Country Wood Estates is $66,000. The estimated capital cost of this alternative to raise foundations of 51 floodprone structures is therefore $3,366,000.

ALTERNATIVE 3 - CHANNEL AND LEVEE IMPROVEMENTS (levee south of Clemmons Gully)

Alternative 3 consists of: 1) constructing channel improvements to Coon Marsh Gully and Coon Marsh Gully

Diversion Ditch to reduce house flooding which occurs during the computed 100-year flood and to prevent overflows from Coon Marsh Gully into Pinewood Estates, 2) constructing an earthen levee along the south bank of Clemmons Gully and associated interior drainage works to prevent 100-year backwater flooding from Little Pine Island Bayou, and 3) constructing internal drainage facilities with capacity to remove local 100-year flows without resultant house flooding in the Woodlawn Drive area.

As previously discussed, Coon Marsh Gully Diversion Ditch provides limited capacity to relieve Coon Marsh flood flows. Alternative channel improvements to the diversion ditch were evaluated using HEC-2 computer models. A channel of 30-feet bottom with side slopes of 3 horizontal:1 vertical will convey the 100-year peak flood discharge of Coon Marsh Gully at flood elevations approximately 1.5 feet lower (without occurrence of overflows north through Pinewood Estates) than under existing conditions. Based on the field survey data of existing house slabs, the number of houses subject to flooding during passage of the 100-year flow would be reduced from 15 to 2. These channel improvements would extend from the mouth of Coon Marsh Gully Diversion Ditch to the State Highway 105 crossing of Coon Marsh Gully, a distance of approximately 2.5 miles, as shown on Exhibits 2 and 5. It is recommended that the channel improvements extend to State Highway 105 in order to relieve overbank flooding upstream of Bonura Road North

which results in overflows to Pinewood Estates. The State Department of Highways and Public Transportation has a drainage easement along Coon Marsh Gully from State Highway 105 north through Country Wood Estates and Pinewood Estates and should be contacted regarding possible participation in Coon Marsh Gully channel improvements.

To prevent 100-year backwater flooding from Little Pine Island Bayou, Alternative 3 includes an earthen levee to be constructed along the south bank of Clemmons Gully from high ground at the west boundary of Pinewood Estates to high ground near the golf course clubhouse, a distance of 7,650 feet. The location of the levee is shown on Exhibit 5 and on Sheets 3 of 4 of Appendix 10. The levee will protect 30 homes along Pine Shadows Drive which are subject to 100-year backwater flooding from Little Pine Island Bayou. The top-of-levee elevation is 31.0 feet msl which is 1.7 feet above the 100-year flood level of Little Pine Island Bayou.

Exhibit 6 presents a profile of the earthen levee, and Exhibit 7 presents a typical section of the levee. As shown on Sheets 3 and 4 of Appendix 10, the levee is located near the south bank of Clemmons Gully on property owned by Pinewood Country Club. Significant modifications of the golf course are required by this location of the levee. The levee location is based on the floodway boundary recently computed during an updated FEMA flood insurance study of Hardin County. Since the levee is located just outside of the regulatory

floodway, 100-year flood elevations resulting from Clemmons Gully flood flows will be increased less than one foot upstream of Pinewood Estates. Based on the HEC-2 model of Clemmons Gully utilized in this study, the levee is estimated to produce a maximum rise of 0.4 feet in the Clemmons Gully 100-year flood profile. This increase diminishes to no rise at a distance of approximately 3 miles upstream of Pinewood Estates.

As an alternative to the earthen levee, a reinforced concrete wall with earthen embankment on one side of the wall was investigated. This alternative would require right-of-way width of approximately 50% of the right-of-way width of 100 feet to 130 feet required for the earthen levee. The concrete wall alternative is estimated to be roughly double the cost of an earthen levee and is therefore not considered preferable to the earthen levee.

A stormwater pump station is required to remove rainfall runoff generated within the leveed area. Based on a HEC-1 model of 100-year runoff with flood routing through existing storage available on the golf course property, a stormwater pump station with three 50,000 gallons per minute pumps is required. The pumps are sized to remove 100-year interior runoff with ponding levels below elevation 26.0 feet msl which is slightly below the lowest house slab elevation of houses within the levee. Three pumps are recommended to insure two pumps operational at all times. The pumps would be driven by

diesel engines with start-up and shut-down automated by water level of the ponding area.

A gravity outlet consisting of a 72-inch diameter RCP conduit equipped with flap and slide gates would be located at the pump station site. The gravity outlet will allow removal of interior runoff by gravity flow when the water level in Clemmons Gully is less than the water level within the leveed area.

Prevention of 100-year house flooding in the Woodlawn Drive area will require construction of drainage ditches and culverts capable of passing 100-year flows at elevations below existing house slabs. These improvements would convey runoff south to Little Pine Island Bayou.

The locations of improvements required by Alternative 3 are shown on Exhibit 5. The estimated capital and annual costs of Alternative 3 are shown on Table 4.

ALTERNATIVE 4 - CHANNEL IMPROVEMENTS

Alternative 4 consists of channel improvements to Coon Marsh Gully and Coon Marsh Gully Diversion Ditch as proposed in Alternative 3. However, the levee improvements and internal drainage improvements proposed in Alternative 3 are excluded in Alternative 4. Alternative 4 would reduce the number of houses subject to flooding by the 100-year flood of Coon Marsh Gully from 15 to 2. The estimated capital and annual costs of Alternative 4 are presented in Table 5.

ALTERNATIVE 5 - CHANNEL AND LEVEE IMPROVEMENTS (levee north of Clemmons Gully)

Alternative 5 was developed as a result of comments received regarding Alternative 3 during review of the draft report by Hardin County WCID No. 1. Alternative 5 is essentially the same as Alternative 3 with the exception that the earthen levee is located north of Clemmons Gully (rather than along the south bank per Alternative 3), and a diversion channel is required to relocate the existing Clemmons Gully channel outside the proposed levee. With the levee located north of Clemmons Gully, two significant benefits are achieved:

1. no portion of the levee is located on property owned by Pinewood Country Club, and thus no modifications of the golf course are required
2. the existing Clemmons Gully channel provides substantial ponding storage for interior runoff thus reducing required capacity of the stormwater pumping station

Alternative 5 consists of: 1) constructing channel improvements to Coon Marsh Gully and Coon Marsh Gully Diversion Ditch to reduce house flooding which occurs during the computed 100-year flood and to prevent overflows from Coon Marsh Gully into Pinewood Estates, 2) constructing an earthen levee and associated interior drainage works to prevent

100-year backwater flooding from Little Pine Island Bayou, 3) constructing a diversion channel to route Clemmons Gully along the north side of the proposed levee, and 4) constructing internal drainage facilities with capacity to remove local 100-year flows without resultant house flooding in the Woodlawn Drive area.

Alternative 5 channel improvements for Coon Marsh Gully and Coon Marsh Gully Diversion Ditch are identical to those required in Alternative 3. As in Alternative 3, the Coon Marsh Gully improvements are required to: 1) relieve house flooding along Coon Marsh Gully and 2) prevent overflow of Coon Marsh Gully floodwaters into the leveed area further north.

The Alternative 5 earthen levee would be approximately 7900 feet in length and would have terminal points as in Alternative 3 (high ground at the west boundary of Pinewood Estates and near the golf course clubhouse). The location of the levee is shown on Exhibit 5 and Sheets 3 and 4 of Appendix 10. The top-of-levee elevation is 31.0 feet msl (same as Alternative 3) and provides the same degree of flood protection as Alternative 3.

The Clemmons Gully Diversion Channel required in Alternative 5 is located just north of the levee, as shown on Exhibit 5 and Sheets 3 and 4 of Appendix 10. The diversion channel consists of a 50 feet bottom width channel with 3:1 side slopes and is sized to pass the 100-year peak discharge

of Clemmons Gully with less than a 1.0 feet rise in existing conditions 100-year Clemmons Gully flood levels.

A stormwater pump station is required to remove rainfall runoff generated within the leveed area. Based on a HEC-1 model of 100-year runoff with flood routing through existing storage available in the Clemmons Gully channel and floodplain within the leveed area, a stormwater pump station with two 50,000 gallons per minute pumps is recommended. Two pumps are recommended to insure one pump operational at all times. The pumps would be driven by diesel engines with start-up and shut-down automated by water level of the ponding area.

A gravity outlet consisting of a 72-inch diameter RCP conduit equipped with flap and slide gates would be located at the pump station site. The gravity outlet will allow removal of interior runoff by gravity flow when the water level in Clemmons Gully is less than the water level within the leveed area.

Prevention of 100-year house flooding in the Woodlawn Drive area will require construction of drainage ditches and culverts capable of passing 100-year flows at elevations below existing house slabs. These improvements would convey runoff south to Little Pine Island Bayou.

Table 6 presents data regarding the degree of flood protection afforded floodprone homes in Pinewood Estates and Country Wood Estates by Alternative 5. The estimated capital and annual costs of Alternative 5 are shown on Table 7.

OTHER ALTERNATIVES CONSIDERED

Other alternatives considered and rejected from further consideration are as follows:

1. Clemmons Gully channel improvements - Since Little Pine Island Bayou 100-year backwater flooding extends upstream of the west boundary of Pinewood Estates, improvements to Clemmons Gully would have no impact on 100-year flood levels within Pinewood Estates.
2. Diversion of Coon Marsh Gully flood flows to Goleman Gully - Improvement of the existing diversion ditch is less expensive than construction of a new diversion ditch to Goleman Gully.
3. Coon Marsh Gully channel improvements downstream of the existing diversion ditch - These channel improvements would be more expensive than improvement to the existing diversion ditch.
4. Ring levee around Pinewood Estates - This alternative was investigated by the Corps of Engineers and found to have benefit-cost ratio of 0.4.
5. Levee improvements along Clemmons Gully without Coon Marsh Gully channel improvements - This alternative is not considered feasible due to the volume of

overflows from Coon Marsh Gully into the proposed leveed area.

AVERAGE ANNUAL BENEFITS OF ALTERNATIVES

Estimated average annual benefits of Alternatives 1,2,3, 4, and 5 are presented in Table 8. These estimates are based, in part, on previous estimates developed by the Corps of Engineers in their June 1985 report.

Estimates of flood damages to residential structures in Pinewood Estates and Country Wood Estates (item 1 of Table 8) were developed based on flood profiles presented herein, field surveyed house slab elevations, appraised property values obtained from the Hardin County Appraisal District, and depth-damage data provided by the Corps of Engineers. Appendix 7 presents calculations of expected flood damages to residential structures resulting from existing and proposed conditions 100-year, 50-year, 25-year, 10-year, 5-year, and 2-year floods of Coon Marsh Gully and from 100-year, 50-year, 25-year, and 10-year floods of Little Pine Island Bayou. Appendix 8 presents calculations of average annual flood damage to residential structures due to flooding of Coon Marsh Gully and Little Pine Island Bayou under existing and proposed conditions. This calculation represents the area below the damage-frequency curve of Coon Marsh Gully and Little Pine Island Bayou. Appendix 9 presents similar calculations of

average annual flood damage to residential structures due to flooding from Coon Marsh Gully only.

Estimates of average annual benefits for items 2 through 7 of Table 8 are based on previous estimates developed by the Corps of Engineers for a ring levee around Pinewood Estates which would provide 100-year protection similar to Alternative 3. The average annual benefits have been adjusted to reflect differences in flood protection provided by Alternatives 1, 2, 4, and 5.

Estimates of average annual benefits for restoration of land values (item 8 of Table 8) are based on discussions with real estate appraisers familiar with residential property values in Pinewood Estates in particular and the Beaumont area in general. Based on these discussions, it is believed that total property values within Pinewood Estates and Country Wood Estates will increase by 10% to 20% if the floodprone stigma associated with these subdivisions is removed. Applying a 10% increase to the combined assessed valuation of approximately $26,083,000 for Pinewood Estates and Country Wood Estates yields an increase in property values of $2,608,000, which represents a capital value or benefit resulting from removal of the flooding stigma. Annualizing this capital benefit based on an 8% interest rate and 30-year term gives an annual benefit of $231,700. This average annual benefit is considered applicable to: 1) Alternative 2 which will protect all 51 houses subject to 100-year flooding and will retain

these properties for use and 2) Alternatives 3 and 5 which will provide flood protection to 46 of 51 houses subject to 100-year flooding.

The average annual benefit of restoration of land values for Alternative 1 is based on a 10% increase applied to remaining properties after the 51 properties (with total assessed evaluation of $3,496,000) subject to 100-year flooding are purchased and abandoned. Since Alternative 4 provides flood protection to only 15 of the 51 houses subject to 100-year flooding, Alternative 4 is not considered effective in removing the floodprone stigma of Pinewood Estates and Country Wood Estates. The average annual benefit of restoration of land values for Alternative 4 is therefore calculated as resulting from a 10% increase in the property values of the 15 houses (with total assessed valuation of $902,000) afforded flood protection by this alternative.

ECONOMIC COMPARISON OF ALTERNATIVES

Table 9 presents an economic comparison of Alternatives 1, 2, 3, 4, and 5. Estimated annual costs of Alternatives 1 and 2 are based on amortization of estimated capital costs using an 8% interest rate and 30-year term.

As shown in Table 9, Alternatives 4 and 5 have the highest benefit-cost ratios (1.37 and 1.35, respectively). Alternative 2 has a benefit-cost ratio above unity (1.21) while that of Alternative 1 is slightly below unity (0.92).

ENVIRONMENTAL CONSIDERATIONS

The environmental impacts of any of the 4 alternatives discussed herein are considered to be relatively small since almost all proposed work would be conducted in existing residential subdivisions. The structural aspects of Alternatives 3, 4, and 5 require significant channel excavation to widen and deepen the channels of Coon Marsh Gully and Coon Marsh Gully Diversion Ditch. However, such improvements would be in channel reaches which traverse Country Wood Estates and Pinewood Estates with the exception of approximately 2,000 linear feet of improvements to Coon Marsh Gully upstream of Country Wood Estates and downstream of State Highway 105. the channel improvements would have very little impact on downstream conditions in Little Pine Island Bayou due to the relative flows involved. Little Pine Island Bayou has a drainage area of 80,000 acres compared to the drainage area of Coon Marsh Gully of 1,120 acres. The 100-year peak discharge of Little Pine Island Bayou is 12,800 cfs compared to 1,100 cfs for Coon Marsh Gully.

Since Alternatives 3, 4, and 5 require work to be accomplished in low-lying areas along Coon Marsh Gully and Clemmons Gully, it will be necessary to contact the Corps of Engineers to determine if Section 404 or Section 10 permits are required.

WOODWAY BLVD. BRIDGE REPLACEMENT

During the course of this study, it became known that the Woodway Blvd. bridge at Little Pine Island Bayou would soon be replaced by a larger structure. Due to numerous houses within Pinewood Estates subject to flooding by Little Pine Island Bayou, the new bridge structure should be designed to pass the 100-year peak flood discharge of Little Pine Island Bayou with no increase in upstream existing conditions 100-year flood levels. Based on hydraulic analyses conducted during this study, it is recommended that the new bridge should have elevations and dimensions (or equivalent 100-year flow area of approximately 2,300 square feet) as follows: 1) a bridge low chord elevation no lower than 30.0 feet msl, 2) a flood channel bottom width of 200 feet at elevation 20 feet msl with concrete side slopes of 2:1, and 3) a pilot channel of 10 feet bottom width with side slopes of 3:1 at the existing stream bed elevation of 8 feet msl.

RECOMMENDED DESIGN STANDARDS

To insure future development within Pinewood Estates will not adversely impact existing flooding hazards or create new flooding or drainage problems, the following design standards are recommended:

1. To prevent 100-year flooding, all house slabs should be elevated a minimum of 12 inches above the

appropriate 100-year flood elevations presented herein.

2. To reduce the likelihood of flooding from site drainage, all new house slabs should be elevated a minimum of 18 inches above natural ground at the building site.

3. To reduce the likelihood of flooding from stormwater runoff which exceeds the design capacity of internal drainage facilities (ditches, culverts, etc.), all new house slabs should be built a minimum of 12 inches above an identified overflow elevation which controls the level to which ponded water will rise. The overflow elevation will normally be the lowest point in the street pavement in the general vicinity of the building site.

4. All new drainage structures should be designed for runoff resulting from the 10-year storm, as a minimum design standard.

5. New subdivision development should provide a detailed engineering report prepared by a registered professional engineer which outlines compliance with items 1 through 4 above.

6. Prior to providing water and sewer service to new homes, compliance with items 1 through 4 above should be verified by a field survey performed by a registered public surveyor.

TABLE 4

ESTIMATED CAPITAL AND ANNUAL COSTS OF ALTERNATIVE 3

ESTIMATED CAPITAL COST

I.	**COON MARSH GULLY AND DIVERSION DITCH CHANNEL IMPROVEMENTS**			**$ 571,000**
	A.	land acquisition: 18 Ac @ $4000/Ac	$ 72,000	
	B.	channel excavation: 160,000 CY @ $2/CY	320,000	
	C.	hydromulch: 120,000 SY @ $0.50/SY	60,000	
	D.	Pinewood Blvd. bridge: 2400 SF @ $30/SF	63,000	
	E.	Bonura Rd. North bridge: 1860 SF @ $30/SF	56,000	
II.	**LEVEE AND INTERIOR DRAINAGE WORKS IMPROVEMENTS**			
	A.	levee		**$ 698,000**
		1. easement acquisition: 22 Ac @ $4000/Ac	$ 88,000	
		2. clearing and grubbing: 11 Ac @ $1000/Ac	11,000	
		3. foundation preparation: 18,600 CY @ $2/CY	37,000	
		4. compacted fill: 96,800 CY @ $5/CY	484,000	
		5. drainage channels: 19,500 CY @ $2/CY	39,000	
		6. hydromulch: 78,000 SY @ $0.50/SY	39,000	
	B.	storm water pump station		**$ 648,000**
		1. excavation and fill	$ 18,000	
		2. pump house and sump	160,000	
		3. pumps and diesel engines	350,000	
		4. piping and discharge structure	30,000	
		5. gravity outlet	60,000	
		6. site work and miscellaneous	30,000	
	C.	modifications to Pinewood golf course		**$ 600,000**
III.	**INTERNAL DRAINAGE FACILITIES NEAR WOODLAWN DRIVE**			**$ 40,000**
		Total Estimated Construction Cost		**$2,557,000**
		Engineering and Contingencies (20%)		**511,000**
		Total Estimated Capital Cost		**$3,068,000**

ESTIMATED ANNUAL COST

I.	Amortized Capital Cost (8%, 30 years)	**$ 273,000**
II.	Operation and Maintenance	**45,000**
	Total Estimated Annual Cost	**$ 318,000**

INSTITUTIONAL AND LEGAL ANALYSIS

Hardin County Water Control & Improvement District No. 1

Flood Protection Planning Study Final Report
and Institutional Analysis

TWDB Contract No. 8-483-514

TABLE OF CONTENTS

Institutional and Legal Analysis

Introduction

This letter will constitute the draft final report by the undersigned of the possible legal and institutional alternatives to control flooding and to abate flood damage within the District and surrounding areas. In preparing this draft final report, the undersigned has incorporated various aspects of the "Flood Control Study: Revised Draft Report" dated January, 1990, prepared by KSA Engineers, Inc. ("KSA") as the consulting engineers to the District (the "Flood Control Report").

This report should be read in conjunction with the preliminary report by the undersigned dated December 14, 1987 submitted to the District in which the undersigned prepared a review of the powers and duties of a water control and improvement district, the present regulations undertaken by the District to abate flood damage, a review of responsibilities for flood control and abatement, and possible institutional alternatives for future coordinated flood control and drainage.

In this report, a brief summary statement of legal and implementation problems with various alternatives presented by KSA is provided. The undersigned has concentrated the discussion for implementation of the Flood Control Report on Alternative 5 as the recommended alternative by KSA.

In addition to a review of legal and institutional aspects of each alternative, the undersigned has reviewed the effect of various matters that would impact all of the alternatives reviewed by KSA.

A. LEGAL EVALUATION OF ALTERNATIVES.

1. Alternative No. 1 - Buy-Out of Flood Prone Properties. In order to achieve an acquisition and removal of flood prone properties, the District would have to engage in extensive cost associated with appraisals of residences within Pinewood Estates and possibly within Countrywood Estates as shown by the Flood Control Study. The Flood Control Report clearly indicates that the District would need to acquire properties both within and outside the District including properties within Countrywood Estates immediately south of the District. The District has powers under Section 51.231 of the Texas Water Code to exercise the power of eminent domain over land "located inside or outside the district." Further, it seems that the acquisition of such property would be within the purposes of the District as stated in 51.121 of the Water Code wherein the District is authorized "to provide for improvements of rivers, creeks, and streams to prevent overflows or to aid in these purposes." Further the District is authorized to control, store, preserve and distribute

its waters and flood waters and the waters of its rivers and streams for irrigation, power and other useful purposes. The District is also authorized to control, abate and change any shortage or harmful excess of water. In light of the cost to benefit of this alternative, further legal analysis has not been pursued.

2. Alternate No. 2 - Raise Flood Plain Structures. As stated in the Flood Control Report, the economic benefits and costs of this alternative is questionable in light of other more favorable alternatives. Further, the attempt to acquire and use public funds on private property calls into question certain limitations including those found in Article III, Section 52 of the Texas Constitution which provides that political subdivisions of the state may not lend their credit or grant public money or things of value in aid of or to an individual. Further, the District's involvement with modification of the foundation of existing flood prone structures could give rise to serious questions of legal liability which could not currently be valued or anticipated but are of sufficient legal concern that this alternative does not seem viable.

3. Alternate No. 3 - Channel and Levee Improvements (Levee South of Clemmons Gully). The primary restriction on this alternative is the considerable cost that would be associated with attempting to acquire property currently incorporated within the Pinewood Country Club. As an operating business and in light of the material impact that this would have on the golf course facilities of the Pinewood Country Club, the cost of this alternative including anticipated condemnation actions give rise to serious legal concerns. KSA has estimated an acquisition cost of $4,000 per acre which may not take into consideration the loss of economic benefit that may be associated with the attempt to take a part of the operations of a going business. Further, costs and time delays might be anticipated if the condemnation action was started to acquire the property of a going concern.

While this alternative is viable, the cost and time elements associated with acquiring or condemning property of a going concern would mitigate in favor of other alternatives as identified in the Flood Control Report and as analyzed in this report.

4. Alternative No. 4 - Channel Improvements. Alternative No. 4 consists of channel improvements to Coon Marsh Gully and Coon Marsh Diversion Ditch as proposed in Alternative No. 3 without certain levee improvements and internal drainage improvements provided for in Alternative 3. This alternative may involve similar problems to that identified in Alternative No. 3 as to the land acquisition problems associated with channel excavation and diversion ditch channel improvements, but since this alternative is a lesser included version of Alternative No. 3, the problems are essentially the same.

5. Alternative No. 5 - Channel and Levee Improvements (Levee North of Clemmons Gully). As with Alternative No. 3, this alternative contemplates the acquisition of approximately 18 acres of property within the District. This property would have to be acquired from the existing property owner, if a negotiated value could not be reached then the powers of eminent domain as previously described might have to be exercised by the District. If any part or all of the property to be acquired for the levee north of Clemmons Gully is owned by a "developer" within the District, then the price for the property must be limited to the price paid by the developer for such land plus carrying charges as more fully set forth in 31 Texas Administrative Code Section 293.51. The "developer of property within the district" is defined in Section 51.0721(d) of the Texas Water Code as:

> "Any person who owns land within a district covered under this section and who has divided or proposed to divide the land into two or more parts for the purpose of laying out any subdivision of any tract of land or any addition to any town or city, or for laying out suburban lots or for building lots, or any lots and streets, alleys, or parks or other portions intended for public use, or the use of purchasers or owners of lots fronting thereon or adjacent thereto."

The acquisition of property for levee improvements north of Clemmons Gully are apparently not within the Pinewood Country Club and do not impact any going business other than land development, agricultural or timber uses. The preliminary report of the undersigned as to Phase I of the Flood Control & Drainage Study, indicated there was a possible impact of the Big Thicket National Preserve. The undersigned has been advised that the proposed channel and levee improvements north of Clemmons Gully would not impact directly any property within the Big Thicket National Preserve. The undersigned has also based this report on statements that the levee improvements north of Clemmons Gully would not have any negative environmental impact on the Big Thicket National Preserve.

B. FINANCIAL ANALYSIS OF FLOOD ABATEMENT ALTERNATIVES

1. Source of Financing for Flood Abatement Improvements. If the District chooses to implement Alternative No. 5, the District would need funding of approximately $2,580,000.00. The annual repayment of the capital costs has been based by KSA on the District securing an eight percent (8%) loan with a thirty (30) year loan amortization. This gives rise to an estimated annual cost of $229,000.00 plus increased operation and maintenance expenses of $45,000.00 for a total estimated annual cost for the proposed improvements of $274,000.00. The District could attempt to obtain funding for these improvements through the issuance of either (i) tax and revenue bonds sold to the public, (ii) tax and revenue bonds through funding acquired

through the Texas Water Development Board, (iii) tax and revenue bonds and by other state agencies and/or federal agencies having funds for such purposes.

2. Application for Grant Funding. Because of the substantial benefit which the flood control improvements might have on the District, it is also possible that the District could obtain grant funding for part of the estimated capital costs of Alternative No. 5. The District is currently considering an application to the Federal Emergency Management Agency which is providing funds through the Texas Department of Public Safety, Division of Emergency Management. The District may also be able to obtain grant funding through other stated and federal grant programs to fund part or perhaps specific elements of the proposed improvements. The pursuit of these grants is considered essential.

3. Ad Valorem Tax Base. In the 1989 District Status Report filed with the Texas Water Commission, the District has reported a net certified value of taxable property within the District as $23,764,040.00. This was a slight reduction from the certified tax roll in 1988. The District has also reported to the Texas Water Commission that it is currently servicing debts on two bond issues as hereinafter described which have a total principal amount outstanding as of September 30, 1989 of $655,000.00. The total annual debt service on the outstanding debts are also stated below:

(a) Table of Information on Bonds Issued and Outstanding:

Original Principal Amount Issued	Year of Issue	Net Effect. Interest Rate	Legal Security for Bonds	Primary Method of Repayment	Rated	Insured	Other Credit Support
$900,000	1964	5.0%	Comb. Revenue and Taxes	Tax Revenue	No	No	No
300,000	1982	5.0%			No	No	No

(b) Total Annual Debt Service on Outstanding Debt:

Calendar Year	Combined Principal and Interest Due Each Year
1989*	
1990	$98,030
1991	94,690
1992	96,350
1993	97,730
1994	93,830
1995	89,930
1996	86,030
1997	82,130

1998	44,480
1999	42,240
2000	0
2001	0
2002	0
2003	0
2004	0
2005	0
2006	0
2007	0
2008	0
2009	0
2010	0
2011	0
2012	0

*For 1989, only payments due after September 30, 1989 and before January 1, 1990.

(c) Average Annual Debt Service Requirement: $82,544

(d) Maximum Annual Debt Service Requirement: $98,030

In order to provide debt service funding for an additional $229,000.00 of amortized capital costs, the District would result in a marked increase in the ad valorem tax rates assessed against property within the District. Currently, the District has a debt service tax rate of $0.40 per $100.00 of tax valuation. While the issuance of bonds in the amount necessary to provide sufficient funding for the estimated capital costs of Alternative No. 5 are within the limits of the Texas Constitution which the District might have authority to issue, the issuance of bonds to fully fund the improvements could result in a substantial tax rate increase within the District.

4. Bond Election. The District has also reported to the Texas Water Commission that it has authorized $2,250,000.00 of bonds of which $1,200,000.00 were previously issued and $655,000.00 are currently outstanding. The District therefore would not have sufficient bond authority without grant funding to fund capital costs of Alternative No. 5 from existing bond authority. Further, under the bond order of the District dated April 29, 1964, the interest rate on the District's bonds was limited to six percent (6%) per annum. This interest rate is lower than current interest rates for comparable bond issues. The District must therefore consider a bond election to obtain approval from the electoral to issue bonds necessary to fund the capital costs of Alternative No. 5. The District may call a bond election in accordance with Section 51.401, et. seq. of the Texas Water Code. Since the District was organized under Article XVI, Section 59 of the Texas Constitution, the bonds would be issued only with the approval of a majority of the electors of the District participating in the election. A bond election has to be held on the uniform dates provided for in the Texas Election

Code with the next uniform date as the first Saturday in May, with the next uniform election date thereafter being the second Saturday in August as provided in Section 41.001, Texas Election Code.

5. Water/Sewer System Revenues. In addition to ad valorem taxes for a basis for repayment of the debt service requirements for the cost of the improvements under Alternative No. 5, the District also has water and sewer system revenues. The District currently has water rates that are not based upon usage but are based upon a flat fee. For the Texas Water Commission to approve bonds for construction of the proposed capital costs under Alternative No. 5, the District may have to consider or may be ordered to implement the use of water meters and the setting of revenues based upon usage rather than a flat fee basis. This would encourage water conservation. A water conservation plan may be required for approval of bonds in accordance with 31 Texas Administrative Code Section 293.41, et. seq.

6. Improvements Outside District: Alternative No. 5 provides for improvements that will provide flood protection to areas not currently within the District, including homes within Countrywood Estates lying immediately south of the District. While the District may expend its funds for improvements outside the District as stated above, these residents are not currently served with the water and/or sanitary sewage system of the District so the District derives no revenues from this area nor is this area within the District so none of the property could currently be taxes to offset the estimated annual debt service costs for the capital costs under Alternative No. 5. The District can add territory to the District in accordance with Section 51.691, et. seq. of the Texas Water Code, but the undersigned has no knowledge at this time whether the residents of Countrywood wish to be brought within the District or would be willing to bear a proportionate share of the costs of the improvements anticipated under Alternative No. 5. Since Countrywood Estates is not within any separate political subdivision within Hardin County, it may be difficult for the District to require assessments or charges for regional stormwater management in Countrywood Estates as might otherwise be allowed to a District for participation in a regional drainage system in accordance with 31 Texas Administrative Code Section 293.53.

C. GENERAL CONSIDERATION FOR FLOOD ABATEMENT IMPLEMENTATION

1. Bridge and Culvert Improvements. The estimated capital costs of Alternative No. 5 include expenditures for improvements to the Pinewood Boulevard bridge and the Bonura Road North bridge which is located outside the District. 31 Texas Administrative Code, Section 293.44(12) provides that "the cost of replacement of existing bridges and culverts not constructed or installed by the developer or the cost of new bridges and culverts across

existing roads not financed or constructed by the developer, may be financed by the District, except that any cost of increase in the traffic carrying capacity of bridges and culverts shall not be financed by the District." An evaluation of the ability to finance these costs by the District will have to be made.

2. Access to Property Outside the District. Since some improvements contemplated by Alternative No. 5 are outside the District, the District will have to determine that all of the areas for which improvements are contemplated are within existing, dedicated easements or rights-of-way or will be placed within existing easements or rights-of-way, so that the District may have access to these areas. Again, the District may not benefit private persons, businesses or corporations with public funds, so all improvements within and outside the District would have to be for the general public.

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1. Institutional Alternatives for Flood Control and Abatement. In the preliminary report presented by the undersigned to the District dated December 14, 1987, a number of institutional alternatives for flood control and abatement were presented including the use of the District and other general and special law districts, including municipal utility districts, water control and improvement districts, and drainage districts. Due to the substantial tax increase that would be associated with implementing Alternative No. 5 within the boundaries of the District, and since benefits would be derived from property outside the District, the use of an alternate to the District implementation of the flood control and drainage improvements would seem beneficial. A larger ad valorem tax base with perhaps larger revenues would reduce the direct and impact of these improvements on the residents of the District.

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By creation of a special district through legislation placed before the Texas legislature, the act creating a special district can sometimes be drafted to allow a special district to have powers and rights that it might not otherwise be able to have if formed strictly under the guidelines through application to the Texas Water Commission. Both creation of a district through application to the Texas Water Commission and by creation through acts of the Texas legislature can be time consuming. However, creation through formation of a new special district requires action at a regular or special legislative session, and the district's organization has to be confirmed through a confirmation election. Considering the improvements to Countrywood Estates, it would seem probable that any new political subdivision would include Countrywood Estates. If this area was left out of any newly formed political subdivision, you would have the difficulty of requiring property owners in this area to help pay for the cost of the improvements. Further, Countrywood Estates residents might not have to abide by flood control and drainage ordinances which might be adopted by the district or another new entity unless they were a part of the new entity.

3. Form of Entity to Implement Flood Control Improvements. The undersigned prefers the creation of a special district before the legislature having as its boundaries the area impacted or to potentially benefit from the flood control improvements including undeveloped timber acreage around the District as well as Countrywood Estates. The formation of a new district to handle flood control and drainage problems, including Countrywood Estates, would require a confirmation election if handled through special acts before the Texas Legislature, but such confirmation election might be favorably considered since residents of both Countrywood Estates and Pinewood Estates could directly benefit from these improvements.

E. ORDINANCES.

1. Existing Ordinances. The District has in place a flood control and drainage ordinance which requires slab elevations above the 100 year flood plain certified to by a registered, professional engineer. Further, the District has adopted resolutions and rules for sanitary sewage system connections and repairs in an effort to resolve overloading of sewage system facilities from flood water inflow.

2. Enforcement of Ordinances. The District is currently enforcing its ordinances but if hampered, it has no authority to impose these ordinances on any property owners outside the District, and the inability to be able to control future development and to have uniform enforcement of flood protection ordinances in areas outside the District but which impact the District, including Countrywood Estates, could negatively impact any potential flood control improvements and programs hereafter instituted.

F. CONCLUSION

The undersigned feels that there are substantial benefits that may be derived from providing the citizens within the District the opportunity to determine whether they would like to pursue bond financing for flood control and drainage improvements either limited to bonds issued by the District and to be replaced solely through tax and other resources generated within the District, or whether the residents of the District would consider implementation of a special purpose district for flood control and drainage that would include areas currently lying outside the boundaries of the District.

The District may wish to investigate the suggested possibility of used its current bond authority together with grant funding to pursue the proposed improvements under Alternative No. 5 if sufficient grant funding is made available or to consider the improvements under Alternative No. 4 through existing bond authority if grant funding is not available to complete the improvements suggested under Alternative No. 5.

INSTITUTIONAL AND LEGAL ANALYSIS

Hardin County Water Control & Improvement District No. 1

Flood Protection Planning Study Final Report
and Institutional Analysis

TWDB Contract No. 8-483-514

TABLE OF CONTENTS

Institutional and Legal Analysis

Introduction

This letter will constitute the draft final report by the undersigned of the possible legal and institutional alternatives to control flooding and to abate flood damage within the District and surrounding areas. In preparing this draft final report, the undersigned has incorporated various aspects of the "Flood Control Study: Revised Draft Report" dated January, 1990, prepared by KSA Engineers, Inc. ("KSA") as the consulting engineers to the District (the "Flood Control Report").

This report should be read in conjunction with the preliminary report by the undersigned dated December 14, 1987 submitted to the District in which the undersigned prepared a review of the powers and duties of a water control and improvement district, the present regulations undertaken by the District to abate flood damage, a review of responsibilities for flood control and abatement, and possible institutional alternatives for future coordinated flood control and drainage.

In this report, a brief summary statement of legal and implementation problems with various alternatives presented by KSA is provided. The undersigned has concentrated the discussion for implementation of the Flood Control Report on Alternative 5 as the recommended alternative by KSA.

In addition to a review of legal and institutional aspects of each alternative, the undersigned has reviewed the effect of various matters that would impact all of the alternatives reviewed by KSA.

A. LEGAL EVALUATION OF ALTERNATIVES.

1. Alternative No. 1 - Buy-Out of Flood Prone Properties. In order to achieve an acquisition and removal of flood prone properties, the District would have to engage in extensive cost associated with appraisals of residences within Pinewood Estates and possibly within Countrywood Estates as shown by the Flood Control Study. The Flood Control Report clearly indicates that the District would need to acquire properties both within and outside the District including properties within Countrywood Estates immediately south of the District. The District has powers under Section 51.231 of the Texas Water Code to exercise the power of eminent domain over land "located inside or outside the district." Further, it seems that the acquisition of such property would be within the purposes of the District as stated in 51.121 of the Water Code wherein the District is authorized "to provide for improvements of rivers, creeks, and streams to prevent overflows or to aid in these purposes." Further the District is authorized to control, store, preserve and distribute

its waters and flood waters and the waters of its rivers and streams for irrigation, power and other useful purposes. The District is also authorized to control, abate and change any shortage or harmful excess of water. In light of the cost to benefit of this alternative, further legal analysis has not been pursued.

2. Alternate No. 2 - Raise Flood Plain Structures. As stated in the Flood Control Report, the economic benefits and costs of this alternative is questionable in light of other more favorable alternatives. Further, the attempt to acquire and use public funds on private property calls into question certain limitations including those found in Article III, Section 52 of the Texas Constitution which provides that political subdivisions of the state may not lend their credit or grant public money or things of value in aid of or to an individual. Further, the District's involvement with modification of the foundation of existing flood prone structures could give rise to serious questions of legal liability which could not currently be valued or anticipated but are of sufficient legal concern that this alternative does not seem viable.

3. Alternate No. 3 - Channel and Levee Improvements (Levee South of Clemmons Gully). The primary restriction on this alternative is the considerable cost that would be associated with attempting to acquire property currently incorporated within the Pinewood Country Club. As an operating business and in light of the material impact that this would have on the golf course facilities of the Pinewood Country Club, the cost of this alternative including anticipated condemnation actions give rise to serious legal concerns. KSA has estimated an acquisition cost of $4,000 per acre which may not take into consideration the loss of economic benefit that may be associated with the attempt to take a part of the operations of a going business. Further, costs and time delays might be anticipated if the condemnation action was started to acquire the property of a going concern.

While this alternative is viable, the cost and time elements associated with acquiring or condemning property of a going concern would mitigate in favor of other alternatives as identified in the Flood Control Report and as analyzed in this report.

4. Alternative No. 4 - Channel Improvements. Alternative No. 4 consists of channel improvements to Coon Marsh Gully and Coon Marsh Diversion Ditch as proposed in Alternative No. 3 without certain levee improvements and internal drainage improvements provided for in Alternative 3. This alternative may involve similar problems to that identified in Alternative No. 3 as to the land acquisition problems associated with channel excavation and diversion ditch channel improvements, but since this alternative is a lesser included version of Alternative No. 3, the problems are essentially the same.

5. Alternative No. 5 - Channel and Levee Improvements (Levee North of Clemmons Gully). As with Alternative No. 3, this alternative contemplates the acquisition of approximately 18 acres of property within the District. This property would have to be acquired from the existing property owner, if a negotiated value could not be reached then the powers of eminent domain as previously described might have to be exercised by the District. If any part or all of the property to be acquired for the levee north of Clemmons Gully is owned by a "developer" within the District, then the price for the property must be limited to the price paid by the developer for such land plus carrying charges as more fully set forth in 31 Texas Administrative Code Section 293.51. The "developer of property within the district" is defined in Section 51.0721(d) of the Texas Water Code as:

> "Any person who owns land within a district covered under this section and who has divided or proposed to divide the land into two or more parts for the purpose of laying out any subdivision of any tract of land or any addition to any town or city, or for laying out suburban lots or for building lots, or any lots and streets, alleys, or parks or other portions intended for public use, or the use of purchasers or owners of lots fronting thereon or adjacent thereto."

The acquisition of property for levee improvements north of Clemmons Gully are apparently not within the Pinewood Country Club and do not impact any going business other than land development, agricultural or timber uses. The preliminary report of the undersigned as to Phase I of the Flood Control & Drainage Study, indicated there was a possible impact of the Big Thicket National Preserve. The undersigned has been advised that the proposed channel and levee improvements north of Clemmons Gully would not impact directly any property within the Big Thicket National Preserve. The undersigned has also based this report on statements that the levee improvements north of Clemmons Gully would not have any negative environmental impact on the Big Thicket National Preserve.

B. FINANCIAL ANALYSIS OF FLOOD ABATEMENT ALTERNATIVES

1. Source of Financing for Flood Abatement Improvements. If the District chooses to implement Alternative No. 5, the District would need funding of approximately $2,580,000.00. The annual repayment of the capital costs has been based by KSA on the District securing an eight percent (8%) loan with a thirty (30) year loan amortization. This gives rise to an estimated annual cost of $229,000.00 plus increased operation and maintenance expenses of $45,000.00 for a total estimated annual cost for the proposed improvements of $274,000.00. The District could attempt to obtain funding for these improvements through the issuance of either (i) tax and revenue bonds sold to the public, (ii) tax and revenue bonds through funding acquired

through the Texas Water Development Board, (iii) tax and revenue bonds and by other state agencies and/or federal agencies having funds for such purposes.

2. Application for Grant Funding. Because of the substantial benefit which the flood control improvements might have on the District, it is also possible that the District could obtain grant funding for part of the estimated capital costs of Alternative No. 5. The District is currently considering an application to the Federal Emergency Management Agency which is providing funds through the Texas Department of Public Safety, Division of Emergency Management. The District may also be able to obtain grant funding through other stated and federal grant programs to fund part or perhaps specific elements of the proposed improvements. The pursuit of these grants is considered essential.

3. Ad Valorem Tax Base. In the 1989 District Status Report filed with the Texas Water Commission, the District has reported a net certified value of taxable property within the District as $23,764,040.00. This was a slight reduction from the certified tax roll in 1988. The District has also reported to the Texas Water Commission that it is currently servicing debts on two bond issues as hereinafter described which have a total principal amount outstanding as of September 30, 1989 of $655,000.00. The total annual debt service on the outstanding debts are also stated below:

(a) Table of Information on Bonds Issued and Outstanding:

Original Principal Amount Issued	Year of Issue	Net Effect. Interest Rate	Legal Security for Bonds	Primary Method of Repayment	Rated	Insured	Other Credit Support
$900,000	1964	5.0%	Comb. Revenue and Taxes	Tax Revenue	No	No	No
300,000	1982	5.0%			No	No	No

(b) Total Annual Debt Service on Outstanding Debt:

Calendar Year	Combined Principal and Interest Due Each Year
1989*	
1990	$98,030
1991	94,690
1992	96,350
1993	97,730
1994	93,830
1995	89,930
1996	86,030
1997	82,130

1998	44,480
1999	42,240
2000	0
2001	0
2002	0
2003	0
2004	0
2005	0
2006	0
2007	0
2008	0
2009	0
2010	0
2011	0
2012	0

*For 1989, only payments due after September 30, 1989 and before January 1, 1990.

(c) Average Annual Debt Service Requirement: $82,544

(d) Maximum Annual Debt Service Requirement: $98,030

In order to provide debt service funding for an additional $229,000.00 of amortized capital costs, the District would result in a marked increase in the ad valorem tax rates assessed against property within the District. Currently, the District has a debt service tax rate of $0.40 per $100.00 of tax valuation. While the issuance of bonds in the amount necessary to provide sufficient funding for the estimated capital costs of Alternative No. 5 are within the limits of the Texas Constitution which the District might have authority to issue, the issuance of bonds to fully fund the improvements could result in a substantial tax rate increase within the District.

4. Bond Election. The District has also reported to the Texas Water Commission that it has authorized $2,250,000.00 of bonds of which $1,200,000.00 were previously issued and $655,000.00 are currently outstanding. The District therefore would not have sufficient bond authority without grant funding to fund capital costs of Alternative No. 5 from existing bond authority. Further, under the bond order of the District dated April 29, 1964, the interest rate on the District's bonds was limited to six percent (6%) per annum. This interest rate is lower than current interest rates for comparable bond issues. The District must therefore consider a bond election to obtain approval from the electoral to issue bonds necessary to fund the capital costs of Alternative No. 5. The District may call a bond election in accordance with Section 51.401, et. seq. of the Texas Water Code. Since the District was organized under Article XVI, Section 59 of the Texas Constitution, the bonds would be issued only with the approval of a majority of the electors of the District participating in the election. A bond election has to be held on the uniform dates provided for in the Texas Election

Code with the next uniform date as the first Saturday in May, with the next uniform election date thereafter being the second Saturday in August as provided in Section 41.001, Texas Election Code.

5. Water/Sewer System Revenues. In addition to ad valorem taxes for a basis for repayment of the debt service requirements for the cost of the improvements under Alternative No. 5, the District also has water and sewer system revenues. The District currently has water rates that are not based upon usage but are based upon a flat fee. For the Texas Water Commission to approve bonds for construction of the proposed capital costs under Alternative No. 5, the District may have to consider or may be ordered to implement the use of water meters and the setting of revenues based upon usage rather than a flat fee basis. This would encourage water conservation. A water conservation plan may be required for approval of bonds in accordance with 31 Texas Administrative Code Section 293.41, et. seq.

6. Improvements Outside District: Alternative No. 5 provides for improvements that will provide flood protection to areas not currently within the District, including homes within Countrywood Estates lying immediately south of the District. While the District may expend its funds for improvements outside the District as stated above, these residents are not currently served with the water and/or sanitary sewage system of the District so the District derives no revenues from this area nor is this area within the District so none of the property could currently be taxes to offset the estimated annual debt service costs for the capital costs under Alternative No. 5. The District can add territory to the District in accordance with Section 51.691, et. seq. of the Texas Water Code, but the undersigned has no knowledge at this time whether the residents of Countrywood wish to be brought within the District or would be willing to bear a proportionate share of the costs of the improvements anticipated under Alternative No. 5. Since Countrywood Estates is not within any separate political subdivision within Hardin County, it may be difficult for the District to require assessments or charges for regional stormwater management in Countrywood Estates as might otherwise be allowed to a District for participation in a regional drainage system in accordance with 31 Texas Administrative Code Section 293.53.

C. GENERAL CONSIDERATION FOR FLOOD ABATEMENT IMPLEMENTATION

1. Bridge and Culvert Improvements. The estimated capital costs of Alternative No. 5 include expenditures for improvements to the Pinewood Boulevard bridge and the Bonura Road North bridge which is located outside the District. 31 Texas Administrative Code, Section 293.44(12) provides that "the cost of replacement of existing bridges and culverts not constructed or installed by the developer or the cost of new bridges and culverts across

existing roads not financed or constructed by the developer, may be financed by the District, except that any cost of increase in the traffic carrying capacity of bridges and culverts shall not be financed by the District." An evaluation of the ability to finance these costs by the District will have to be made.

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The undersigned feels that there are substantial benefits that may be derived from providing the citizens within the District the opportunity to determine whether they would like to pursue bond financing for flood control and drainage improvements either limited to bonds issued by the District and to be replaced solely through tax and other resources generated within the District, or whether the residents of the District would consider implementation of a special purpose district for flood control and drainage that would include areas currently lying outside the boundaries of the District.

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TABLE 5

ESTIMATED CAPITAL AND ANNUAL COSTS OF ALTERNATIVE 4

ESTIMATED CAPITAL COST

I.	COON MARSH GULLY AND DIVERSION DITCH CHANNEL IMPROVEMENTS			$ 571,000
	A.	land acquisition: 18 Ac @ $4000/Ac	$ 72,000	
	B.	channel excavation: 160,000 CY @ $2/CY	320,000	
	C.	hydromulch: 120,000 SY @ $0.50/SY	60,000	
	D.	Pinewood Blvd. bridge: 2400 SF @ $30/SF	63,000	
	E.	Bonura Rd. North bridge: 1860 SF @ $30/SF	56,000	

Total Estimated Construction Cost	**$571,000**
Engineering and Contingencies (20%)	**114,000**
Total Estimated Capital Cost	**$685,000**

ESTIMATED ANNUAL COST

I.	Amortized Capital Cost (8%, 30 years)	**$ 61,000**
II.	Operation and Maintenance	**5,000**
	Total Estimated Annual Cost	**$ 66,000**

TABLE 6

FLOOD PROTECTION PROVIDED BY ALTERNATIVE 5

Flood Exceedance Frequency	Number of Floodprone Houses Protected by Alternative 5		
	Pinewood Estates	Country Wood Estates	Total
100-Year	36 of 42	7 of 9	43 of 51
50-Year	22 of 23	7 of 8	29 of 31
25-Year	13 of 13	5 of 5	18 of 18
10-Year	6 of 6	4 of 4	10 of 10
5-Year	5 of 5	4 of 4	9 of 9
2-Year	------	2 of 2	2 of 2

TABLE 7

ESTIMATED CAPITAL AND ANNUAL COSTS OF ALTERNATIVE 5

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	B.	channel excavation: 160,000 CY @ $2/CY	320,000	
	C.	hydromulch: 120,000 SY @ $0.50/SY	60,000	
	D.	Pinewood Blvd. bridge: 2400 SF @ $30/SF	63,000	
	E.	Bonura Rd. North bridge: 1860 SF @ $30/SF	56,000	
II.	**CLEMMONS GULLY DIVERSION CHANNEL, LEVEE, AND INTERIOR DRAINAGE WORKS IMPROVEMENTS**			
	A.	diversion channel and levee		**$1,045,000**
		1. easement acquisition: 36 Ac @ $4000/Ac	$ 144,000	
		2. clearing and grubbing: 20 Ac @ $1000/Ac	20,000	
		3. diversion channel excavation: 266,400 CY @ $2/CY	533,000	
		4. levee foundation preparation: 10,300 CY @ $2/CY	21,000	
		5. levee compacted fill: 48,000 CY @ $5/CY	240,000	
		6. hydromulch: 174,000 SY @ $0.50/SY	87,000	
	B.	storm water pump station		**$ 495,000**
		1. excavation and fill	$ 15,000	
		2. pump house and sump	140,000	
		3. pumps and diesel engines	230,000	
		4. piping and discharge structure	30,000	
		5. gravity outlet	50,000	
		6. site work and miscellaneous	30,000	
	C.	modifications to Pinewood golf course		**$ -0-**
III.	**INTERNAL DRAINAGE FACILITIES NEAR WOODLAWN DRIVE**			**$ 40,000**
Total Estimated Construction Cost				**$2,151,000**
		Engineering and Contingencies (20%)		**430,000**
		Total Estimated Capital Cost		**$2,580,000**

ESTIMATED ANNUAL COST

I.	Amortized Capital Cost (8%, 30 years)	**$ 229,000**
II.	Operation and Maintenance	**45,000**
	Total Estimated Annual Cost	**$ 274,000**

TABLE 8

ESTIMATED AVERAGE ANNUAL BENEFITS OF ALTERNATIVES

Item	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
1. prevention of damages to residential structures	$ 93,400	$ 93,400	$ 91,800	$ 68,500	$ 91,800
2. reduction of vehicle losses	5,600	-0-	5,600	1,700	5,600
3. reduction of road damages	-0-	-0-	1,200	400	1,200
4. reduction of utility damages	3,700	3,700	1,200	100	1,200
5. reduction of emergency cost	-0-	8,500	3,700	1,100	3,700
6. affluence	-0-	8,500	8,500	2,600	8,500
7. reduction in National Flood Insurance administration cost	25,800	25,800	25,800	7,700	25,800
8. restoration of land values	200,600	231,700	231,700	8,000	231,700
Total	$329,100	$363,100	$368,700	$90,100	$368,700

TABLE 9

ECONOMIC COMPARISON OF ALTERNATIVES

Alternative	Estimated Capital Cost	Estimated Annual Cost	Estimated Average Annual Benefit	Benefit-Cost Ratio
1	$4,020,000	$357,000	$329,000	0.92
2	3,366,000	299,000	363,000	1.21
3	3,068,000	318,000	369,000	1.16
4	685,000	66,000	90,100	1.37
5	2,580,000	274,000	369,000	1.35

Alternative 1 - Buy-out Floodprone Properties

Alternative 2 - Raise Floodprone Properties

Alternative 3 - Channel Improvements of Coon Marsh Gully and Levee Improvements Along South Bank of Clemmons Gully

Alternative 4 - Channel Improvements of Coon Marsh Gully

Alternative 5 - Channel Improvements of Coon Marsh Gully and Levee and Diversion Channel Improvements Along North Bank of Clemmons Gully

SECTION V

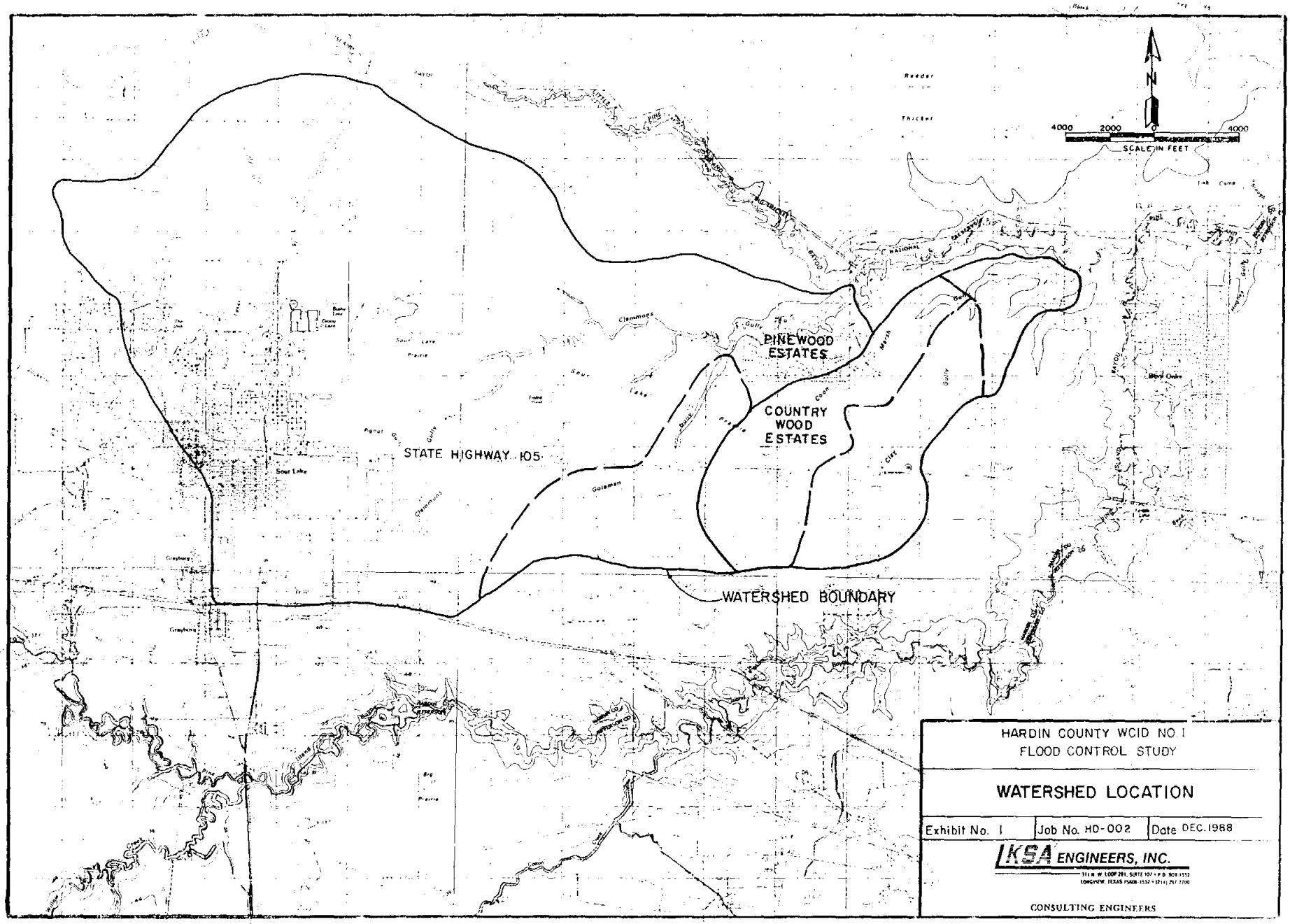
CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

1. House flooding problems within Pinewood Estates and Country Wood Estates are due primarily to: a) overbank flooding of Coon Marsh Gully, b) overbank flooding of Little Pine Island Bayou, and c) backwater flooding of Clemmons Gully caused by Little Pine Island Bayou.
2. During the 100-year flood of Coon Marsh Gully, 15 houses are subject to flooding (6 houses in Pinewood Estates and 9 houses in Country Wood Estates).
3. During the 100-year flood of Little Pine Island Bayou, 36 houses in Pinewood Estates are subject to flooding (30 due to backwater flooding along Clemmons Gully and 6 due to overbank flooding of Little Pine Island Bayou).
4. Average annual flood damage to residential structures in Pinewood Estates and Country Wood Estates is estimated to be $162,000.
5. Of 5 alternatives investigated herein to reduce flood damages, a system of channel improvements to Coon Marsh Gully and levee improvements north of Clemmons Gully (Alternative 5) provides the greatest average annual benefit and a relatively high benefit-cost ratio. The estimated capital and annual costs of Alternative 5 are $2,580,000 and $274,000, respectively, while the estimated average annual benefit is $369,000.

RECOMMENDATIONS

1. Based on the economic comparison of alternatives presented herein, it is recommended that Alternative 5 be implemented to alleviate house flooding problems in Pinewood Estates and Country wood Estates.
2. To insure adequate hydraulic capacity is provided by the new bridge proposed for Woodway Blvd. across Little Pine Island Bayou, the bridge opening recommended in Section IV of this report should be provided, as a minimum.
3. Drainage design standards for future home building and subdivision development, as outlined in Section IV of this report, should be adopted and strictly enforced.
4. Prior to implementation of any proposed improvements, these improvements shall be coordinated with and cleared through the Texas Antiquities Committee.
5. Prior to implementation of any proposed improvements along Coon Marsh Gully or Clemmons Gully, the Corps of Engineers should be contacted to determine if Section 404 or Section 10 permits are required.



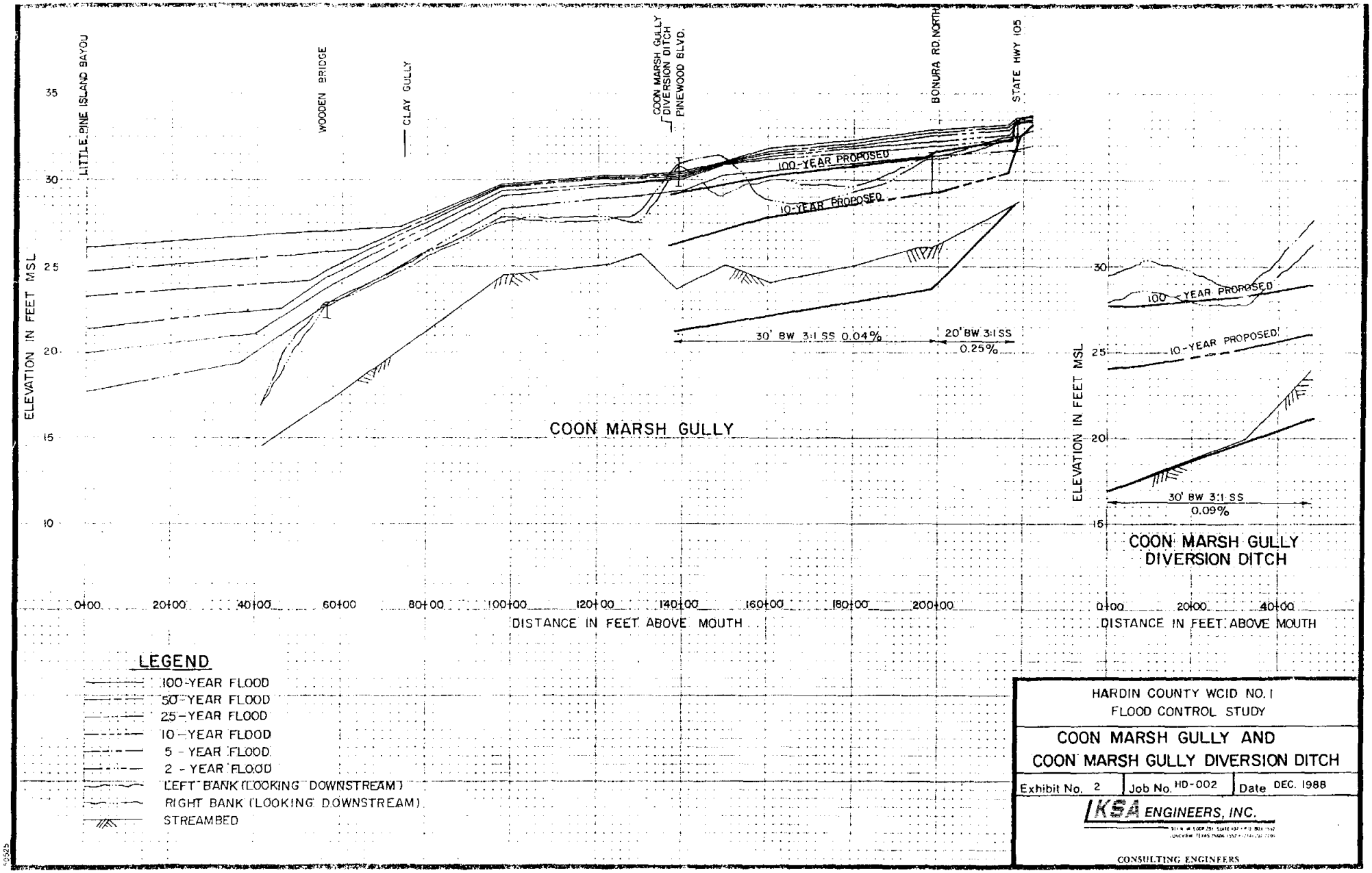
HARDIN COUNTY WCID NO 1
FLOOD CONTROL STUDY

WATERSHED LOCATION

Exhibit No. 1	Job No. HD-002	Date DEC. 1988

LKSA ENGINEERS, INC.

CONSULTING ENGINEERS



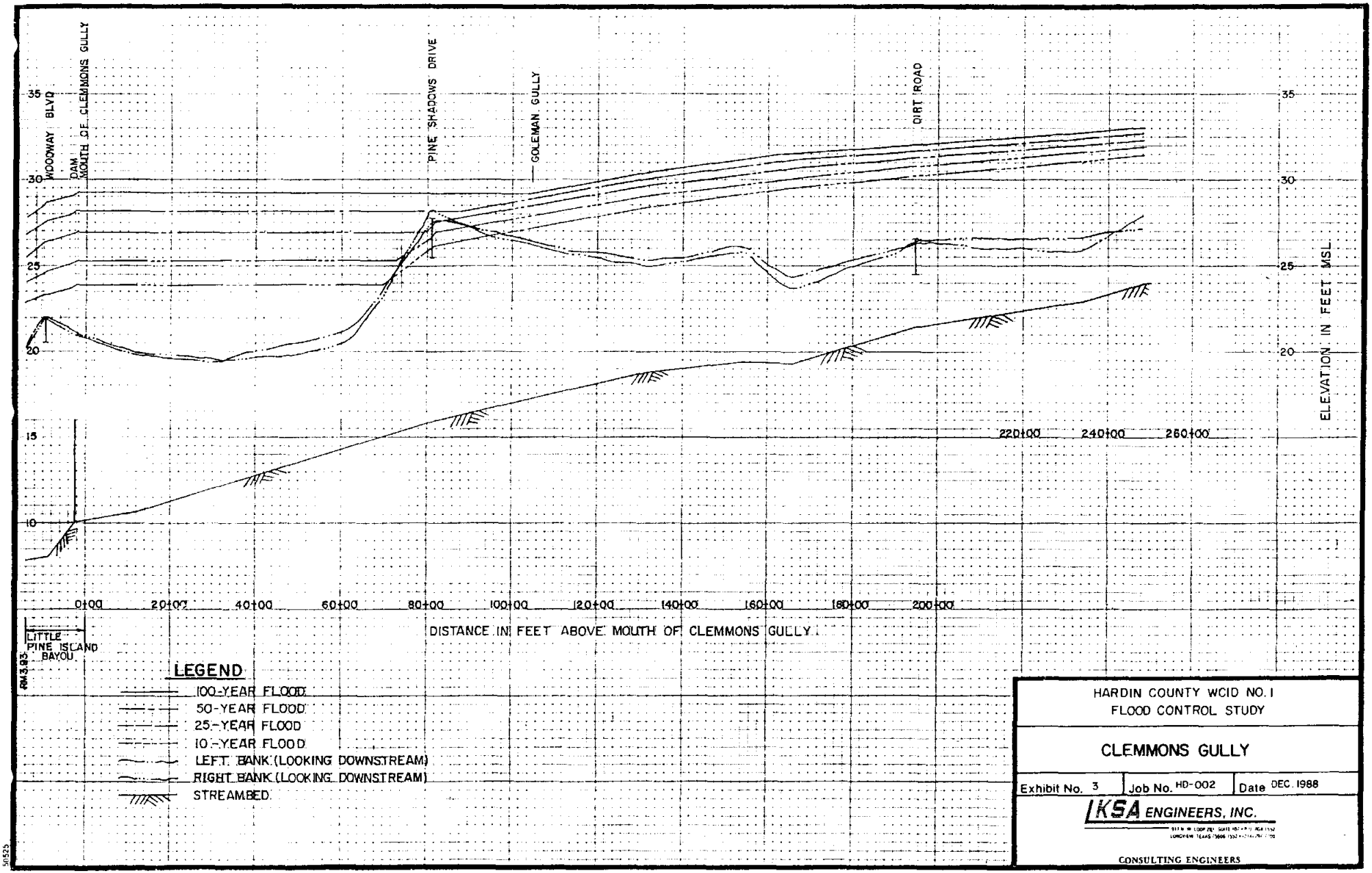
HARDIN COUNTY WCID NO. 1
FLOOD CONTROL STUDY

COON MARSH GULLY AND COON MARSH GULLY DIVERSION DITCH

Exhibit No. 2 | Job No. HD-002 | Date DEC. 1988

KSA ENGINEERS, INC.

CONSULTING ENGINEERS



HARDIN COUNTY WCID NO. 1
FLOOD CONTROL STUDY

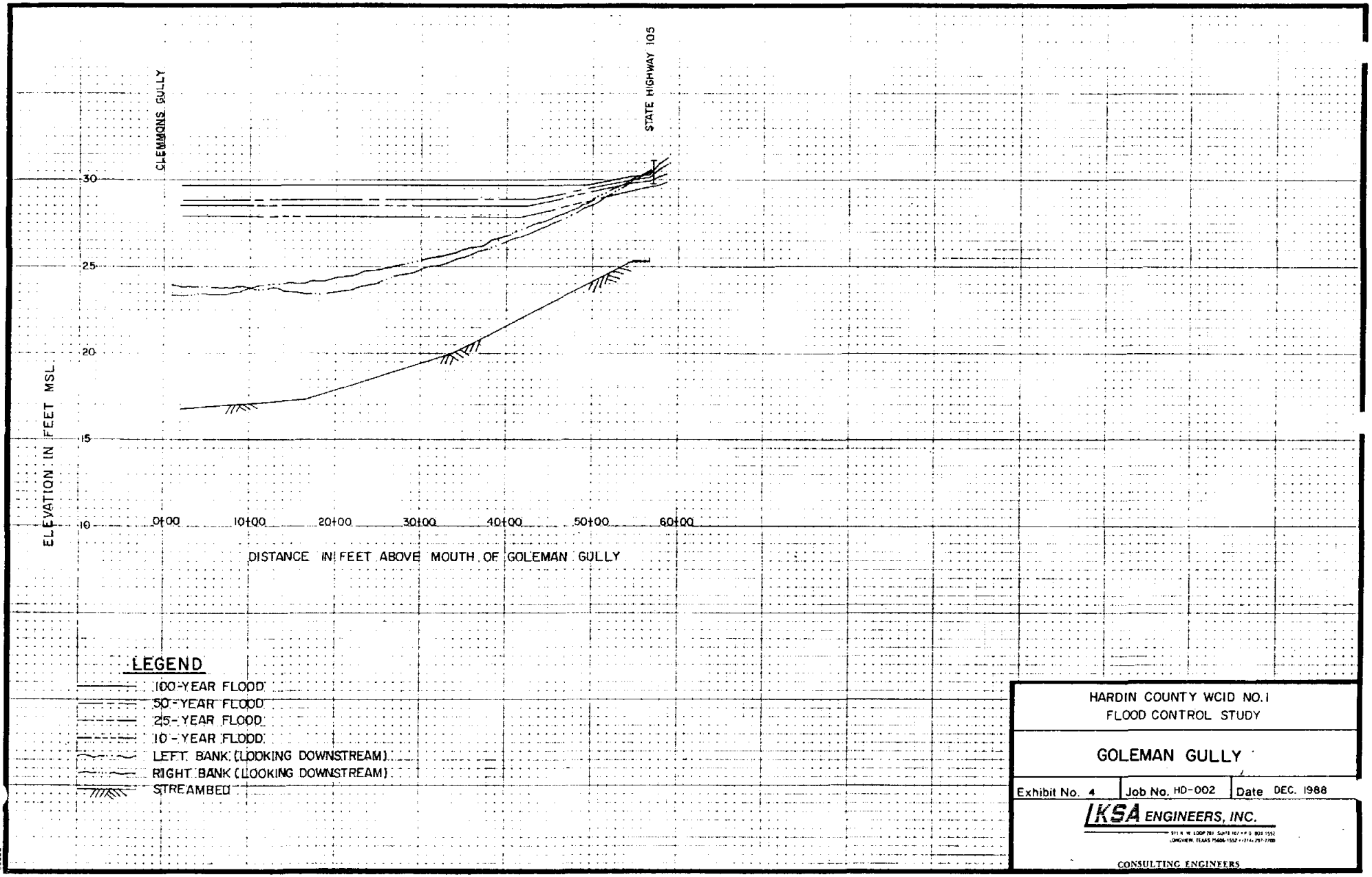
CLEMMONS GULLY

Exhibit No. 3	Job No. HD-002	Date DEC. 1988

KSA ENGINEERS, INC.

CONSULTING ENGINEERS

50529



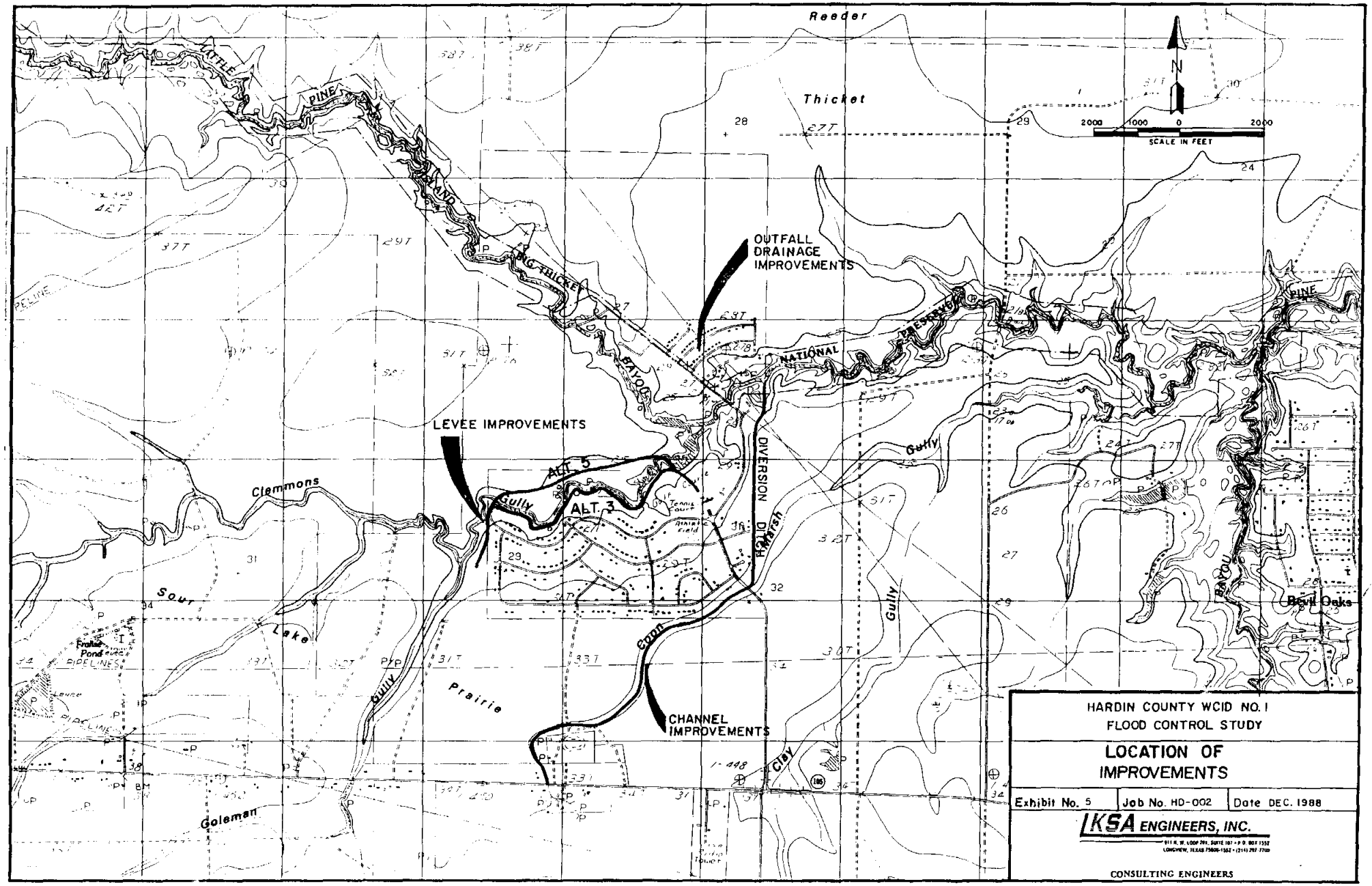
HARDIN COUNTY WCID NO.1
FLOOD CONTROL STUDY

GOLEMAN GULLY

Exhibit No. 4 | Job No. HD-002 | Date DEC. 1988

LKSA ENGINEERS, INC.
911 N. W. LOOP 281, Suite 107 • P. O. Box 1552
LONGVIEW, TEXAS 75606-1552 • (214) 297-7700
CONSULTING ENGINEERS

50525

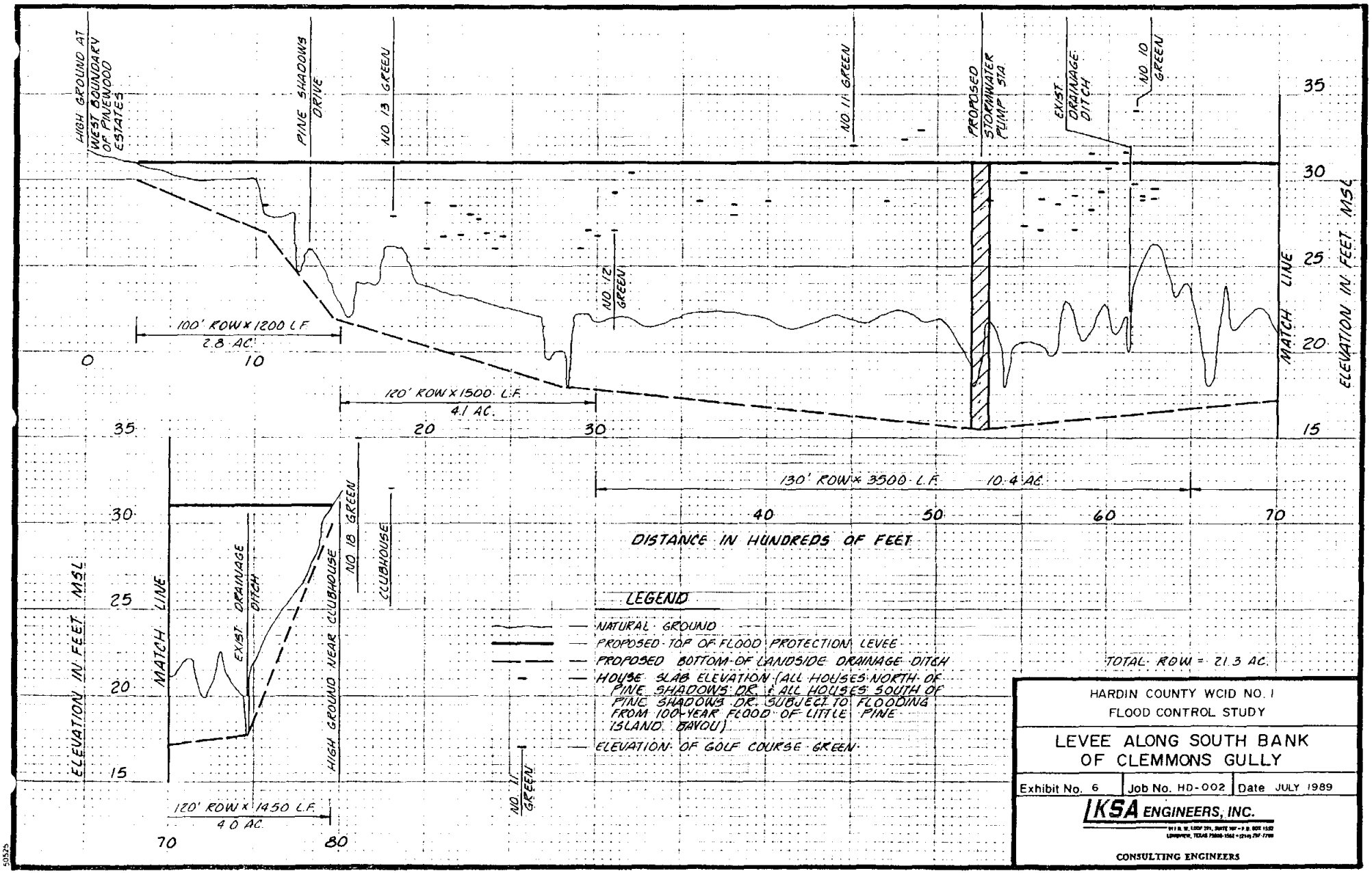


HARDIN COUNTY WCID NO. 1
FLOOD CONTROL STUDY

LOCATION OF IMPROVEMENTS

Exhibit No. 5	Job No. HD-002	Date DEC. 1988

LKSA ENGINEERS, INC.
911 N. W. Loop 281, Suite 107 • P. O. Box 1552
Longview, Texas 75606-1552 • (214) 297-7700
CONSULTING ENGINEERS



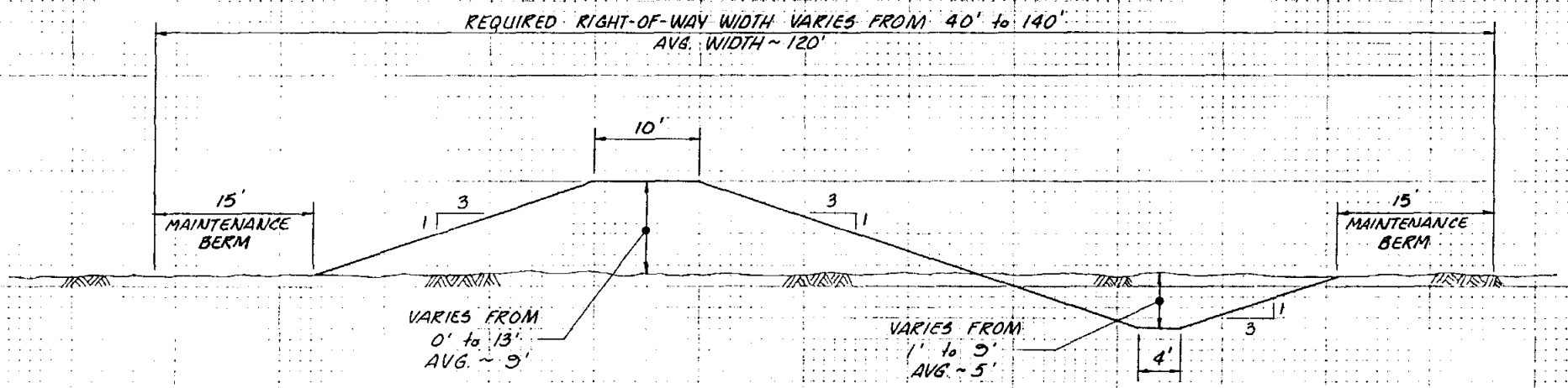
HARDIN COUNTY WCID NO. 1
FLOOD CONTROL STUDY

LEVEE ALONG SOUTH BANK OF CLEMMONS GULLY

Exhibit No. 6 | Job No. HD-002 | Date JULY 1989

KSA ENGINEERS, INC.
CONSULTING ENGINEERS

50525



HARDIN COUNTY WCID NO. 1
FLOOD CONTROL STUDY

TYPICAL SECTION OF LEVEE

Exhibit No. 7	Job No. HD-002	Date JULY 1989

KSA ENGINEERS, INC.
CONSULTING ENGINEERS

30525

APPENDIX 1

HEC-1 COMPUTER MODEL OF COON MARSH GULLY

1 ****

FLOOD HYDROGRAPH PACKAGE HEC-1 (IBM XT 512K VERSION) -FEB 1,1985
U.S. ARMY CORPS OF ENGINEERS, THE HYDROLOGIC ENGINEERING CENTER, 609 SECOND STREET, DAVIS, CA. 95616
****

THIS HEC-1 VERSION CONTAINS ALL OPTIONS EXCEPT ECONOMICS, AND THE NUMBER OF PLANS ARE REDUCED TO 3

1 HEC-1 INPUT PAGE 1

```
      LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

        1           ID   HARDIN COUNTY MCID NO. 1  JOB NO. HD-002  AUG. 88  MRD  FILE CMG100
        2           ID   COON MARSH GULLEY
        3           ID   100-YEAR FLOOD
*** FREE ***
        4           IT    30                    48
        5           IO     3

        6           KK   SUB1
        7           KM   SUBAREA OF COON MARSH GULLEY ABOVE HIGHWAY 105
        8           KM   DRAINAGE AREA OF 0.85 SQUARE MILES
        9           BA   0.85
       10           IN    60
       11           PH     1      0   0.90   2.02   4.65   6.10   6.90   8.70  10.80  12.90
       12           LU     0   0.05
       13           US  3.00   0.45

       14           KK   ROUTE
       15           RT  3.54      2

       16           KK   SUB2
       17           KM   SUBAREA COON MARSH GULLEY BETWEEN HIGHWAY 105 AND CONFLUENCE OF
       18           KM        COON MARSH GULLEY AND DIVERSION DITCH
       19           KM   DRAINAGE AREA OF 0.90 SQUARE MILES
       20           BA   0.90
       21           US   4.65   0.45

       22           KK   TOTAL
       23           KM   COMBINE HYDROGRAPHS FROM SUB1 & SUB2
       24           HC     2

       25           KK   ROUTE
       26           RT  2.61      2

       27           KK   SUB3
       28           KM   SUBAREA BETWEEN DIVERSION DITCH AND CLAY GULLEY
       29           KM   DRAINAGE AREA OF 0.41 SQUARE MILES
```

```
30          BA   0.41
31          US   3.77    0.45

32          KK   TOTAL
33          KM   COMBINE HYDROGRAPHS FROM SUB1, SUB2, & SUB3
34          HC     2

35          KK   SUB4
36          KM   SUBAREA OF CLAY GULLEY ABOVE HIGHWAY 105
37          KM   DRAINAGE AREA OF 0.76 SQUARE MILES
38          BA   0.76
39          US   2.99    0.45

40          KK   ROUTE
41          RT   4.04      2
```



```
LINE        ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

42          KK   SUB5
43          KM   SUBAREA OF CLAY GULLEY BETWEEN HIGHWAY 105 AND CONFLUENCE WITH
44          KM        COON MARSH GULLEY
45          KM   DRAINAGE AREA OF 0.88 SQUARE MILES
46          BA   0.88
47          US   5.17    0.45

48          KK   TOTAL
49          KM   COMBINE HYDROGRAPHS FROM SUB1, SUB2, SUB3, SUB4, & SUB5
50          HC     3

51          KK   ROUTE
52          RT   3.14      2

53          KK   SUB6
54          KM   SUBAREA OF COON MARSH BETWEEN CLAY GULLEY AND LITTLE PINE ISLAND BAYOU
55          KM   DRAINAGE AREA OF 0.67 SQUARE MILES
56          BA   0.67
57          US   4.64    0.45

58          KK   TOTAL
59          KM   COMBINE HYDROGRAPHS FROM SUB1, SUB2, SUB3, SUB4, SUB5, & SUB6
60          HC     2
61          ZZ
```

1 ****

FLOOD HYDROGRAPH PACKAGE HEC-1 (IBM XT 512K VERSION) -FEB 1,1985
U.S. ARMY CORPS OF ENGINEERS, THE HYDROLOGIC ENGINEERING CENTER, 609 SECOND STREET, DAVIS, CA. 95616
****

HARDIN COUNTY MCID NO. 1 JOB NO. HD-002 AUG. 88 MRD FILE CMG100
COON MARSH GULLEY
100-YEAR FLOOD

5 IO OUTPUT CONTROL VARIABLES
IPRNT 3 PRINT CONTROL
IPLOT 0 PLOT CONTROL
QSCAL 0. HYDROGRAPH PLOT SCALE

IT HYDROGRAPH TIME DATA
NMIN 30 MINUTES IN COMPUTATION INTERVAL
IDATE 1 0 STARTING DATE
ITIME 0000 STARTING TIME
NQ 48 NUMBER OF HYDROGRAPH ORDINATES
NDDATE 1 0 ENDING DATE
NDTIME 2330 ENDING TIME

COMPUTATION INTERVAL .50 HOURS
TOTAL TIME BASE 23.50 HOURS

ENGLISH UNITS

*** ***

****
* *
6 KK * SUB1 *
* *
****

SUBAREA OF COON MARSH GULLEY ABOVE HIGHWAY 105
DRAINAGE AREA OF 0.85 SQUARE MILES

SUBBASIN RUNOFF DATA

9 BA SUBBASIN CHARACTERISTICS
TAREA .85 SUBBASIN AREA

PRECIPITATION DATA

11 PH DEPTHS FOR 1-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.90	2.02	4.65	6.10	6.90	8.70	10.80	12.90	.00	.00	.00	.00

STORM AREA = .85

12 LU UNIFORM LOSS RATE
STRTL .00 INITIAL LOSS
CNSTL .05 UNIFORM LOSS RATE
RTIMP .00 PERCENT IMPERVIOUS AREA

13 US SNYDER UNITGRAPH
TP 3.00 LAG
CP .45 PEAKING COEFFICIENT

SYNTHETIC ACCUMULATED-AREA VS. TIME CURVE WILL BE USED

***

UNIT HYDROGRAPH PARAMETERS
CLARK TC 3.22 HR R 4.71 HR
SNYDER TP 3.02 HR CP .45

UNIT HYDROGRAPH
54 END-OF-PERIOD ORDINATES

5.	18.	36.	56.	72.	82.	82.	75.	68.	61.
55.	49.	44.	40.	36.	32.	29.	26.	23.	21.
19.	17.	15.	14.	12.	11.	10.	9.	8.	7.
7.	6.	5.	5.	4.	4.	3.	3.	3.	3.
2.	2.	2.	2.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.						

*** *** *** *** ***

HYDROGRAPH AT STATION SUB1

TOTAL RAINFALL = 12.82, TOTAL LOSS = 1.17, TOTAL EXCESS = 11.64

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	23.50-HR
+	(CFS)	(HR)					
			(CFS)				
+	634.	15.00		527.	229.	229.	229.
			(INCHES)	5.761	9.806	9.806	9.806
			(AC-FT)	261.	445.	445.	445.

CUMULATIVE AREA = .85 SQ MI

*** ***

****
* *
14 KK * ROUTE *
* *
****

HYDROGRAPH ROUTING DATA

15 RT TATUM OR STRADDLE-STAGGER ROUTING

NSTPS	3	NUMBER OF TATUM STEPS
NSTDL	2	NUMBER OF ORDINATES TO BE AVERAGED
LAG	0	NUMBER OF INTERVALS TO LAG HYDROGRAPH

***

*** *** *** *** ***

HYDROGRAPH AT STATION ROUTE

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	23.50-HR
+	(CFS)	(HR)					
			(CFS)				
+	623.	15.50		522.	222.	222.	222.
			(INCHES)	5.708	9.518	9.518	9.518
			(AC-FT)	259.	431.	431.	431.

CUMULATIVE AREA = .85 SQ MI

*** ***

```
          **************
          *            *
16 KK     *     SUB2   *
          *            *
          **************
```

SUBAREA COON MARSH GULLEY BETWEEN HIGHWAY 105 AND CONFLUENCE OF
COON MARSH GULLEY AND DIVERSION DITCH
DRAINAGE AREA OF 0.90 SQUARE MILES

SUBBASIN RUNOFF DATA

20 BA SUBBASIN CHARACTERISTICS

TAREA	.90	SUBBASIN AREA

PRECIPITATION DATA

11 PH DEPTHS FOR 1-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.90	2.02	4.65	6.10	6.90	8.70	10.80	12.90	.00	.00	.00	.00

STORM AREA = .90

12 LU UNIFORM LOSS RATE

STRTL	.00	INITIAL LOSS
CNSTL	.05	UNIFORM LOSS RATE
RTIMP	.00	PERCENT IMPERVIOUS AREA

21 US SNYDER UNITGRAPH

TP	4.65	LAG
CP	.45	PEAKING COEFFICIENT

SYNTHETIC ACCUMULATED-AREA VS. TIME CURVE WILL BE USED

***

UNIT HYDROGRAPH PARAMETERS
CLARK TC 4.94 HR R 7.35 HR
SNYDER TP 4.68 HR CP .45

UNIT HYDROGRAPH
83 END-OF-PERIOD ORDINATES

2.	7.	13.	22.	30.	39.	47.	53.	56.	57.
55.	51.	48.	45.	42.	39.	37.	34.	32.	30.
28.	26.	24.	23.	21.	20.	18.	17.	16.	15.
14.	13.	12.	11.	11.	10.	9.	9.	8.	8.
7.	7.	6.	6.	5.	5.	5.	4.	4.	4.
4.	3.	3.	3.	3.	3.	2.	2.	2.	2.
2.	2.	2.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
0.	0.	0.							

*** *** *** *** ***

HYDROGRAPH AT STATION SUB2

TOTAL RAINFALL = 12.81, TOTAL LOSS = 1.17, TOTAL EXCESS = 11.64

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	23.50-HR
+ (CFS)	(HR)					
		(CFS)				
+ 489.	16.50		439.	196.	196.	196.
		(INCHES)	4.532	7.950	7.950	7.950
		(AC-FT)	218.	382.	382.	382.

CUMULATIVE AREA = .90 SQ MI

*** ***

```
          **************
          *            *
22 KK     *    TOTAL   *
          *            *
          **************
```

COMBINE HYDROGRAPHS FROM SUB1 & SUB2

24 HC HYDROGRAPH COMBINATION
ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

***

*** *** *** *** ***

HYDROGRAPH AT STATION TOTAL

PEAK FLOW TIME MAXIMUM AVERAGE FLOW

				6-HR	24-HR	72-HR	23.50-HR
+	(CFS)	(HR)					
			(CFS)				
+	1100.	16.00		958.	419.	419.	419.
			(INCHES)	5.089	8.712	8.712	8.712
			(AC-FT)	475.	813.	813.	813.

CUMULATIVE AREA = 1.75 SQ MI

*** ***

```
          *************
          *           *
   25 KK  *   ROUTE   *
          *           *
          *************
```

HYDROGRAPH ROUTING DATA

```
   26 RT        TATUM OR STRADDLE-STAGGER ROUTING
                    NSTPS           2   NUMBER OF TATUM STEPS
                    NSTDL           2   NUMBER OF ORDINATES TO BE AVERAGED
                    LAG             0   NUMBER OF INTERVALS TO LAG HYDROGRAPH
```

***

*** *** *** *** ***

HYDROGRAPH AT STATION ROUTE

PEAK FLOW		TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	23.50-HR
+	(CFS)	(HR)					
			(CFS)				
+	1091.	16.50		954.	408.	408.	408.
			(INCHES)	5.068	8.484	8.484	8.484
			(AC-FT)	473.	792.	792.	792.

CUMULATIVE AREA = 1.75 SQ MI

*** ***

```
          *************
          *           *
   27 KK  *    SUB3   *
          *           *
          *************
```

SUBAREA BETWEEN DIVERSION DITCH AND CLAY GULLEY
DRAINAGE AREA OF 0.41 SQUARE MILES

SUBBASIN RUNOFF DATA

30 BA SUBBASIN CHARACTERISTICS

TAREA	.41	SUBBASIN AREA

PRECIPITATION DATA

11 PH DEPTHS FOR 1-PERCENT HYPOTHETICAL STORM

HYDRO-35			TP-40					TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.90	2.02	4.65	6.10	6.90	8.70	10.80	12.90	.00	.00	.00	.00

STORM AREA = .41

12 LU UNIFORM LOSS RATE

STRTL	.00	INITIAL LOSS
CNSTL	.05	UNIFORM LOSS RATE
RTIMP	.00	PERCENT IMPERVIOUS AREA

31 US SNYDER UNITGRAPH

TP	3.77	LAG
CP	.45	PEAKING COEFFICIENT

SYNTHETIC ACCUMULATED-AREA VS. TIME CURVE WILL BE USED

***

UNIT HYDROGRAPH PARAMETERS
CLARK TC 3.98 HR R 6.01 HR
SNYDER TP 3.77 HR CP .45

UNIT HYDROGRAPH
68 END-OF-PERIOD ORDINATES

1.	5.	10.	16.	22.	27.	31.	32.	31.	28.
26.	24.	22.	20.	19.	17.	16.	14.	13.	12.
11.	10.	10.	9.	8.	7.	7.	6.	6.	5.
5.	5.	4.	4.	4.	3.	3.	3.	3.	2.
2.	2.	2.	2.	2.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	0.	0.
0.	0.	0.	0.	0.	0.	0.	0.		

*** *** *** *** ***

HYDROGRAPH AT STATION SUB3

TOTAL RAINFALL = 12.82, TOTAL LOSS = 1.17, TOTAL EXCESS = 11.65

	PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	23.50-HR
+	(CFS)	(HR)	(CFS)			
+	259.	15.50	225.	100.	100.	100.

(INCHES)	5.102	8.908	8.908	8.908
(AC-FT)	112.	195.	195.	195.

CUMULATIVE AREA = .41 SQ MI

*** ***

```
        *************
        *           *
32 KK   *   TOTAL   *
        *           *
        *************
```

COMBINE HYDROGRAPHS FROM SUB1, SUB2, & SUB3

34 HC HYDROGRAPH COMBINATION

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

***

*** *** *** *** ***

HYDROGRAPH AT STATION TOTAL

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	23.50-HR
+ (CFS)	(HR)					
		(CFS)				
+ 1337.	16.50		1173.	508.	508.	508.
		(INCHES)	5.051	8.565	8.565	8.565
		(AC-FT)	582.	987.	987.	987.

CUMULATIVE AREA = 2.16 SQ MI

*** ***

```
        *************
        *           *
35 KK   *    SUB4   *
        *           *
        *************
```

SUBAREA OF CLAY GULLEY ABOVE HIGHWAY 105
DRAINAGE AREA OF 0.76 SQUARE MILES

SUBBASIN RUNOFF DATA

38 BA SUBBASIN CHARACTERISTICS

TAREA .76 SUBBASIN AREA

```
*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

           **************
           *            *
   40 KK   *    ROUTE   *
           *            *
           **************

             HYDROGRAPH ROUTING DATA

   41 RT          TATUM OR STRADDLE-STAGGER ROUTING
                       NSTPS            4   NUMBER OF TATUM STEPS
                       NSTDL            2   NUMBER OF ORDINATES TO BE AVERAGED
                       LAG              0   NUMBER OF INTERVALS TO LAG HYDROGRAPH

                                                                 ***

       ***             ***             ***             ***             ***

                        HYDROGRAPH AT STATION     ROUTE

   PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                       6-HR        24-HR        72-HR       23.50-HR
 +   (CFS)       (HR)
                           (CFS)
 +     556.     16.00                  467.         197.         197.         197.
                         (INCHES)     5.714        9.430        9.430        9.430
                          (AC-FT)      232.         382.         382.         382.

                         CUMULATIVE AREA =       .76 SQ MI


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***

           **************
           *            *
   42 KK   *     SUB5   *
           *            *
           **************
                           SUBAREA OF CLAY GULLEY BETWEEN HIGHWAY 105 AND CONFLUENCE WITH
                              COON MARSH GULLEY
                           DRAINAGE AREA OF 0.88 SQUARE MILES

              SUBBASIN RUNOFF DATA

   46 BA          SUBBASIN CHARACTERISTICS
                       TAREA         .88  SUBBASIN AREA

                PRECIPITATION DATA

   11 PH                               DEPTHS FOR   1-PERCENT HYPOTHETICAL STORM
```

PRECIPITATION DATA

11 PH

DEPTHS FOR 1-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.90	2.02	4.65	6.10	6.90	8.70	10.80	12.90	.00	.00	.00	.00

STORM AREA = .76

12 LU UNIFORM LOSS RATE

STRTL	.00	INITIAL LOSS
CNSTL	.05	UNIFORM LOSS RATE
RTIMP	.00	PERCENT IMPERVIOUS AREA

39 US SNYDER UNITGRAPH

TP	2.99	LAG
CP	.45	PEAKING COEFFICIENT

SYNTHETIC ACCUMULATED-AREA VS. TIME CURVE WILL BE USED

***

UNIT HYDROGRAPH PARAMETERS

CLARK TC 3.21 HR R 4.69 HR

SNYDER TP 3.01 HR CP .45

UNIT HYDROGRAPH

54 END-OF-PERIOD ORDINATES

4.	16.	33.	50.	65.	74.	74.	67.	60.	54.
49.	44.	39.	35.	32.	29.	26.	23.	21.	19.
17.	15.	14.	12.	11.	10.	9.	8.	7.	6.
6.	5.	5.	4.	4.	3.	3.	3.	2.	2.
2.	2.	2.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	0.						

*** *** *** *** ***

HYDROGRAPH AT STATION SUB4

TOTAL RAINFALL = 12.82, TOTAL LOSS = 1.17, TOTAL EXCESS = 11.64

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	23.50-HR
+	(CFS)	(HR)					
			(CFS)				
+	569.	15.00		472.	205.	205.	205.
			(INCHES)	5.773	9.821	9.821	9.821
			(AC-FT)	234.	398.	398.	398.

CUMULATIVE AREA = .76 SQ MI

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.90	2.02	4.65	6.10	6.90	8.70	10.80	12.90	.00	.00	.00	.00

STORM AREA = .88

12 LU UNIFORM LOSS RATE

STRTL	.00	INITIAL LOSS
CNSTL	.05	UNIFORM LOSS RATE
RTIMP	.00	PERCENT IMPERVIOUS AREA

47 US SNYDER UNITGRAPH

TP	5.17	LAG
CP	.45	PEAKING COEFFICIENT

SYNTHETIC ACCUMULATED-AREA VS. TIME CURVE WILL BE USED

***

UNIT HYDROGRAPH PARAMETERS

CLARK TC 5.48 HR R 8.17 HR

SNYDER TP 5.20 HR CP .45

UNIT HYDROGRAPH

93 END-OF-PERIOD ORDINATES

1.	5.	10.	16.	23.	31.	37.	43.	47.	50.
51.	49.	46.	43.	41.	38.	36.	34.	32.	30.
28.	26.	25.	23.	22.	21.	19.	18.	17.	16.
15.	14.	13.	13.	12.	11.	11.	10.	9.	9.
8.	8.	7.	7.	6.	6.	6.	5.	5.	5.
4.	4.	4.	4.	4.	3.	3.	3.	3.	3.
2.	2.	2.	2.	2.	2.	2.	2.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	0.	0.	0.	0.
0.	0.	0.							

*** *** *** *** ***

HYDROGRAPH AT STATION SUB5

TOTAL RAINFALL = 12.82, TOTAL LOSS = 1.17, TOTAL EXCESS = 11.64

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	23.50-HR
+	(CFS)	(HR)					
			(CFS)				
+	442.	17.00		402.	179.	179.	179.
			(INCHES)	4.246	7.418	7.418	7.418
			(AC-FT)	199.	348.	348.	348.

CUMULATIVE AREA = .88 SQ MI

*** ***

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          **************
          *            *
 48 KK    *    TOTAL   *
          *            *
          **************
                    COMBINE HYDROGRAPHS FROM SUB1, SUB2, SUB3, SUB4, & SUB5

 50 HC          HYDROGRAPH COMBINATION
                     ICOMP          3  NUMBER OF HYDROGRAPHS TO COMBINE

                                                          ***

     ***            ***            ***            ***            ***

                       HYDROGRAPH AT STATION    TOTAL

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
                                      6-HR       24-HR       72-HR      23.50-HR
+   (CFS)       (HR)
                          (CFS)
+    2316.      16.50                2036.        884.        884.        884.
                         (INCHES)    4.981       8.472       8.472       8.472
                         (AC-FT)     1009.       1717.       1717.       1717.

                       CUMULATIVE AREA =    3.80 SQ MI
```

*** ***

```
          **************
          *            *
 51 KK    *    ROUTE   *
          *            *
          **************

            HYDROGRAPH ROUTING DATA

 52 RT          TATUM OR STRADDLE-STAGGER ROUTING
                     NSTPS          3  NUMBER OF TATUM STEPS
                     NSTDL          2  NUMBER OF ORDINATES TO BE AVERAGED
                     LAG            0  NUMBER OF INTERVALS TO LAG HYDROGRAPH

                                                          ***

     ***            ***            ***            ***            ***

                       HYDROGRAPH AT STATION    ROUTE

  PEAK FLOW     TIME                          MAXIMUM AVERAGE FLOW
```

				6-HR	24-HR	72-HR	23.50-HR
+	(CFS)	(HR)					
			(CFS)				
+	2292.	17.00		2026.	846.	846.	846.
			(INCHES)	4.958	8.111	8.111	8.111
			(AC-FT)	1005.	1644.	1644.	1644.

CUMULATIVE AREA = 3.80 SQ MI

*** ***

```
          **************
          *            *
53 KK     *     SUB6   *
          *            *
          **************
```

SUBAREA OF COON MARSH BETWEEN CLAY GULLEY AND LITTLE PINE ISLAND BAYOU
DRAINAGE AREA OF 0.67 SQUARE MILES

SUBBASIN RUNOFF DATA

56 BA SUBBASIN CHARACTERISTICS

TAREA	.67	SUBBASIN AREA

PRECIPITATION DATA

11 PH DEPTHS FOR 1-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.90	2.02	4.65	6.10	6.90	8.70	10.80	12.90	.00	.00	.00	.00

STORM AREA = .67

12 LU UNIFORM LOSS RATE

STRTL	.00	INITIAL LOSS
CNSTL	.05	UNIFORM LOSS RATE
RTIMP	.00	PERCENT IMPERVIOUS AREA

57 US SNYDER UNITGRAPH

TP	4.64	LAG
CP	.45	PEAKING COEFFICIENT

SYNTHETIC ACCUMULATED-AREA VS. TIME CURVE WILL BE USED

***

UNIT HYDROGRAPH PARAMETERS

CLARK TC 4.94 HR R 7.33 HR
SNYDER TP 4.67 HR CP .45

UNIT HYDROGRAPH

83 END-OF-PERIOD ORDINATES

1.	5.	10.	16.	23.	30.	35.	39.	42.	43.
41.	38.	36.	33.	31.	29.	27.	25.	24.	22.
21.	19.	18.	17.	16.	15.	14.	13.	12.	11.
10.	10.	9.	9.	8.	7.	7.	6.	6.	6.
5.	5.	5.	4.	4.	4.	4.	3.	3.	3.
3.	2.	2.	2.	2.	2.	2.	2.	2.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	0.	0.	0.	0.	0.
0.	0.	0.							

*** *** *** *** ***

HYDROGRAPH AT STATION SUB6

TOTAL RAINFALL = 12.82, TOTAL LOSS = 1.17, TOTAL EXCESS = 11.64

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	23.50-HR
+	(CFS)	(HR)					
			(CFS)				
+	365.	16.50		327.	147.	147.	147.
			(INCHES)	4.541	7.965	7.965	7.965
			(AC-FT)	162.	285.	285.	285.

CUMULATIVE AREA = .67 SQ MI

*** ***

58 KK TOTAL

COMBINE HYDROGRAPHS FROM SUB1, SUB2, SUB3, SUB4, SUB5, & SUB6

60 HC HYDROGRAPH COMBINATION

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

***

*** *** *** *** ***

HYDROGRAPH AT STATION TOTAL

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	23.50-HR
+	(CFS)	(HR)					
			(CFS)				
+	2651.	17.00		2351.	993.	993.	993.
			(INCHES)	4.889	8.089	8.089	8.089

		(AC-FT)	1166.		1928.		1928.		1928.	

CUMULATIVE AREA = 4.47 SQ MI

1

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

	OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD			BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
+					6-HOUR	24-HOUR	72-HOUR			
+	HYDROGRAPH AT	SUB1	634.	15.00	527.	229.	229.	.85		
+	ROUTED TO	ROUTE	623.	15.50	522.	222.	222.	.85		
+	HYDROGRAPH AT	SUB2	489.	16.50	439.	196.	196.	.90		
+	2 COMBINED AT	TOTAL	1100.	16.00	958.	419.	419.	1.75		
+	ROUTED TO	ROUTE	1091.	16.50	954.	408.	408.	1.75		
+	HYDROGRAPH AT	SUB3	259.	15.50	225.	100.	100.	.41		
+	2 COMBINED AT	TOTAL	1337.	16.50	1173.	508.	508.	2.16		
+	HYDROGRAPH AT	SUB4	569.	15.00	472.	205.	205.	.76		
+	ROUTED TO	ROUTE	556.	16.00	467.	197.	197.	.76		
+	HYDROGRAPH AT	SUB5	442.	17.00	402.	179.	179.	.88		
+	3 COMBINED AT	TOTAL	2316.	16.50	2036.	884.	884.	3.80		
+	ROUTED TO	ROUTE	2292.	17.00	2026.	846.	846.	3.80		
+	HYDROGRAPH AT	SUB6	365.	16.50	327.	147.	147.	.67		
+	2 COMBINED AT	TOTAL	2651.	17.00	2351.	993.	993.	4.47		

*** NORMAL END OF HEC-1 ***

XI	22142.000	11.000	1784.000	1821.000	200.000	200.000	200.000	.000	.000	.000
GR	30.100	1000.000	30.100	1500.000	32.200	1600.000	29.600	1700.000	29.500	1784.000
GR	28.700	1800.000	29.700	1821.000	29.700	1900.000	30.100	2000.000	30.500	2100.000
GR	30.500	2600.000	.000	.000	.000	.000	.000	.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

THIS RUN EXECUTED 07/16/89 16:42:11

```
########################################
 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
########################################


T1 HARDIN COUNTY WCID NO. 1 FLOOD STUDY              JOB HD-002  JULY 89  JNH
T2 EXISTING CONDITIONS 1-YEAR FLOOD                    COMPUTER FILE COONEX4
T3 COON MARSH GULLY   START AT NORMAL DEPTH   DIVERTED Q EXCLUDED (DD & PM DR.)

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

       0.      2.       0.       0.  .001800       .00      .0       0.   21.000     .000

J2  NPROF    IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    15.000     .000   -1.000     .000     .000     .000     .000     .000     .000     .000
```

THIS RUN EXECUTED 07/16/89 16:42:32

```
**********************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
**********************************************
```

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

MARSH GULLY START AT N

SUMMARY PRINTOUT

SECNO	Q	QLOB	QCH	QROB	ELTRD	CWSEL	CRIWS	EG	HV	HL	QLOSS	10K*S
4150.000	1720.00	558.82	628.71	532.46	.00	23.14	.00	23.27	.14	.00	.00	18.02
4150.000	1530.00	482.29	589.89	457.82	.00	22.86	.00	22.99	.14	.00	.00	18.02
4150.000	1310.00	393.85	543.04	373.11	.00	22.49	.00	22.63	.14	.00	.00	18.17
4150.000	980.00	264.36	461.58	254.06	.00	21.88	.00	22.02	.13	.00	.00	17.97
4150.000	770.00	184.61	401.76	183.63	.00	21.39	.00	21.52	.13	.00	.00	17.99
4150.000	410.00	62.58	276.18	71.23	.00	20.23	.00	20.35	.12	.00	.00	18.12
4150.000	300.00	34.51	225.26	40.23	.00	19.71	.00	19.83	.12	.00	.00	18.07
5700.000	1720.00	448.74	902.77	368.48	.00	25.42	.00	25.55	.13	2.27	.00	14.76
5700.000	1530.00	368.88	861.29	299.83	.00	25.17	.00	25.30	.13	2.31	.00	15.01
5700.000	1310.00	281.70	805.33	222.97	.00	24.84	.00	24.98	.13	2.35	.00	15.16
5700.000	980.00	156.63	708.57	114.80	.00	24.27	.00	24.41	.14	2.40	.00	15.44
5700.000	770.00	83.47	630.07	56.45	.00	23.81	.00	23.96	.15	2.44	.00	15.55
5700.000	410.00	.91	409.09	.00	.00	22.57	.00	22.69	.12	2.34	.00	13.46
5700.000	300.00	.00	300.00	.00	.00	21.88	.00	21.96	.08	2.13	.00	11.26
5701.000	1720.00	867.44	160.08	692.48	22.30	25.55	.00	25.58	.03	.00	.03	1.26
5701.000	1530.00	766.00	160.63	603.37	22.30	25.30	.00	25.33	.03	.00	.03	1.44
5701.000	1310.00	649.65	163.40	496.96	22.30	24.98	.00	25.01	.03	.00	.03	1.76
5701.000	980.00	473.18	175.89	330.92	22.30	24.41	.00	24.45	.03	.00	.03	2.83
5701.000	770.00	349.23	201.17	219.61	22.30	23.95	.00	23.99	.04	.00	.03	4.94
5701.000	410.00	5.70	404.30	.00	22.30	22.54	.00	22.73	.19	.00	.04	30.76
5701.000	300.00	.00	300.00	.00	22.30	21.87	.00	21.98	.11	.00	.01	12.63
5719.000	1720.00	867.57	159.44	692.98	22.30	25.55	.00	25.58	.03	.00	.00	1.24
5719.000	1530.00	766.23	159.92	603.85	22.30	25.31	.00	25.34	.03	.00	.00	1.42
5719.000	1310.00	649.83	162.56	497.62	22.30	24.98	.00	25.01	.03	.00	.00	1.74
5719.000	980.00	473.54	174.52	331.94	22.30	24.42	.00	24.45	.03	.01	.00	2.77
5719.000	770.00	350.24	198.18	221.58	22.30	23.96	.00	24.00	.04	.01	.00	4.74
5719.000	410.00	10.53	399.46	.00	22.30	22.60	.00	22.79	.19	.05	.00	30.03
5719.000	300.00	.00	300.00	.00	22.30	21.89	.00	22.00	.11	.02	.00	12.55

APPENDIX 2

HEC-1 COMPUTER MODEL OF CLEMMONS AND GOLEMAN GULLIES

1 ****

FLOOD HYDROGRAPH PACKAGE HEC-1 (IBM XT 512K VERSION) -FEB 1,1985
U.S. ARMY CORPS OF ENGINEERS, THE HYDROLOGIC ENGINEERING CENTER, 609 SECOND STREET, DAVIS, CA. 95616
****

THIS HEC-1 VERSION CONTAINS ALL OPTIONS EXCEPT ECONOMICS, AND THE NUMBER OF PLANS ARE REDUCED TO 3

1 HEC-1 INPUT PAGE 1

```
      LINE        ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

        1         ID   HARDIN COUNTY MCID NO. 1  JOB NO. HD-002   AUG. 88   MRD  FILE CLEM100
        2         ID   CLEMMONS GULLEY
        3         ID   100-YEAR FLOOD
*** FREE ***
        4         IT     30                    96
        5         IO      3

        6         KK   SUB1
        7         KM   SUBAREA GOLEMAN GULLEY ABOVE HWY 105
        8         KM   DRAINAGE AREA OF 1.23 SQUARE MILES
        9         BA   1.23
       10         IN     60
       11         PH      1       0    0.90    2.02    4.65    6.10    6.90    8.70   10.80   12.90
       12         LU      0    0.05
       13         US   4.99    0.45

       14         KK   ROUTE
       15         RT   2.40       2

       16         KK   SUB2
       17         KM   SUBAREA GOLEMAN GULLEY BETWEEN HWY 105 & CONFLUENCE WITH CLEMMONS GULLEY
       18         KM   DRAINAGE AREA OF 0.47 SQUARE MILES
       19         BA   0.47
       20         US   3.59    0.45

       21         KK   TOTAL
       22         KM   COMBINE HYDROGRAPHS FROM SUB1 & SUB2
       23         HC      2

       24         KK   SUB3
       25         KM   SUBAREA OF CLEMMONS GULLEY ABOVE CONFLUENCE WITH GOLEMAN GULLEY
       26         KM   DRAINAGE AREA OF 17.12 SQUARE MILES
       27         BA   17.12
       28         US   13.24    0.45

       29         KK   TOTAL
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```
          30          KM   COMBINE HYDROGRAPHS FROM SUB1, SUB2, & SUB3
          31          HC     2

          32          KK  ROUTE
          33          RT   3.87      2

          34          KK   SUB4
          35          KM   SUBAREA OF CLEMMONS GULLEY BETWEEN LITTLE PINE ISLAND BAYOU AND GOLEMAN
          36          KM   DRAINAGE AREA OF 1.18 SQUARE MILES
          37          BA   1.18
          38          US   4.78    0.45

          39          KK   TOTAL
          40          KM   COMBINE HYDROGRAPHS FROM SUB1, SUB2, SUB3, & SUB4
          41          HC     2
          42          ZZ
1                                                    ****
                        FLOOD HYDROGRAPH PACKAGE HEC-1 (IBM XT 512K VERSION) -FEB 1,1985
                   U.S. ARMY CORPS OF ENGINEERS, THE HYDROLOGIC ENGINEERING CENTER, 609 SECOND STREET, DAVIS, CA. 95616
                                                    ****



                            HARDIN COUNTY WCID NO. 1  JOB NO. HD-002   AUG. 88   MRD  FILE CLEM100
                            CLEMMONS GULLEY
                            100-YEAR FLOOD

  5 IO          OUTPUT CONTROL VARIABLES
                     IPRNT         3  PRINT CONTROL
                     IPLOT         0  PLOT CONTROL
                     QSCAL         0.  HYDROGRAPH PLOT SCALE

    IT          HYDROGRAPH TIME DATA
                      NMIN        30  MINUTES IN COMPUTATION INTERVAL
                     IDATE     1    0  STARTING DATE
                     ITIME        0000  STARTING TIME
                        NQ        96  NUMBER OF HYDROGRAPH ORDINATES
                     NDDATE     2    0  ENDING DATE
                     NDTIME        2330  ENDING TIME

                   COMPUTATION INTERVAL      .50 HOURS
                       TOTAL TIME BASE   47.50 HOURS

          ENGLISH UNITS


*** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** *** ***


                ************
                *          *
  6 KK          *     SUB1 *
                *          *
```

****

SUBAREA GOLEMAN GULLEY ABOVE HWY 105
DRAINAGE AREA OF 1.23 SQUARE MILES

SUBBASIN RUNOFF DATA

9 BA SUBBASIN CHARACTERISTICS

TAREA	1.23	SUBBASIN AREA

PRECIPITATION DATA

11 PH DEPTHS FOR 1-PERCENT HYPOTHETICAL STORM

HYDRO-35			TP-40					TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.90	2.02	4.65	6.10	6.90	8.70	10.80	12.90	.00	.00	.00	.00

STORM AREA = 1.23

12 LU UNIFORM LOSS RATE

STRTL	.00	INITIAL LOSS
CNSTL	.05	UNIFORM LOSS RATE
RTIMP	.00	PERCENT IMPERVIOUS AREA

13 US SNYDER UNITGRAPH

TP	4.99	LAG
CP	.45	PEAKING COEFFICIENT

SYNTHETIC ACCUMULATED-AREA VS. TIME CURVE WILL BE USED

***

UNIT HYDROGRAPH PARAMETERS
CLARK TC 5.19 HR R 7.96 HR
SNYDER TP 5.00 HR CP .45

UNIT HYDROGRAPH
90 END-OF-PERIOD ORDINATES

2.	8.	16.	25.	36.	47.	57.	65.	70.	73.
72.	68.	64.	60.	56.	53.	50.	47.	44.	41.
39.	36.	34.	32.	30.	28.	26.	25.	23.	22.
21.	19.	18.	17.	16.	15.	14.	13.	12.	12.
11.	10.	10.	9.	9.	8.	8.	7.	7.	6.
6.	6.	5.	5.	5.	4.	4.	4.	4.	3.
3.	3.	3.	3.	2.	2.	2.	2.	2.	2.
2.	2.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.

*** *** *** *** ***

HYDROGRAPH AT STATION SUB1

TOTAL RAINFALL = 12.88, TOTAL LOSS = 1.20, TOTAL EXCESS = 11.68

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	47.50-HR

+	(CFS)	(HR)					
			(CFS)				
+	630.	17.00		573.	337.	192.	192.
			(INCHES)	4.328	10.199	11.464	11.464
			(AC-FT)	284.	669.	752.	752.

CUMULATIVE AREA = 1.23 SQ MI

*** ***

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          **************
          *            *
14 KK     *    ROUTE   *
          *            *
          **************
```

HYDROGRAPH ROUTING DATA

15 RT TATUM OR STRADDLE-STAGGER ROUTING

NSTPS	2	NUMBER OF TATUM STEPS
NSTDL	2	NUMBER OF ORDINATES TO BE AVERAGED
LAG	0	NUMBER OF INTERVALS TO LAG HYDROGRAPH

*** *** *** *** ***

HYDROGRAPH AT STATION ROUTE

PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
			6-HR	24-HR	72-HR	47.50-HR
+ (CFS)	(HR)					
		(CFS)				
+ 627.	18.00		571.	337.	191.	191.
		(INCHES)	4.314	10.196	11.450	11.450
		(AC-FT)	283.	669.	751.	751.

CUMULATIVE AREA = 1.23 SQ MI

*** ***

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          **************
          *            *
16 KK     *    SUB2    *
          *            *
          **************
```

SUBAREA GOLEMAN GULLEY BETWEEN HWY 105 & CONFLUENCE WITH CLEMMONS GULLEY

DRAINAGE AREA OF 0.47 SQUARE MILES

SUBBASIN RUNOFF DATA

19 BA SUBBASIN CHARACTERISTICS

TAREA .47 SUBBASIN AREA

PRECIPITATION DATA

11 PH DEPTHS FOR 1-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.90	2.02	4.65	6.10	6.90	8.70	10.80	12.90	.00	.00	.00	.00

STORM AREA = .47

12 LU UNIFORM LOSS RATE

STRTL .00 INITIAL LOSS

CNSTL .05 UNIFORM LOSS RATE

RTIMP .00 PERCENT IMPERVIOUS AREA

20 US SNYDER UNITGRAPH

TP 3.59 LAG

CP .45 PEAKING COEFFICIENT

SYNTHETIC ACCUMULATED-AREA VS. TIME CURVE WILL BE USED

***

UNIT HYDROGRAPH PARAMETERS

CLARK TC 3.87 HR R 5.64 HR

SNYDER TP 3.62 HR CP .45

UNIT HYDROGRAPH

64 END-OF-PERIOD ORDINATES

2.	6.	13.	21.	28.	34.	38.	38.	36.	33.
30.	28.	25.	23.	21.	19.	18.	16.	15.	14.
12.	11.	10.	10.	9.	8.	7.	7.	6.	6.
5.	5.	4.	4.	4.	3.	3.	3.	3.	2.
2.	2.	2.	2.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.	1.	0.	0.	0.
0.	0.	0.	0.						

*** *** *** *** ***

HYDROGRAPH AT STATION SUB2

TOTAL RAINFALL = 12.89, TOTAL LOSS = 1.20, TOTAL EXCESS = 11.69

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	47.50-HR
+	(CFS)	(HR)					
			(CFS)				
+	310.	16.00		267.	137.	74.	74.
			(INCHES)	5.273	10.808	11.628	11.628

(AC-FT) 132. 271. 291. 291.

CUMULATIVE AREA = .47 SQ MI

*** ***

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          **************
          *            *
 21 KK    *    TOTAL   *
          *            *
          **************
```

COMBINE HYDROGRAPHS FROM SUB1 & SUB2

23 HC HYDROGRAPH COMBINATION
ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

*** *** *** *** ***

HYDROGRAPH AT STATION TOTAL

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	47.50-HR
+	(CFS)	(HR)					
			(CFS)				
+	902.	17.50		822.	472.	266.	266.
			(INCHES)	4.497	10.323	11.499	11.499
			(AC-FT)	408.	936.	1043.	1043.

CUMULATIVE AREA = 1.70 SQ MI

*** ***

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          **************
          *            *
 24 KK    *    SUB3    *
          *            *
          **************
```

SUBAREA OF CLEMMONS GULLEY ABOVE CONFLUENCE WITH GOLEMAN GULLEY
DRAINAGE AREA OF 17.12 SQUARE MILES

SUBBASIN RUNOFF DATA

27 BA SUBBASIN CHARACTERISTICS
TAREA 17.12 SUBBASIN AREA

PRECIPITATION DATA

11 PH DEPTHS FOR 1-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.90	2.02	4.65	6.10	6.90	8.70	10.80	12.90	.00	.00	.00	.00

STORM AREA = 17.12

12 LU UNIFORM LOSS RATE

STRTL	.00	INITIAL LOSS
CNSTL	.05	UNIFORM LOSS RATE
RTIMP	.00	PERCENT IMPERVIOUS AREA

28 US SNYDER UNITGRAPH

TP	13.24	LAG
CP	.45	PEAKING COEFFICIENT

SYNTHETIC ACCUMULATED-AREA VS. TIME CURVE WILL BE USED

***

UNIT HYDROGRAPH PARAMETERS
CLARK TC 13.54 HR R 20.94 HR
SNYDER TP 13.30 HR CP .45

UNIT HYDROGRAPH
150 END-OF-PERIOD ORDINATES
VOLUME = .96

3.	10.	21.	34.	49.	65.	83.	102.	121.	142.
163.	186.	208.	232.	254.	276.	295.	313.	330.	344.
357.	368.	377.	384.	388.	390.	389.	383.	374.	365.
356.	348.	340.	332.	324.	316.	309.	301.	294.	287.
281.	274.	267.	261.	255.	249.	243.	237.	232.	226.
221.	216.	211.	206.	201.	196.	191.	187.	182.	178.
174.	170.	166.	162.	158.	154.	151.	147.	144.	140.
137.	134.	131.	128.	125.	122.	119.	116.	113.	111.
108.	105.	103.	100.	98.	96.	94.	91.	89.	87.
85.	83.	81.	79.	77.	75.	74.	72.	70.	69.
67.	65.	64.	62.	61.	59.	58.	57.	55.	54.
53.	51.	50.	49.	48.	47.	46.	45.	44.	43.
42.	41.	40.	39.	38.	37.	36.	35.	34.	33.
33.	32.	31.	30.	30.	29.	28.	28.	27.	26.
26.	25.	25.	24.	23.	23.	22.	22.	21.	21.

*** *** *** *** ***

HYDROGRAPH AT STATION SUB3

TOTAL RAINFALL = 12.64, TOTAL LOSS = 1.20, TOTAL EXCESS = 11.44

PEAK FLOW	TIME	MAXIMUM AVERAGE FLOW			
		6-HR	24-HR	72-HR	47.50-HR
+ (CFS)	(HR)	(CFS)			

+	3966.	25.50		3858.	3130.	1963.	1963.
			(INCHES)	2.095	6.798	8.440	8.440
			(AC-FT)	1913.	6207.	7706.	7706.

CUMULATIVE AREA = 17.12 SQ MI

*** ***

29 KK

****
* *
* TOTAL *
* *
****

COMBINE HYDROGRAPHS FROM SUB1, SUB2, & SUB3

31 HC HYDROGRAPH COMBINATION

ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

*** *** *** *** ***

HYDROGRAPH AT STATION TOTAL

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	47.50-HR
+	(CFS)	(HR)					
			(CFS)				
+	4431.	25.00		4319.	3502.	2229.	2229.
			(INCHES)	2.134	6.921	8.716	8.716
			(AC-FT)	2142.	6946.	8748.	8748.

CUMULATIVE AREA = 18.82 SQ MI

*** ***

32 KK

****
* *
* ROUTE *
* *
****

HYDROGRAPH ROUTING DATA

33 RT TATUM OR STRADDLE-STAGGER ROUTING

NSTPS 3 NUMBER OF TATUM STEPS

NSTDL 2 NUMBER OF ORDINATES TO BE AVERAGED

LAG 0 NUMBER OF INTERVALS TO LAG HYDROGRAPH

*** *** *** *** *** ***

HYDROGRAPH AT STATION ROUTE

	PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	47.50-HR
			(CFS)				
+	4426.	25.50		4315.	3500.	2203.	2203.
			(INCHES)	2.132	6.916	8.614	8.614
			(AC-FT)	2140.	6942.	8646.	8646.

CUMULATIVE AREA = 18.82 SQ MI

*** ***

34 KK

****
* *
* SUB4 *
* *
****

SUBAREA OF CLEMMONS GULLEY BETWEEN LITTLE PINE ISLAND BAYOU AND GOLEMAN
DRAINAGE AREA OF 1.18 SQUARE MILES

SUBBASIN RUNOFF DATA

37 BA SUBBASIN CHARACTERISTICS
TAREA 1.18 SUBBASIN AREA

PRECIPITATION DATA

11 PH DEPTHS FOR 1-PERCENT HYPOTHETICAL STORM

..... HYDRO-35			..... TP-40					..... TP-49			
5-MIN	15-MIN	60-MIN	2-HR	3-HR	6-HR	12-HR	24-HR	2-DAY	4-DAY	7-DAY	10-DAY
.90	2.02	4.65	6.10	6.90	8.70	10.80	12.90	.00	.00	.00	.00

STORM AREA = 1.18

12 LU UNIFORM LOSS RATE
STRTL .00 INITIAL LOSS
CNSTL .05 UNIFORM LOSS RATE
RTIMP .00 PERCENT IMPERVIOUS AREA

38 US SNYDER UNITGRAPH
TP 4.78 LAG
CP .45 PEAKING COEFFICIENT

SYNTHETIC ACCUMULATED-AREA VS. TIME CURVE WILL BE USED

***

UNIT HYDROGRAPH PARAMETERS
CLARK TC 5.03 HR R 7.58 HR
SNYDER TP 4.78 HR CP .45

UNIT HYDROGRAPH
86 END-OF-PERIOD ORDINATES

2.	8.	17.	27.	38.	49.	59.	67.	71.	73.
71.	66.	62.	58.	55.	51.	48.	45.	42.	39.
37.	34.	32.	30.	28.	26.	25.	23.	22.	20.
19.	18.	17.	16.	15.	14.	13.	12.	11.	10.
10.	9.	9.	8.	8.	7.	7.	6.	6.	5.
5.	5.	4.	4.	4.	4.	3.	3.	3.	3.
3.	2.	2.	2.	2.	2.	2.	2.	2.	1.
1.	1.	1.	1.	1.	1.	1.	1.	1.	1.
1.	1.	1.	1.	1.	1.				

*** *** *** *** ***

HYDROGRAPH AT STATION SUB4

TOTAL RAINFALL = 12.88, TOTAL LOSS = 1.20, TOTAL EXCESS = 11.68

	PEAK FLOW	TIME		MAXIMUM AVERAGE FLOW			
				6-HR	24-HR	72-HR	47.50-HR
+	(CFS)	(HR)					
			(CFS)				
+	628.	17.00		565.	327.	184.	184.
			(INCHES)	4.455	10.296	11.504	11.504
			(AC-FT)	280.	648.	724.	724.

CUMULATIVE AREA = 1.18 SQ MI

*** ***

39 KK TOTAL

COMBINE HYDROGRAPHS FROM SUB1, SUB2, SUB3, & SUB4

41 HC HYDROGRAPH COMBINATION
ICOMP 2 NUMBER OF HYDROGRAPHS TO COMBINE

***

*** *** *** *** ***

HYDROGRAPH AT STATION TOTAL

PEAK FLOW (CFS)	TIME (HR)		MAXIMUM AVERAGE FLOW 6-HR	24-HR	72-HR	47.50-HR
		(CFS)				
4739.	25.00		4634.	3769.	2387.	2387.
		(INCHES)	2.154	7.008	8.785	8.785
		(AC-FT)	2298.	7475.	9370.	9370.

CUMULATIVE AREA = 20.00 SQ MI

1

RUNOFF SUMMARY
FLOW IN CUBIC FEET PER SECOND
TIME IN HOURS, AREA IN SQUARE MILES

OPERATION	STATION	PEAK FLOW	TIME OF PEAK	AVERAGE FLOW FOR MAXIMUM PERIOD 6-HOUR	24-HOUR	72-HOUR	BASIN AREA	MAXIMUM STAGE	TIME OF MAX STAGE
HYDROGRAPH AT	SUB1	630.	17.00	573.	337.	192.	1.23		
ROUTED TO	ROUTE	627.	18.00	571.	337.	191.	1.23		
HYDROGRAPH AT	SUB2	310.	16.00	267.	137.	74.	.47		
2 COMBINED AT	TOTAL	902.	17.50	822.	472.	266.	1.70		
HYDROGRAPH AT	SUB3	3966.	25.50	3858.	3130.	1963.	17.12		
2 COMBINED AT	TOTAL	4431.	25.00	4319.	3502.	2229.	18.82		
ROUTED TO	ROUTE	4426.	25.50	4315.	3500.	2203.	18.82		
HYDROGRAPH AT	SUB4	628.	17.00	565.	327.	184.	1.18		
2 COMBINED AT	TOTAL	4739.	25.00	4634.	3769.	2387.	20.00		

*** NORMAL END OF HEC-1 ***

APPENDIX 3

HEC-2 COMPUTER MODEL OF COON MARSH GULLY (EXISTING CONDITIONS)

THIS RUN EXECUTED 07/16/89 16:37:44

```
*******************************************
  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION
*******************************************

FR
T1 HARDIN COUNTY WCID NO. 1 FLOOD STUDY              JOB HD-002   JULY 89  JNH
T2 EXISTING CONDITIONS 100-YEAR FLOOD                   COMPUTER FILE COONEX4
T3 COON MARSH GULLY   START AT NORMAL DEPTH   DIVERTED Q EXCLUDED (PM DR.& DD)

J1  ICHECK     INQ       NINW      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.        8.        0.        0.   .001800       .00        .0        0.    21.000      .000

J2  NPROF      IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1.000      .000    -1.000      .000      .000      .000      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000    43.000    13.000    14.000    15.000    40.000     1.000     2.000     3.000    10.000

    11.000    12.000     5.000    38.000    39.000    42.000     4.000    53.000    54.000    27.000

    28.000    25.000    26.000    16.000    17.000    18.000      .000      .000      .000      .000

J5  LPRNT     NUMSEC                    ********REQUESTED SECTION NUMBERS********

   -10.000   -10.000      .000      .000      .000      .000      .000      .000      .000      .000

NC      .120      .120      .050      .100      .300      .000      .000      .000      .000      .000
QT     7.000   300.000   410.000   770.000   980.000  1310.000  1530.000  1720.000      .000      .000
X1  4150.000    33.000  1591.000  1689.000      .000      .000      .000      .000      .000      .000
GR    25.400  1000.000    25.400  1050.000    24.700  1100.000    25.300  1150.000    25.500  1200.000
GR    25.400  1250.000    25.200  1300.000    24.700  1350.000    23.400  1400.000    21.800  1450.000
GR    20.600  1500.000    19.400  1522.000    17.900  1537.000    20.300  1564.000    19.600  1579.000
GR    18.400  1582.000    16.900  1591.000    14.500  1600.000    16.900  1609.000    19.400  1645.000
GR    19.700  1660.000    19.700  1672.000    21.200  1700.000    22.000  1720.000    21.500  1750.000
GR    22.300  1767.000    23.100  1800.000    24.900  1850.000    26.000  1900.000    26.200  1950.000
GR    26.300  2000.000    26.100  2050.000    26.100  2100.000      .000      .000      .000      .000
```

X1	5700.000	20.000	1685.000	1715.000	1300.000	1250.000	1550.000	.000	.000	.000
X4	4.000	17.300	1694.000	17.300	1695.000	17.200	1704.000	17.200	1705.000	.000
GR	26.300	1000.000	26.300	1100.000	26.200	1200.000	25.800	1300.000	25.200	1400.000
GR	24.000	1500.000	22.300	1600.000	22.900	1685.000	17.300	1687.000	17.100	1713.000
GR	22.700	1715.000	22.800	1800.000	24.200	1900.000	25.500	2000.000	26.100	2100.000
GR	26.500	2200.000	26.600	2300.000	27.000	2400.000	27.200	2500.000	27.000	2600.000
NC	.020	.020	.030	.300	.500	.000	.000	.000	.000	.000
X1	5701.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
BT	14.000	1600.000	22.300	22.300	1685.000	22.700	20.900	1687.000	22.700	20.900
BT	1694.000	22.800	21.000	1694.000	22.800	17.300	1695.000	22.800	17.300	1695.000
BT	22.800	22.000	1704.000	22.800	22.000	1704.000	22.800	17.200	1705.000	22.800
BT	17.200	1705.000	22.800	22.000	1713.000	22.900	22.100	1715.000	22.900	22.100
BT	1800.000	22.800	22.800	.000	.000	.000	.000	.000	.000	.000
X1	5719.000	.000	.000	.000	18.000	18.000	18.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.120	.120	.050	.300	.500	.000	.000	.000	.000	.000
X1	5720.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
NC	.120	.120	.050	.100	.300	.000	.000	.000	.000	.000
QT	7.000	70.000	110.000	250.000	280.000	320.000	330.000	340.000	.000	.000
X1	9750.000	21.000	1995.000	2005.000	3400.000	3700.000	4030.000	.000	.000	.000
GR	31.000	1000.000	31.200	1100.000	31.400	1200.000	31.400	1300.000	31.000	1400.000
GR	30.400	1500.000	29.900	1600.000	29.400	1700.000	28.600	1800.000	27.900	1900.000
GR	27.500	1995.000	24.500	1996.000	24.400	2004.000	28.000	2005.000	28.600	2100.000
GR	29.600	2200.000	30.200	2300.000	31.000	2400.000	31.700	2500.000	31.900	2600.000
GR	32.700	2700.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	12150.000	30.000	2666.000	2678.000	2520.000	2200.000	2400.000	.000	.000	.000
GR	29.300	1000.000	27.700	1100.000	27.700	1200.000	27.700	1206.000	27.500	1300.000
GR	27.700	1400.000	27.900	1500.000	28.600	1600.000	28.100	1700.000	28.200	1800.000
GR	30.400	1900.000	30.600	2000.000	30.800	2100.000	30.200	2200.000	30.500	2300.000
GR	31.300	2400.000	31.300	2500.000	31.500	2600.000	31.900	2634.000	27.900	2666.000
GR	25.300	2670.000	24.900	2673.000	27.600	2678.000	28.400	2700.000	28.900	2750.000
GR	30.700	2800.000	30.500	2900.000	31.000	3000.000	31.400	3100.000	31.300	3200.000
X1	12950.000	38.000	1691.000	1711.000	900.000	800.000	800.000	.000	.000	.000
GR	31.600	1000.000	30.900	1022.000	31.200	1046.000	31.000	1100.000	31.300	1150.000
GR	30.100	1200.000	30.000	1250.000	29.600	1300.000	29.400	1350.000	29.200	1400.000
GR	29.100	1450.000	28.800	1500.000	27.900	1550.000	27.800	1600.000	27.800	1640.000
GR	28.000	1665.000	28.000	1685.000	27.400	1691.000	25.900	1695.000	25.600	1700.000
GR	25.900	1705.000	26.000	1711.000	29.400	1717.000	29.900	1722.000	29.700	1726.000
GR	28.500	1727.000	28.100	1730.000	27.900	1740.000	27.900	1800.000	27.900	1850.000
GR	28.600	1900.000	29.000	1950.000	29.300	2000.000	29.500	2050.000	29.800	2100.000
GR	30.200	2150.000	30.400	2200.000	30.700	2250.000	.000	.000	.000	.000

QT	7.000	180.000	230.000	350.000	360.000	350.000	320.000	320.000	.000	.000
X1	13840.000	15.000	1475.000	1509.000	700.000	850.000	890.000	.000	.000	.000
GR	31.700	1000.000	31.900	1100.000	31.800	1200.000	31.900	1300.000	31.600	1400.000
GR	30.400	1475.000	24.800	1485.000	23.600	1495.000	24.400	1505.000	30.900	1509.000
GR	31.400	1600.000	31.900	1700.000	32.300	1800.000	32.200	1900.000	32.300	2000.000
MC	.015	.015	.020	.300	.500	.000	.000	.000	.000	.000
X1	13841.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
BT	6.000	1400.000	31.600	31.600	1475.000	31.600	30.400	1485.000	31.600	29.600
BT	1505.000	31.600	29.600	1509.000	31.600	30.900	1600.000	31.400	31.400	.000
X1	13879.000	.000	.000	.000	38.000	38.000	38.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
MC	.120	.120	.050	.300	.500	.000	.000	.000	.000	.000
X1	13880.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
MC	.120	.120	.050	.100	.300	.000	.000	.000	.000	.000
X1	14930.000	44.000	1587.000	1611.000	1040.000	1100.000	1050.000	.000	.000	.000
GR	31.600	1000.000	31.400	1050.000	31.500	1100.000	31.900	1150.000	32.400	1165.000
GR	31.700	1200.000	31.700	1220.000	31.000	1255.000	31.200	1264.000	31.000	1273.000
GR	30.800	1278.000	28.700	1285.000	28.300	1288.000	28.500	1290.000	30.500	1295.000
GR	31.000	1300.000	30.700	1345.000	29.600	1430.000	30.500	1490.000	29.400	1520.000
GR	29.500	1548.000	28.700	1569.000	29.600	1582.000	28.800	1587.000	25.700	1597.000
GR	29.500	1600.000	25.100	1603.000	25.600	1607.000	27.700	1611.000	29.600	1620.000
GR	28.800	1633.000	30.300	1638.000	31.800	1644.000	29.500	1651.000	29.700	1700.000
GR	29.700	1750.000	29.800	1766.000	29.400	1770.000	30.600	1774.000	31.300	1800.000
GR	31.900	1900.000	32.500	1950.000	32.700	2000.000	33.000	2050.000	.000	.000
QT	7.000	180.000	230.000	420.000	560.000	790.000	960.000	1100.000	.000	.000
X1	16010.000	16.000	1501.000	1523.000	1020.000	1100.000	1080.000	.000	.000	.000
GR	30.800	1000.000	30.400	1100.000	29.800	1200.000	29.100	1300.000	28.900	1400.000
GR	29.100	1472.000	33.100	1481.000	29.400	1491.000	28.800	1501.000	24.100	1506.000
GR	24.700	1519.000	28.000	1523.000	30.500	1600.000	31.700	1700.000	32.600	1800.000
GR	34.600	1845.000	.000	.000	.000	.000	.000	.000	.000	.000
QT	7.000	150.000	190.000	340.000	450.000	630.000	760.000	870.000	.000	.000
X1	17930.000	22.000	1205.000	1230.000	2060.000	1880.000	1920.000	.000	.000	.000
GR	32.100	705.000	31.700	800.000	31.200	900.000	30.900	1000.000	29.800	1100.000
GR	29.500	1200.000	29.200	1205.000	24.900	1211.000	25.500	1220.000	28.900	1230.000
GR	29.900	1300.000	30.600	1400.000	30.100	1500.000	30.200	1600.000	29.700	1700.000
GR	29.500	1800.000	31.100	1900.000	31.400	2000.000	32.100	2100.000	32.100	2200.000
GR	31.600	2300.000	32.100	2400.000	.000	.000	.000	.000	.000	.000
X1	19530.000	33.000	1280.000	1316.000	1420.000	1660.000	1600.000	.000	.000	.000
GR	31.400	800.000	30.700	1000.000	30.600	1050.000	30.500	1100.000	31.000	1150.000
GR	30.700	1200.000	30.500	1220.000	31.300	1264.000	31.600	1280.000	31.000	1285.000
GR	29.900	1289.000	27.400	1295.000	26.300	1296.000	26.100	1300.000	26.400	1304.000
GR	27.600	1305.000	28.400	1309.000	31.400	1316.000	31.600	1323.000	31.500	1328.000
GR	32.000	1331.000	31.700	1334.000	30.300	1338.000	30.100	1342.000	30.000	1360.000
GR	30.700	1416.000	30.000	1420.000	31.200	1427.000	32.200	1455.000	31.000	1500.000
GR	31.600	1550.000	31.200	1600.000	32.200	1760.000	.000	.000	.000	.000

X1	19855.000	.000	.000	.000	325.000	325.000	325.000	.000	.000	.000
NC	.015	.015	.027	.300	.500	.000	.000	.000	.000	.000
NH	3.000	.015	1296.000	.027	1300.000	.015	1600.000	.000	.000	.000
X1	19856.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
BT	12.000	1288.000	31.600	31.600	1285.000	31.600	31.000	1289.000	31.600	29.900
BT	1295.000	31.600	27.400	1296.000	31.600	26.300	1296.000	31.600	29.300	1300.000
BT	31.600	29.300	1300.000	31.600	26.100	1304.000	31.600	26.400	1305.000	31.600
BT	27.600	1309.000	31.600	28.400	1316.000	31.400	31.400	.000	.000	.000
X1	19894.000	.000	.000	.000	38.000	38.000	38.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.120	.120	.050	.300	.500	.000	.000	.000	.000	.000
X1	19895.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
NC	.120	.120	.050	.100	.300	.000	.000	.000	.000	.000
QT	7.000	110.000	140.000	250.000	340.000	470.000	560.000	630.000	.000	.000
X1	21660.000	9.000	1784.000	1821.000	2000.000	1400.000	1765.000	.000	.000	.000
GR	30.100	1500.000	32.200	1600.000	29.600	1700.000	29.500	1784.000	28.700	1800.000
GR	29.700	1821.000	29.700	1900.000	30.100	2000.000	30.500	2100.000	.000	.000
X1	21860.000	16.000	1792.000	1809.000	200.000	200.000	200.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	32.300	32.300	.000
GR	30.100	1000.000	30.100	1500.000	32.200	1600.000	29.600	1700.000	29.500	1784.000
GR	28.700	1792.000	28.700	1797.000	28.700	1798.000	28.700	1803.000	28.700	1804.000
GR	28.700	1809.000	29.700	1821.000	29.700	1900.000	30.100	2000.000	30.500	2100.000
GR	30.500	2600.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.015	.015	.015	.300	.500	.000	.000	.000	.000	.000
X1	21861.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
BT	31.000	1000.000	32.800	32.800	1000.000	32.800	30.100	1100.000	32.700	30.100
BT	1200.000	32.600	30.100	1300.000	32.700	30.100	1400.000	32.700	30.100	1500.000
BT	32.800	30.100	1600.000	33.000	32.200	1700.000	33.200	29.600	1784.000	33.200
BT	29.500	1792.000	33.300	28.700	1792.000	33.300	31.700	1797.000	33.300	31.700
BT	1797.000	33.300	28.700	1798.000	33.300	28.700	1798.000	33.300	31.700	1803.000
BT	33.300	31.700	1803.000	33.300	28.700	1804.000	33.300	28.700	1804.000	33.300
BT	31.700	1809.000	33.300	31.700	1809.000	33.300	28.700	1821.000	33.300	29.700
BT	1900.000	33.100	29.700	2000.000	32.800	30.100	2100.000	32.800	30.500	2200.000
BT	32.900	30.500	2300.000	32.800	30.500	2500.000	32.800	30.500	2600.000	32.900
BT	30.500	2600.000	32.900	32.900	.000	.000	.000	.000	.000	.000
X1	21941.000	.000	.000	.000	80.000	80.000	80.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.120	.120	.050	.300	.500	.000	.000	.000	.000	.000
X1	21942.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	32.800	32.800	.000

THIS RUN EXECUTED 07/16/89 16:40:26

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
 ERROR CORR - 01,02,03,04,05,06
 MODIFICATION - 50,51,52,53,54,55,56
 IBM-PC-XT VERSION
##########################################

T1 HARDIN COUNTY WCID NO. 1 FLOOD STUDY              JOB HD-002  JULY 89  JNH
T2 EXISTING CONDITIONS 50-YEAR FLOOD                   COMPUTER FILE COONEX4
T3 COON MARSH GULLY  START AT NORMAL DEPTH  DIVERTED Q EXCLUDED (DD & PN DR.)

J1  ICHECK    INQ      NRNV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0.       7.       0.       0.  .001800      .00       .0       0.   21.000     .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     2.000     .000   -1.000     .000     .000     .000     .000     .000     .000     .000
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THIS RUN EXECUTED 07/16/89 16:40:44

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
 ERROR CORR - 01,02,03,04,05,06
 MODIFICATION - 50,51,52,53,54,55,56
 IBM-PC-XT VERSION
##########################################

T1 HARDIN COUNTY MCID NO. 1 FLOOD STUDY              JOB HD-002  JULY 89 JNH
T2 EXISTING CONDITIONS 25-YEAR FLOOD                   COMPUTER FILE COONEX4
T3 COON MARSH GULLY  START AT NORMAL DEPTH  DIVERTED Q EXCLUDED (DD & PH DR.)

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC    HVINS     Q        WSEL     FQ

       0.      6.       0.       0.   .001800      .00       .0       0.   21.000     .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC     IBW      CHNIM    ITRACE

     3.000     .000   -1.000     .000     .000     .000     .000     .000     .000     .000
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THIS RUN EXECUTED 07/16/89 16:41:27

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**********************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
 ERROR CORR - 01,02,03,04,05,06
 MODIFICATION - 50,51,52,53,54,55,56
 IBM-PC-XT VERSION
**********************************************

T1 HARDIN COUNTY MCID NO. 1 FLOOD STUDY              JOB HD-002  JULY 89  JMH
T2 EXISTING CONDITIONS 5-YEAR FLOOD                    COMPUTER FILE COONEX4
T3 COON MARSH GULLY  START AT NORMAL DEPTH  DIVERTED Q EXCLUDED (DD & PM DR.)

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

       0.      4.       0.       0.  .001800       .00      .0       0.   21.000     .000

J2  NPROF     IPLOT    PMFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     5.000      .000   -1.000      .000     .000     .000     .000     .000     .000     .000
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THIS RUN EXECUTED 07/16/89 16:41:06

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##########################################
 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
##########################################

T1 HARDIN COUNTY MCID NO. 1 FLOOD STUDY              JOB HD-002  JULY 89  JNH
T2 EXISTING CONDITIONS 10-YEAR FLOOD                   COMPUTER FILE COONEX4
T3 COON MARSH GULLY   START AT NORMAL DEPTH   DIVERTED Q EXCLUDED (DD & PM DR.)

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0.       5.       0.       0.  .001800      .00      .0       0.   21.000     .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLOC    IBW      CHNIM    ITRACE

     4.000     .000   -1.000     .000     .000     .000     .000     .000     .000     .000
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THIS RUN EXECUTED 07/16/89 16:41:49

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
**********************************************

T1 HARDIN COUNTY MCID NO. 1 FLOOD STUDY              JOB HD-002  JULY 89  JNH
T2 EXISTING CONDITIONS 2-YEAR FLOOD                    COMPUTER FILE COONEX4
T3 COON MARSH GULLY   START AT NORMAL DEPTH   DIVERTED Q EXCLUDED (DD & PM DR.)

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.       3.        0.        0.   .001800       .00        .0        0.    21.000      .000

J2  NPROF     IPLOT     PMFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     6.000      .000    -1.000      .000      .000      .000      .000      .000      .000      .000
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SECNO	Q	QLOB	QCH	QROB	ELTRD	CWSEL	CRIWS	EG	HV	HL	QLOSS	10K*S
5720.000	1720.00	460.11	881.06	378.82	.00	25.51	.00	25.62	.11	.00	.04	13.53
5720.000	1530.00	380.64	838.43	310.92	.00	25.26	.00	25.38	.12	.00	.04	13.62
5720.000	1310.00	292.02	784.87	233.11	.00	24.94	.00	25.06	.12	.00	.05	13.80
5720.000	980.00	166.89	688.62	124.49	.00	24.37	.00	24.50	.13	.00	.05	13.88
5720.000	770.00	92.79	612.56	64.65	.00	23.92	.00	24.05	.13	.00	.05	13.84
5720.000	410.00	2.43	407.57	.00	.00	22.70	.00	22.81	.11	.00	.02	12.40
5720.000	300.00	.00	300.00	.00	.00	21.93	.00	22.01	.08	.00	.01	10.87
9750.000	340.00	185.36	80.28	74.36	.00	29.83	.00	29.84	.01	4.21	.01	5.62
9750.000	330.00	177.66	83.59	68.75	.00	29.72	.00	29.74	.01	4.35	.01	6.54
9750.000	320.00	169.49	88.07	62.44	.00	29.60	.00	29.62	.02	4.55	.01	7.88
9750.000	280.00	141.10	91.99	46.91	.00	29.36	.00	29.38	.02	4.87	.01	10.27
9750.000	250.00	119.83	94.64	35.53	.00	29.16	.00	29.19	.03	5.13	.01	12.52
9750.000	110.00	22.45	86.81	.74	.00	28.25	.00	28.33	.08	5.51	.00	22.95
9750.000	70.00	.00	70.00	.00	.00	27.23	.00	27.36	.13	5.33	.01	42.49
12150.000	340.00	294.72	26.52	18.76	.00	30.17	.00	30.17	.00	.33	.00	.59
12150.000	330.00	285.76	26.44	17.80	.00	30.10	.00	30.10	.00	.36	.00	.62
12150.000	320.00	276.75	26.42	16.83	.00	30.01	.00	30.02	.00	.39	.00	.66
12150.000	280.00	241.24	25.01	13.75	.00	29.82	.00	29.82	.00	.43	.00	.70
12150.000	250.00	214.50	24.00	11.50	.00	29.67	.00	29.67	.00	.48	.00	.75
12150.000	110.00	89.90	17.28	2.82	.00	28.92	.00	28.92	.00	.58	.01	.84
12150.000	70.00	51.08	17.93	.99	.00	28.47	.00	28.47	.00	1.10	.01	1.61
12950.000	340.00	142.06	67.85	130.09	.00	30.25	.00	30.25	.00	.07	.00	1.39
12950.000	330.00	136.72	68.05	125.23	.00	30.17	.00	30.18	.00	.08	.00	1.49
12950.000	320.00	131.30	68.38	120.32	.00	30.10	.00	30.10	.00	.08	.00	1.60
12950.000	280.00	111.93	65.70	102.36	.00	29.91	.00	29.91	.00	.09	.00	1.76
12950.000	250.00	97.63	63.23	89.14	.00	29.76	.00	29.77	.00	.10	.00	1.86
12950.000	110.00	35.64	42.99	31.37	.00	29.02	.00	29.02	.00	.10	.00	1.92
12950.000	70.00	18.66	36.18	15.16	.00	28.63	.00	28.63	.00	.16	.00	2.26
13840.000	320.00	.00	320.00	.00	.00	30.42	.00	30.47	.06	.21	.02	6.07
13840.000	320.00	.00	320.00	.00	.00	30.36	.00	30.42	.06	.22	.02	6.28
13840.000	350.00	.00	350.00	.00	.00	30.31	.00	30.39	.07	.26	.02	7.71
13840.000	360.00	.00	360.00	.00	.00	30.17	.00	30.25	.08	.31	.02	8.88
13840.000	350.00	.00	350.00	.00	.00	30.05	.00	30.13	.08	.34	.02	9.01
13840.000	230.00	.00	230.00	.00	.00	29.32	.00	29.37	.05	.33	.01	6.17
13840.000	180.00	.00	180.00	.00	.00	28.94	.00	28.97	.04	.33	.01	4.94
13841.000	320.00	.00	320.00	.00	31.40	30.41	.00	30.48	.08	.00	.01	3.49
13841.000	320.00	.00	320.00	.00	31.40	30.35	.00	30.43	.08	.00	.01	3.45
13841.000	350.00	.00	350.00	.00	31.40	30.30	.00	30.40	.09	.00	.01	4.06
13841.000	360.00	.00	360.00	.00	31.40	30.16	.00	30.26	.10	.00	.01	4.12
13841.000	350.00	.00	350.00	.00	31.40	30.04	.00	30.14	.09	.00	.01	3.77
13841.000	230.00	.00	230.00	.00	31.40	29.32	.00	29.37	.05	.00	.00	.99
13841.000	180.00	.00	180.00	.00	31.40	28.94	.00	28.97	.04	.00	.00	.79

SECNO	Q	QLOB	QCH	QROB	ELTRD	CHSEL	CRIWS	EG	HV	HL	QLOSS	10K*S
13879.000	320.00	.00	320.00	.00	31.40	30.42	.00	30.50	.08	.01	.00	3.50
13879.000	320.00	.00	320.00	.00	31.40	30.36	.00	30.44	.08	.01	.00	3.46
13879.000	350.00	.00	350.00	.00	31.40	30.32	.00	30.41	.09	.02	.00	4.08
13879.000	360.00	.00	360.00	.00	31.40	30.17	.00	30.27	.10	.02	.00	4.14
13879.000	350.00	.00	350.00	.00	31.40	30.06	.00	30.15	.09	.01	.00	3.79
13879.000	230.00	.00	230.00	.00	31.40	29.33	.00	29.38	.05	.00	.00	.98
13879.000	180.00	.00	180.00	.00	31.40	28.94	.00	28.98	.04	.00	.00	.78
13880.000	320.00	.00	320.00	.00	.00	30.45	.00	30.50	.06	.00	.01	5.95
13880.000	320.00	.00	320.00	.00	.00	30.39	.00	30.45	.06	.00	.01	6.18
13880.000	350.00	.00	350.00	.00	.00	30.35	.00	30.42	.07	.00	.01	7.56
13880.000	360.00	.00	360.00	.00	.00	30.20	.00	30.28	.08	.00	.01	8.72
13880.000	350.00	.00	350.00	.00	.00	30.07	.00	30.15	.08	.00	.00	8.91
13880.000	230.00	.00	230.00	.00	.00	29.33	.00	29.38	.05	.00	.00	6.15
13880.000	180.00	.00	180.00	.00	.00	28.94	.00	28.98	.04	.00	.00	4.93
14930.000	320.00	100.75	142.23	77.02	.00	31.03	.00	31.05	.01	.54	.00	4.49
14930.000	320.00	99.22	144.44	76.34	.00	31.00	.00	31.02	.02	.57	.00	4.75
14930.000	350.00	111.38	153.86	84.76	.00	31.06	.00	31.08	.02	.65	.01	5.15
14930.000	360.00	112.19	161.68	86.13	.00	31.01	.00	31.03	.02	.75	.01	5.90
14930.000	350.00	104.81	163.46	81.73	.00	30.93	.00	30.95	.02	.79	.01	6.45
14930.000	230.00	40.40	157.01	32.60	.00	30.20	.00	30.24	.04	.87	.00	11.56
14930.000	180.00	18.23	150.75	11.01	.00	29.79	.00	29.85	.06	.87	.01	16.54
16010.000	1100.00	589.14	375.81	135.06	.00	31.73	.00	31.77	.04	.71	.01	7.65
16010.000	960.00	505.76	339.39	114.85	.00	31.63	.00	31.66	.03	.64	.01	6.56
16010.000	790.00	411.72	285.17	93.11	.00	31.57	.00	31.60	.03	.52	.00	4.78
16010.000	560.00	282.30	214.44	63.26	.00	31.42	.00	31.43	.02	.40	.00	2.94
16010.000	420.00	204.89	169.41	45.70	.00	31.27	.00	31.28	.01	.33	.00	1.98
16010.000	230.00	86.22	124.16	19.62	.00	30.59	.00	30.60	.01	.36	.00	1.58
16010.000	180.00	53.65	113.01	13.34	.00	30.25	.00	30.26	.01	.40	.01	1.63
17930.000	870.00	191.27	177.57	501.16	.00	32.42	.00	32.42	.01	.65	.00	1.63
17930.000	760.00	162.35	166.74	430.91	.00	32.26	.00	32.27	.01	.60	.00	1.57
17930.000	630.00	129.57	150.27	350.16	.00	32.09	.00	32.09	.00	.50	.00	1.41
17930.000	450.00	85.28	124.63	240.10	.00	31.79	.00	31.79	.00	.36	.00	1.17
17930.000	340.00	59.75	106.65	173.59	.00	31.56	.00	31.56	.00	.28	.00	.99
17930.000	190.00	24.62	91.51	73.87	.00	30.87	.00	30.87	.01	.27	.00	1.18
17930.000	150.00	15.81	90.19	44.00	.00	30.55	.00	30.56	.01	.30	.00	1.46
19530.000	870.00	389.64	230.59	249.76	.00	32.82	.00	32.83	.01	.41	.00	4.74
19530.000	760.00	336.09	215.04	208.88	.00	32.65	.00	32.67	.01	.40	.00	4.73
19530.000	630.00	272.84	194.92	162.24	.00	32.45	.00	32.46	.01	.37	.00	4.63
19530.000	450.00	183.07	166.58	100.35	.00	32.11	.00	32.12	.01	.33	.00	4.68
19530.000	340.00	125.39	147.61	67.00	.00	31.85	.00	31.86	.01	.29	.00	4.83
19530.000	190.00	33.57	130.33	26.10	.00	31.23	.00	31.25	.02	.37	.01	6.79
19530.000	150.00	12.15	121.64	16.21	.00	30.98	.00	31.01	.03	.44	.01	7.17

SECNO	Q	QLOB	QCH	QROB	ELTRD	CHSEL	CRIMS	EG	HV	HL	QLOSS	100*S
19855.000	870.00	393.04	219.06	257.90	.00	32.96	.00	32.97	.01	.14	.00	3.81
19855.000	760.00	339.81	203.30	216.89	.00	32.79	.00	32.80	.01	.14	.00	3.76
19855.000	630.00	276.94	183.24	169.82	.00	32.59	.00	32.60	.01	.13	.00	3.63
19855.000	450.00	188.87	154.73	106.39	.00	32.24	.00	32.25	.01	.13	.00	3.54
19855.000	340.00	132.87	135.50	71.63	.00	31.98	.00	31.99	.01	.13	.00	3.52
19855.000	190.00	47.25	113.21	29.54	.00	31.41	.00	31.43	.01	.18	.00	4.41
19855.000	150.00	23.67	106.48	19.86	.00	31.18	.00	31.20	.02	.19	.00	4.70
19856.000	870.00	512.98	20.38	336.63	31.40	32.97	.00	32.97	.80	.00	.00	.10
19856.000	760.00	453.45	17.11	289.44	31.40	32.80	.00	32.80	.00	.00	.00	.10
19856.000	630.00	382.24	13.34	234.42	31.40	32.60	.00	32.60	.00	.00	.00	.11
19856.000	450.00	282.58	8.22	159.20	31.40	32.25	.00	32.26	.00	.00	.00	.12
19856.000	340.00	217.55	5.16	117.29	31.40	31.99	.00	31.99	.00	.00	.00	.15
19856.000	190.00	114.77	3.91	71.32	31.40	31.43	.00	31.43	.00	.00	.00	.39
19856.000	150.00	78.97	5.51	65.52	31.40	31.19	.00	31.20	.01	.00	.00	.78
19894.000	870.00	512.48	20.45	337.07	31.40	32.97	.00	32.97	.00	.00	.00	.10
19894.000	760.00	452.94	17.18	289.88	31.40	32.80	.00	32.80	.00	.00	.00	.10
19894.000	630.00	381.75	13.41	234.84	31.40	32.60	.00	32.60	.00	.00	.00	.10
19894.000	450.00	282.12	8.28	159.59	31.40	32.25	.00	32.26	.00	.00	.00	.12
19894.000	340.00	217.38	5.23	117.39	31.40	31.99	.00	31.99	.00	.00	.00	.14
19894.000	190.00	115.48	3.77	70.74	31.40	31.43	.00	31.43	.00	.00	.00	.37
19894.000	150.00	80.10	5.26	64.64	31.40	31.20	.00	31.20	.01	.00	.00	.71
19895.000	870.00	393.22	218.42	258.36	.00	32.96	.00	32.97	.01	.00	.00	3.77
19895.000	760.00	340.01	202.65	217.34	.00	32.80	.00	32.81	.01	.00	.00	3.71
19895.000	630.00	277.16	182.57	170.26	.00	32.59	.00	32.60	.01	.00	.00	3.58
19895.000	450.00	189.17	154.00	106.82	.00	32.25	.00	32.26	.01	.00	.00	3.48
19895.000	340.00	133.30	134.76	71.94	.00	31.99	.00	32.00	.01	.00	.00	3.45
19895.000	190.00	48.26	111.97	29.77	.00	31.42	.00	31.44	.01	.00	.00	4.26
19895.000	150.00	24.65	105.24	20.12	.00	31.19	.00	31.21	.02	.00	.00	4.53
21660.000	630.00	214.61	131.05	284.34	.00	33.34	.00	33.35	.00	.37	.00	1.20
21660.000	560.00	187.97	118.82	253.21	.00	33.16	.00	33.16	.00	.36	.00	1.15
21660.000	470.00	154.29	102.67	213.04	.00	32.93	.00	32.94	.00	.33	.00	1.05
21660.000	340.00	106.95	78.37	154.68	.00	32.55	.00	32.55	.00	.29	.00	.86
21660.000	250.00	75.25	60.75	114.00	.00	32.26	.00	32.26	.00	.26	.00	.70
21660.000	140.00	39.62	38.16	62.22	.00	31.68	.00	31.68	.00	.24	.00	.56
21660.000	110.00	30.46	31.76	47.78	.00	31.45	.00	31.45	.00	.24	.00	.53
21860.000	630.00	303.70	30.65	295.65	.00	33.35	.00	33.35	.00	.01	.00	.22
21860.000	560.00	269.79	28.13	262.07	.00	33.17	.00	33.17	.00	.01	.00	.21
21860.000	470.00	226.24	24.71	219.05	.00	32.94	.00	32.94	.00	.01	.00	.19
21860.000	340.00	163.39	19.59	157.02	.00	32.56	.00	32.56	.00	.01	.00	.17
21860.000	250.00	.00	250.00	.00	.00	32.10	.00	32.39	.29	.04	.09	41.48
21860.000	140.00	.00	140.00	.00	.00	31.62	.00	31.75	.12	.03	.04	21.50
21860.000	110.00	.00	110.00	.00	.00	31.42	.00	31.50	.09	.03	.03	16.97

SECNO	Q	QLOB	QCH	QROB	ELTRD	CWSEL	CRIMS	EG	HV	HL	QLOSS	10K*S
21861.000	630.00	295.02	47.20	287.78	32.60	33.35	.00	33.36	.01	.00	.01	1.71
21861.000	560.00	238.56	96.97	224.47	32.60	33.16	.00	33.19	.03	.00	.01	5.16
21861.000	470.00	.00	470.00	.00	32.60	32.10	31.64	33.79	1.69	.00	.85	121.14
21861.000	340.00	.00	340.00	.00	32.60	32.11	31.22	33.00	.89	.00	.44	63.39
21861.000	250.00	.00	250.00	.00	32.60	32.01	30.74	32.49	.48	.00	.09	34.27
21861.000	140.00	.00	140.00	.00	32.60	31.61	30.09	31.77	.16	.00	.02	7.03
21861.000	110.00	.00	110.00	.00	32.60	31.40	29.88	31.52	.11	.00	.01	5.26
21941.000	630.00	295.15	46.89	287.96	32.60	33.36	.00	33.37	.01	.01	.00	1.68
21941.000	560.00	243.68	83.42	232.89	32.60	33.20	.00	33.22	.02	.04	.00	3.82
21941.000	470.00	230.75	9.90	229.35	32.60	34.30	.00	34.30	.00	.00	.51	.03
21941.000	340.00	.00	340.00	.00	32.60	32.62	31.22	33.51	.89	.51	.00	63.39
21941.000	250.00	.00	250.00	.00	32.60	32.28	30.74	32.76	.48	.27	.00	34.27
21941.000	140.00	.00	140.00	.00	32.60	31.67	30.09	31.82	.15	.05	.00	6.70
21941.000	110.00	.00	110.00	.00	32.60	31.45	29.88	31.56	.11	.04	.00	5.06
21942.000	630.00	303.71	30.57	295.72	.00	33.38	.00	33.38	.00	.00	.00	.22
21942.000	560.00	269.84	27.84	262.31	.00	33.23	.00	33.23	.00	.00	.01	.20
21942.000	470.00	227.10	20.11	222.79	.00	34.30	.00	34.30	.00	.00	.00	.05
21942.000	340.00	164.09	15.52	160.39	.00	33.77	.00	33.77	.00	.00	.27	.04
21942.000	250.00	.00	250.00	.00	.00	32.62	.00	32.84	.22	.00	.08	25.57
21942.000	140.00	.00	140.00	.00	.00	31.72	.00	31.83	.12	.00	.01	19.31
21942.000	110.00	.00	110.00	.00	.00	31.48	.00	31.57	.08	.00	.01	15.61
22142.000	630.00	292.63	54.76	282.62	.00	33.38	.00	33.38	.00	.00	.00	.20
22142.000	560.00	259.85	49.67	250.47	.00	33.23	.00	33.23	.00	.00	.00	.19
22142.000	470.00	219.28	37.23	213.50	.00	34.30	.00	34.30	.00	.00	.00	.05
22142.000	340.00	158.26	28.27	153.47	.00	33.77	.00	33.77	.00	.00	.00	.04
22142.000	250.00	115.73	23.28	110.99	.00	32.91	.00	32.91	.00	.00	.07	.05
22142.000	140.00	64.46	16.66	58.88	.00	31.87	.00	31.87	.00	.01	.03	.08
22142.000	110.00	50.84	14.49	44.67	.00	31.60	.00	31.60	.00	.01	.03	.09

MARSH GULLY START AT N

SUMMARY PRINTOUT

SECNO	XLCH	ELMIN	TOPWID	SSTA	ENDST	STENCL	STENCR	AREA	VCH	K*XNL	K*XNCH	K*XNR
4150.000	.00	14.50	392.73	1408.26	1800.99	.00	.00	1070.69	4.70	120.00	50.00	120.00
4150.000	.00	14.50	373.00	1416.97	1789.97	.00	.00	963.90	4.58	120.00	50.00	120.00
4150.000	.00	14.50	346.64	1428.33	1774.98	.00	.00	833.08	4.44	120.00	50.00	120.00
4150.000	.00	14.50	300.61	1447.45	1758.11	.00	.00	633.46	4.15	120.00	50.00	120.00
4150.000	.00	14.50	237.41	1467.24	1704.66	.00	.00	501.76	3.93	120.00	50.00	120.00
4150.000	.00	14.50	172.91	1506.76	1681.92	.00	.00	267.54	3.39	120.00	50.00	120.00
4150.000	.00	14.50	136.81	1516.26	1672.25	.00	.00	187.31	3.12	120.00	50.00	120.00
5700.000	1550.00	17.10	630.54	1363.31	1993.86	.00	.00	1263.56	3.85	120.00	50.00	120.00
5700.000	1550.00	17.10	571.20	1402.97	1974.18	.00	.00	1110.17	3.80	120.00	50.00	120.00
5700.000	1550.00	17.10	519.88	1429.66	1949.54	.00	.00	935.45	3.71	120.00	50.00	120.00
5700.000	1550.00	17.10	428.09	1477.39	1905.48	.00	.00	663.98	3.54	120.00	50.00	120.00
5700.000	1550.00	17.10	360.24	1511.50	1871.75	.00	.00	480.69	3.39	120.00	50.00	120.00
5700.000	1550.00	17.10	84.89	1583.85	1714.96	.00	.00	156.77	2.74	120.00	50.00	120.00
5700.000	1550.00	17.10	29.34	1685.37	1714.71	.00	.00	128.56	2.33	120.00	50.00	120.00
5701.000	1.00	17.10	666.58	1341.71	2008.29	.00	.00	1297.21	.81	20.00	30.00	20.00
5701.000	1.00	17.10	602.01	1382.83	1984.85	.00	.00	1141.15	.85	20.00	30.00	20.00
5701.000	1.00	17.10	541.37	1418.49	1959.86	.00	.00	956.40	.91	20.00	30.00	20.00
5701.000	1.00	17.10	450.61	1465.68	1916.29	.00	.00	675.48	1.08	20.00	30.00	20.00
5701.000	1.00	17.10	379.59	1502.77	1882.36	.00	.00	485.41	1.35	20.00	30.00	20.00
5701.000	1.00	17.10	77.66	1585.96	1714.94	.00	.00	119.99	3.54	20.00	30.00	20.00
5701.000	1.00	17.10	29.34	1685.37	1714.70	.00	.00	111.33	2.69	20.00	30.00	20.00
5719.000	18.00	17.10	669.39	1340.31	2009.69	.00	.00	1302.84	.81	20.00	30.00	20.00
5719.000	18.00	17.10	604.14	1381.38	1985.52	.00	.00	1146.43	.84	20.00	30.00	20.00
5719.000	18.00	17.10	542.85	1417.72	1960.57	.00	.00	961.38	.90	20.00	30.00	20.00
5719.000	18.00	17.10	452.31	1464.80	1917.11	.00	.00	680.29	1.07	20.00	30.00	20.00
5719.000	18.00	17.10	381.87	1501.74	1883.60	.00	.00	492.07	1.33	20.00	30.00	20.00
5719.000	18.00	17.10	90.36	1582.25	1714.96	.00	.00	123.41	3.50	20.00	30.00	20.00
5719.000	18.00	17.10	29.35	1685.36	1714.71	.00	.00	111.60	2.69	20.00	30.00	20.00
5720.000	1.00	17.10	653.29	1348.35	2001.65	.00	.00	1321.13	3.71	120.00	50.00	120.00
5720.000	1.00	17.10	592.12	1389.60	1981.72	.00	.00	1167.14	3.65	120.00	50.00	120.00
5720.000	1.00	17.10	534.73	1421.94	1956.67	.00	.00	984.31	3.57	120.00	50.00	120.00
5720.000	1.00	17.10	444.10	1469.07	1913.17	.00	.00	707.54	3.39	120.00	50.00	120.00
5720.000	1.00	17.10	375.00	1504.84	1879.84	.00	.00	522.35	3.23	120.00	50.00	120.00
5720.000	1.00	17.10	112.58	1576.33	1716.98	.00	.00	169.26	2.66	120.00	50.00	120.00
5720.000	1.00	17.10	29.38	1685.35	1714.72	.00	.00	130.10	2.31	120.00	50.00	120.00
9750.000	4030.00	24.40	643.44	1594.95	2238.38	.00	.00	739.88	1.59	120.00	50.00	120.00
9750.000	4030.00	24.40	601.87	1618.88	2220.75	.00	.00	673.89	1.69	120.00	50.00	120.00
9750.000	4030.00	24.40	551.42	1649.15	2200.57	.00	.00	604.08	1.83	120.00	50.00	120.00
9750.000	4030.00	24.40	469.29	1705.95	2175.24	.00	.00	476.60	2.01	120.00	50.00	120.00
9750.000	4030.00	24.40	426.61	1729.66	2156.27	.00	.00	391.64	2.16	120.00	50.00	120.00
9750.000	4030.00	24.40	194.67	1849.96	2044.63	.00	.00	100.70	2.50	120.00	50.00	120.00
9750.000	4030.00	24.40	9.70	1995.09	2004.79	.00	.00	24.60	2.85	120.00	50.00	120.00

SECNO	XLCH	ELMIN	TOPWID	SSTA	ENDST	STENCL	STENCR	AREA	VCH	K*XNL	K*XNCH	K*XNR
12150.000	2400.00	24.90	1027.17	1000.00	2785.34	.00	.00	2056.81	.54	120.00	50.00	120.00
12150.000	2400.00	24.90	1021.03	1000.00	2783.24	.00	.00	1979.39	.55	120.00	50.00	120.00
12150.000	2400.00	24.90	1014.50	1000.00	2781.01	.00	.00	1897.63	.56	120.00	50.00	120.00
12150.000	2400.00	24.90	998.93	1000.00	2775.69	.00	.00	1704.67	.56	120.00	50.00	120.00
12150.000	2400.00	24.90	986.19	1000.00	2771.33	.00	.00	1548.96	.56	120.00	50.00	120.00
12150.000	2400.00	24.90	901.81	1023.70	2750.58	.00	.00	839.43	.51	120.00	50.00	120.00
12150.000	2400.00	24.90	764.34	1051.80	2707.12	.00	.00	457.80	.62	120.00	50.00	120.00
12950.000	800.00	25.60	967.25	1193.96	2161.21	.00	.00	1359.15	.86	120.00	50.00	120.00
12950.000	800.00	25.60	949.71	1196.95	2146.66	.00	.00	1290.62	.88	120.00	50.00	120.00
12950.000	800.00	25.60	935.79	1201.37	2137.16	.00	.00	1218.91	.90	120.00	50.00	120.00
12950.000	800.00	25.60	851.49	1261.75	2113.25	.00	.00	1049.68	.91	120.00	50.00	120.00
12950.000	800.00	25.60	809.59	1279.82	2093.57	.00	.00	929.52	.91	120.00	50.00	120.00
12950.000	800.00	25.60	479.09	1463.20	1953.47	.00	.00	443.59	.79	120.00	50.00	120.00
12950.000	800.00	25.60	381.95	1509.20	1904.31	.00	.00	279.45	.77	120.00	50.00	120.00
13840.000	890.00	23.60	34.72	1473.98	1508.70	.00	.00	165.63	1.93	120.00	50.00	120.00
13840.000	890.00	23.60	33.59	1475.07	1508.67	.00	.00	163.68	1.96	120.00	50.00	120.00
13840.000	890.00	23.60	33.48	1475.16	1508.64	.00	.00	162.16	2.16	120.00	50.00	120.00
13840.000	890.00	23.60	33.13	1475.42	1508.55	.00	.00	157.26	2.29	120.00	50.00	120.00
13840.000	890.00	23.60	32.85	1475.63	1508.48	.00	.00	153.37	2.28	120.00	50.00	120.00
13840.000	890.00	23.60	31.11	1476.92	1508.03	.00	.00	130.17	1.77	120.00	50.00	120.00
13840.000	890.00	23.60	30.18	1477.61	1507.79	.00	.00	118.37	1.52	120.00	50.00	120.00
13841.000	1.00	23.60	34.74	1473.97	1508.70	.00	.00	144.11	2.22	15.00	20.00	15.00
13841.000	1.00	23.60	33.59	1475.07	1508.67	.00	.00	144.03	2.22	15.00	20.00	15.00
13841.000	1.00	23.60	33.48	1475.15	1508.64	.00	.00	143.94	2.43	15.00	20.00	15.00
13841.000	1.00	23.60	33.13	1475.42	1508.55	.00	.00	143.45	2.51	15.00	20.00	15.00
13841.000	1.00	23.60	32.85	1475.63	1508.48	.00	.00	142.85	2.45	15.00	20.00	15.00
13841.000	1.00	23.60	31.11	1476.92	1508.03	.00	.00	130.19	1.77	15.00	20.00	15.00
13841.000	1.00	23.60	30.18	1477.61	1507.79	.00	.00	118.39	1.52	15.00	20.00	15.00
13879.000	38.00	23.60	35.30	1473.41	1508.71	.00	.00	144.12	2.22	15.00	20.00	15.00
13879.000	38.00	23.60	33.62	1475.06	1508.67	.00	.00	144.05	2.22	15.00	20.00	15.00
13879.000	38.00	23.60	33.52	1475.13	1508.65	.00	.00	143.97	2.43	15.00	20.00	15.00
13879.000	38.00	23.60	33.17	1475.39	1508.56	.00	.00	143.52	2.51	15.00	20.00	15.00
13879.000	38.00	23.60	32.89	1475.60	1508.49	.00	.00	142.95	2.45	15.00	20.00	15.00
13879.000	38.00	23.60	31.14	1476.90	1508.04	.00	.00	130.61	1.76	15.00	20.00	15.00
13879.000	38.00	23.60	30.21	1477.59	1507.80	.00	.00	118.71	1.52	15.00	20.00	15.00
13880.000	1.00	23.60	36.60	1472.12	1508.72	.00	.00	166.70	1.92	120.00	50.00	120.00
13880.000	1.00	23.60	33.66	1475.02	1508.68	.00	.00	164.65	1.94	120.00	50.00	120.00
13880.000	1.00	23.60	33.56	1475.10	1508.66	.00	.00	163.28	2.14	120.00	50.00	120.00
13880.000	1.00	23.60	33.21	1475.36	1508.57	.00	.00	158.30	2.27	120.00	50.00	120.00
13880.000	1.00	23.60	32.89	1475.60	1508.49	.00	.00	153.94	2.27	120.00	50.00	120.00
13880.000	1.00	23.60	31.12	1476.92	1508.03	.00	.00	130.32	1.76	120.00	50.00	120.00
13880.000	1.00	23.60	30.19	1477.60	1507.79	.00	.00	118.48	1.52	120.00	50.00	120.00

SECNO	XLCH	ELMIN	TOPWID	SSTA	ENDST	STENCL	STENCR	AREA	VCH	K*XNL	K*XNCH	K*XNR
14930.000	1050.00	25.10	516.61	1253.27	1790.15	.00	.00	653.54	1.43	120.00	50.00	120.00
14930.000	1050.00	25.10	510.67	1254.88	1788.95	.00	.00	636.97	1.46	120.00	50.00	120.00
14930.000	1050.00	25.10	520.92	1252.10	1791.01	.00	.00	665.66	1.54	120.00	50.00	120.00
14930.000	1050.00	25.10	512.60	1254.35	1789.34	.00	.00	642.33	1.63	120.00	50.00	120.00
14930.000	1050.00	25.10	494.54	1274.71	1786.32	.00	.00	601.35	1.68	120.00	50.00	120.00
14930.000	1050.00	25.10	363.91	1280.00	1772.67	.00	.00	289.11	1.97	120.00	50.00	120.00
14930.000	1050.00	25.10	285.70	1281.37	1771.30	.00	.00	155.64	2.16	120.00	50.00	120.00
16010.000	1080.00	24.10	695.99	1000.00	1702.80	.00	.00	1408.86	2.63	120.00	50.00	120.00
16010.000	1080.00	24.10	686.64	1000.00	1693.94	.00	.00	1341.15	2.41	120.00	50.00	120.00
16010.000	1080.00	24.10	681.47	1000.00	1689.05	.00	.00	1301.09	2.04	120.00	50.00	120.00
16010.000	1080.00	24.10	667.35	1000.00	1675.72	.00	.00	1193.19	1.58	120.00	50.00	120.00
16010.000	1080.00	24.10	655.48	1000.00	1664.52	.00	.00	1104.28	1.27	120.00	50.00	120.00
16010.000	1080.00	24.10	544.14	1051.34	1607.89	.00	.00	684.47	1.05	120.00	50.00	120.00
16010.000	1080.00	24.10	453.44	1124.79	1592.34	.00	.00	515.03	1.02	120.00	50.00	120.00
17930.000	1920.00	24.90	1695.00	705.00	2400.00	.00	.00	2862.16	1.19	120.00	50.00	120.00
17930.000	1920.00	24.90	1695.00	705.00	2400.00	.00	.00	2597.81	1.15	120.00	50.00	120.00
17930.000	1920.00	24.90	1586.66	707.54	2397.86	.00	.00	2306.16	1.06	120.00	50.00	120.00
17930.000	1920.00	24.90	1352.72	778.74	2337.90	.00	.00	1865.55	.93	120.00	50.00	120.00
17930.000	1920.00	24.90	1193.84	828.59	2022.43	.00	.00	1571.39	.83	120.00	50.00	120.00
17930.000	1920.00	24.90	882.57	1002.92	1885.49	.00	.00	856.94	.83	120.00	50.00	120.00
17930.000	1920.00	24.90	820.59	1031.10	1866.12	.00	.00	591.07	.98	120.00	50.00	120.00
19530.000	1600.00	26.10	960.00	800.00	1760.00	.00	.00	1737.61	1.58	120.00	50.00	120.00
19530.000	1600.00	26.10	960.00	800.00	1760.00	.00	.00	1579.50	1.53	120.00	50.00	120.00
19530.000	1600.00	26.10	960.00	800.00	1760.00	.00	.00	1387.01	1.46	120.00	50.00	120.00
19530.000	1600.00	26.10	939.62	800.00	1745.54	.00	.00	1059.64	1.38	120.00	50.00	120.00
19530.000	1600.00	26.10	877.60	800.00	1703.29	.00	.00	819.57	1.33	120.00	50.00	120.00
19530.000	1600.00	26.10	572.10	848.88	1604.63	.00	.00	349.65	1.45	120.00	50.00	120.00
19530.000	1600.00	26.10	443.42	918.74	1425.74	.00	.00	226.20	1.48	120.00	50.00	120.00
19855.000	325.00	26.10	960.00	800.00	1760.00	.00	.00	1874.22	1.45	120.00	50.00	120.00
19855.000	325.00	26.10	960.00	800.00	1760.00	.00	.00	1714.29	1.40	120.00	50.00	120.00
19855.000	325.00	26.10	960.00	800.00	1760.00	.00	.00	1517.41	1.33	120.00	50.00	120.00
19855.000	325.00	26.10	960.00	800.00	1760.00	.00	.00	1187.92	1.23	120.00	50.00	120.00
19855.000	325.00	26.10	910.68	800.00	1725.20	.00	.00	942.05	1.17	120.00	50.00	120.00
19855.000	325.00	26.10	714.40	800.00	1634.30	.00	.00	469.24	1.18	120.00	50.00	120.00
19855.000	325.00	26.10	540.47	862.39	1515.14	.00	.00	323.42	1.21	120.00	50.00	120.00
19856.000	1.00	26.10	960.00	800.00	1760.00	.00	.00	1785.30	.33	15.00	16.59	15.00
19856.000	1.00	26.10	960.00	800.00	1760.00	.00	.00	1625.37	.31	15.00	16.93	15.00
19856.000	1.00	26.10	960.00	800.00	1760.00	.00	.00	1428.48	.27	15.00	17.44	15.00
19856.000	1.00	26.10	960.00	800.00	1760.00	.00	.00	1098.99	.23	15.00	18.60	15.00
19856.000	1.00	26.10	910.79	800.00	1725.28	.00	.00	853.12	.19	15.00	19.59	15.00
19856.000	1.00	26.10	717.64	800.00	1635.27	.00	.00	389.87	.31	15.00	26.15	15.00
19856.000	1.00	26.10	543.62	860.52	1515.68	.00	.00	250.99	.44	15.00	27.00	15.00

SECNO	XLCH	ELMIN	TOPWID	SSTA	ENDST	STENCL	STENCR	AREA	VCH	K*XNL	K*XNCH	K*XNR
19894.000	38.00	26.10	960.00	800.00	1760.00	.00	.00	1799.67	.33	15.00	16.56	15.00
19894.000	38.00	26.10	960.00	800.00	1760.00	.00	.00	1639.65	.30	15.00	16.90	15.00
19894.000	38.00	26.10	960.00	800.00	1760.00	.00	.00	1442.47	.27	15.00	17.40	15.00
19894.000	38.00	26.10	960.00	800.00	1760.00	.00	.00	1113.07	.22	15.00	18.54	15.00
19894.000	38.00	26.10	914.41	800.00	1727.67	.00	.00	866.80	.19	15.00	19.54	15.00
19894.000	38.00	26.10	725.60	800.00	1637.66	.00	.00	400.15	.30	15.00	25.61	15.00
19894.000	38.00	26.10	553.11	855.76	1600.77	.00	.00	259.57	.42	15.00	27.00	15.00
19895.000	1.00	26.10	960.00	800.00	1760.00	.00	.00	1882.34	1.44	120.00	50.00	120.00
19895.000	1.00	26.10	960.00	800.00	1760.00	.00	.00	1722.42	1.39	120.00	50.00	120.00
19895.000	1.00	26.10	960.00	800.00	1760.00	.00	.00	1525.48	1.32	120.00	50.00	120.00
19895.000	1.00	26.10	960.00	800.00	1760.00	.00	.00	1196.28	1.22	120.00	50.00	120.00
19895.000	1.00	26.10	912.89	800.00	1726.67	.00	.00	950.39	1.16	120.00	50.00	120.00
19895.000	1.00	26.10	721.68	800.00	1636.48	.00	.00	479.04	1.16	120.00	50.00	120.00
19895.000	1.00	26.10	548.30	857.74	1516.49	.00	.00	332.29	1.19	120.00	50.00	120.00
21660.000	1765.00	28.70	600.00	1500.00	2100.00	.00	.00	1872.89	.85	120.00	50.00	120.00
21660.000	1765.00	28.70	600.00	1500.00	2100.00	.00	.00	1764.48	.80	120.00	50.00	120.00
21660.000	1765.00	28.70	600.00	1500.00	2100.00	.00	.00	1621.33	.74	120.00	50.00	120.00
21660.000	1765.00	28.70	600.00	1500.00	2100.00	.00	.00	1399.95	.62	120.00	50.00	120.00
21660.000	1765.00	28.70	600.00	1500.00	2100.00	.00	.00	1221.33	.53	120.00	50.00	120.00
21660.000	1765.00	28.70	554.73	1500.00	2100.00	.00	.00	884.05	.41	120.00	50.00	120.00
21660.000	1765.00	28.70	534.80	1500.00	2100.00	.00	.00	757.90	.38	120.00	50.00	120.00
21860.000	200.00	28.70	1600.00	1000.00	2600.00	.00	.00	4941.75	.39	120.00	50.00	120.00
21860.000	200.00	28.70	1600.00	1000.00	2600.00	.00	.00	4651.55	.37	120.00	50.00	120.00
21860.000	200.00	28.70	1600.00	1000.00	2600.00	.00	.00	4283.96	.34	120.00	50.00	120.00
21860.000	200.00	28.70	1600.00	1000.00	2600.00	.00	.00	3667.61	.30	120.00	50.00	120.00
21860.000	200.00	28.70	17.00	1792.00	1809.00	.00	.00	57.78	4.33	120.00	50.00	120.00
21860.000	200.00	28.70	17.00	1792.00	1809.00	.00	.00	49.69	2.82	120.00	50.00	120.00
21860.000	200.00	28.70	17.00	1792.00	1809.00	.00	.00	46.16	2.38	120.00	50.00	120.00
21861.000	1.00	28.70	1600.00	1000.00	2600.00	.00	.00	768.16	1.03	15.00	15.00	15.00
21861.000	1.00	28.70	1600.00	1000.00	2600.00	.00	.00	478.94	2.15	15.00	15.00	15.00
21861.000	1.00	28.70	1590.45	1000.00	2600.00	.00	.00	45.00	10.44	15.00	15.00	15.00
21861.000	1.00	28.70	1592.65	1000.00	2600.00	.00	.00	45.00	7.56	15.00	15.00	15.00
21861.000	1.00	28.70	1583.40	1000.00	2600.00	.00	.00	45.00	5.56	15.00	15.00	15.00
21861.000	1.00	28.70	1549.67	1000.00	2600.00	.00	.00	43.73	3.20	15.00	15.00	15.00
21861.000	1.00	28.70	1531.99	1000.00	2600.00	.00	.00	40.65	2.71	15.00	15.00	15.00
21941.000	80.00	28.70	1600.00	1000.00	2600.00	.00	.00	772.28	1.02	15.00	15.00	15.00
21941.000	80.00	28.70	1600.00	1000.00	2600.00	.00	.00	531.81	1.85	15.00	15.00	15.00
21941.000	80.00	28.70	1600.00	1000.00	2600.00	.00	.00	2284.24	.16	15.00	15.00	15.00
21941.000	80.00	28.70	1600.00	1000.00	2600.00	.00	.00	45.00	7.56	15.00	15.00	15.00
21941.000	80.00	28.70	1600.00	1000.00	2600.00	.00	.00	45.00	5.56	15.00	15.00	15.00
21941.000	80.00	28.70	1554.33	1000.00	2600.00	.00	.00	44.54	3.14	15.00	15.00	15.00
21941.000	80.00	28.70	1535.34	1000.00	2600.00	.00	.00	41.23	2.67	15.00	15.00	15.00

SECNO	XLCH	ELMIN	TOPWID	SSTA	ENDST	STENCL	STENCR	AREA	VCH	K*XNL	K*XNCH	K*XNR
21942.000	1.00	28.70	1600.00	1000.00	2600.00	.00	.00	4966.30	.39	120.00	50.00	120.00
21942.000	1.00	28.70	1600.00	1000.00	2600.00	.00	.00	4742.57	.36	120.00	50.00	120.00
21942.000	1.00	28.70	1600.00	1000.00	2600.00	.00	.00	6462.14	.21	120.00	50.00	120.00
21942.000	1.00	28.70	1600.00	1000.00	2600.00	.00	.00	5613.79	.18	120.00	50.00	120.00
21942.000	1.00	28.70	17.00	1792.00	1809.00	.00	.00	66.80	3.74	120.00	50.00	120.00
21942.000	1.00	28.70	17.00	1792.00	1809.00	.00	.00	51.32	2.73	120.00	50.00	120.00
21942.000	1.00	28.70	17.00	1792.00	1809.00	.00	.00	47.33	2.32	120.00	50.00	120.00
22142.000	200.00	28.70	1600.00	1000.00	2600.00	.00	.00	4987.55	.35	120.00	50.00	120.00
22142.000	200.00	28.70	1600.00	1000.00	2600.00	.00	.00	4741.03	.33	120.00	50.00	120.00
22142.000	200.00	28.70	1600.00	1000.00	2600.00	.00	.00	6447.16	.20	120.00	50.00	120.00
22142.000	200.00	28.70	1600.00	1000.00	2600.00	.00	.00	5607.39	.17	120.00	50.00	120.00
22142.000	200.00	28.70	1600.00	1000.00	2600.00	.00	.00	4225.51	.17	120.00	50.00	120.00
22142.000	200.00	28.70	1571.98	1000.00	2600.00	.00	.00	2571.53	.17	120.00	50.00	120.00
22142.000	200.00	28.70	1548.29	1000.00	2600.00	.00	.00	2142.11	.16	120.00	50.00	120.00

SUMMARY OF ERRORS AND SPECIAL NOTES

THIS RUN EXECUTED 07/16/89 16:48:28

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##########################################
 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
##########################################
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APPENDIX 4

HEC-2 COMPUTER MODEL OF CLEMMONS GULLY (EXISTING CONDITIONS)

Run CG3

THIS RUN EXECUTED 12/05/88 11:47:27

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******************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
******************************************

FR
T1 HARDIN COUNTY WCID NO. 1 FLOOD STUDY          JOB NO. HD-002   NOV 88   JNH
T2 EXISTING CONDITIONS 100-YEAR FLOOD            COMPUTER FILE CLEMEX2
T3 CLEMMONS GULLY     START AT 550' DOWNSTREAM OF WOODWAY BRIDGE W/ CG 100-YR Q

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.       8.        0.        0.   .000000       .00       .0        0.    23.800      .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     1.000      .000    -1.000      .000      .000      .000      .000      .000      .000      .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    150.000      .000      .000      .000      .000      .000      .000      .000      .000      .000

J5  LPRNT     NUMSEC                  ********REQUESTED SECTION NUMBERS********

    -10.000   -10.000      .000      .000      .000      .000      .000      .000      .000      .000

NC       .120      .120      .050      .100      .300      .000      .000      .000      .000      .000
QT      7.000   640.000   860.000  1650.000  2260.000  3180.000  4000.000  4740.000      .000      .000
X1      3.930    23.000  1572.000  1650.000      .000      .000      .000      .000      .000      .000
GR     27.800  1000.000    26.000  1140.000    24.000  1290.000    22.000  1530.000    20.000  1540.000
GR     18.000  1550.000    16.000  1555.000    14.000  1560.000    12.000  1570.000    10.000  1572.000
GR      7.800  1605.000    10.000  1650.000    12.000  1655.000    14.000  1658.000    16.000  1668.000
GR     18.000  1674.000    20.000  1678.000    22.000  1692.000    24.000  1900.000    26.000  2030.000
GR     26.000  2080.000    28.000  2130.000    28.000  2290.000      .000      .000      .000      .000

X1      4.029    39.000  2143.000  2158.000   680.000   400.000   550.000      .000      .000      .000
X4      2.000     9.500  2144.000    12.300  2163.000      .000      .000      .000      .000      .000
GR     29.600  1000.000    29.400  1100.000    28.900  1200.000    28.000  1300.000    27.200  1400.000
GR     25.500  1500.000    23.600  1600.000    23.300  1700.000    23.300  1800.000    23.200  1900.000
GR     22.900  2000.000    21.900  2046.000    21.900  2047.000    13.100  2055.000    12.700  2065.500
GR     12.600  2066.500    12.600  2067.500    11.800  2085.000    11.800  2086.000    11.100  2104.500
GR     11.000  2105.500    10.300  2124.000    10.200  2125.000     9.500  2143.000     8.000  2148.000
GR     10.000  2158.000    12.300  2162.000    22.100  2180.500    22.700  2181.500    22.700  2183.000
GR     23.100  2200.000    20.300  2300.000    24.800  2400.000    27.000  2500.000    27.800  2591.000
GR     27.900  2700.000    28.900  2800.000    29.300  2900.000    30.100  3000.000      .000      .000
```

MC	.015	.015	.030	.300	.500	.000	.000	.000	.000	.000
X1	4.030	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
BT	27.000	2047.000	21.900	21.900	2065.500	22.000	20.500	2065.500	22.000	12.700
BT	2066.500	22.000	12.600	2066.500	22.000	20.500	2085.000	22.100	20.600	2085.000
BT	22.100	11.800	2086.000	22.100	11.800	2086.000	22.100	20.600	2104.500	22.200
BT	20.700	2104.500	22.200	11.100	2105.500	22.200	11.000	2105.500	22.200	20.700
BT	2124.000	22.300	20.800	2124.000	22.300	10.300	2125.000	22.300	10.300	2125.000
BT	22.300	20.800	2143.000	22.400	20.900	2143.000	22.400	9.500	2144.000	22.400
BT	9.500	2144.000	22.400	20.900	2162.000	22.600	21.100	2162.000	22.600	12.300
BT	2163.000	22.600	12.300	2163.000	22.600	21.100	2180.500	22.700	22.100	2181.500
BT	22.700	22.700	.000	.000	.000	.000	.000	.000	.000	.000
X1	4.036	.000	.000	.000	30.000	30.000	30.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
MC	.120	.120	.050	.300	.500	.000	.000	.000	.000	.000
X1	4.037	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
MC	.120	.120	.050	.100	.300	.000	.000	.000	.000	.000
X1	4.144	31.000	2263.000	2397.000	630.000	490.000	570.000	.000	.000	.000
GR	29.600	1000.000	28.900	1200.000	28.100	1300.000	27.000	1400.000	26.700	1500.000
GR	27.100	1524.000	28.400	1534.000	28.200	1559.000	26.500	1567.000	25.800	1600.000
GR	25.600	1700.000	25.300	1800.000	24.700	1884.000	24.800	1900.000	22.700	2000.000
GR	21.300	2100.000	21.100	2200.000	17.300	2263.000	13.000	2280.000	10.000	2380.000
GR	18.300	2397.000	19.300	2400.000	21.300	2500.000	22.000	2760.000	24.000	2785.000
GR	26.000	2820.000	28.000	2975.000	28.000	3110.000	30.000	3155.000	30.000	3245.000
GR	30.700	3335.000	.000	.000	.000	.000	.000	.000	.000	.000
MC	.120	.120	.015	.300	.500	.000	.000	.000	.000	.000
X1	4.150	.000	.000	.000	30.000	30.000	30.000	.000	.000	.000
BT	4.000	2263.000	17.300	17.300	2280.000	16.000	13.000	2380.000	16.000	10.000
BT	2397.000	18.300	18.300	.000	.000	.000	.000	.000	.000	.000
MC	.120	.120	.050	.300	.500	.000	.000	.000	.000	.000
X1	4.156	.000	.000	.000	30.000	30.000	30.000	.000	.000	.000
MC	.120	.060	.050	.100	.300	.000	.000	.000	.000	.000
QT	7.000	640.000	860.000	1650.000	2260.000	3180.000	4000.000	4740.000	.000	.000
X1	1240.000	29.000	2105.000	2270.000	1120.000	1200.000	1500.000	.000	.000	.000
GR	30.000	1000.000	28.000	1590.000	26.000	1700.000	24.000	1795.000	22.000	1895.000
GR	20.000	2080.000	18.000	2085.000	16.000	2090.000	14.000	2100.000	13.400	2105.000
GR	11.100	2117.000	10.600	2190.000	11.800	2265.000	13.700	2270.000	14.000	2275.000
GR	16.000	2280.000	18.000	2290.000	20.000	2295.000	22.000	2310.000	24.000	2335.000
GR	26.000	2360.000	26.000	2420.000	26.000	2425.000	28.000	2605.000	30.000	2620.000
GR	31.700	2690.000	32.000	2965.000	32.000	3095.000	33.400	3260.000	.000	.000
NH	5.000	.120	2100.000	.040	2300.000	.050	2331.000	.040	2700.000	.120
NH	3100.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	3420.000	30.000	2300.000	2331.000	1460.000	1680.000	2180.000	.000	.000	.000
GR	28.500	1000.000	28.700	1100.000	28.400	1200.000	26.700	1300.000	24.600	1400.000
GR	22.000	1500.000	19.800	1600.000	19.000	1700.000	19.000	1731.000	15.900	1738.000
GR	14.200	1773.000	15.700	1782.000	20.000	1900.000	20.500	2000.000	20.500	2100.000
GR	20.900	2200.000	15.700	2260.000	19.600	2300.000	12.300	2320.000	15.100	2331.000

GR	19.600	2340.000	22.900	2400.000	25.000	2500.000	27.000	2600.000	28.000	2700.000
GR	27.400	2709.000	28.100	2800.000	29.100	2900.000	29.600	3000.000	29.700	3100.000
NH	5.000	.120	1500.000	.040	1755.000	.050	1810.000	.040	2000.000	.120
NH	2300.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	6200.000	18.000	1755.000	1810.000	2440.000	2100.000	2780.000	.000	.000	.000
GR	26.100	1000.000	24.500	1100.000	24.000	1200.000	24.100	1300.000	23.500	1400.000
GR	22.900	1500.000	21.900	1600.000	22.500	1700.000	21.300	1755.000	16.100	1772.000
GR	14.400	1785.000	15.400	1793.000	20.700	1810.000	22.700	1900.000	24.900	2000.000
GR	26.600	2100.000	27.400	2200.000	28.300	2300.000	.000	.000	.000	.000
NH	5.000	.120	1500.000	.040	1600.000	.050	1623.000	.040	2000.000	.120
NH	3400.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	8140.000	29.000	1600.000	1647.000	1620.000	1980.000	1940.000	.000	.000	.000
X4	3.000	19.400	1607.000	15.900	1623.000	19.500	1639.000	.000	.000	.000
GR	30.500	1000.000	30.500	1100.000	31.500	1200.000	31.600	1300.000	30.200	1400.000
GR	27.700	1500.000	27.600	1600.000	16.100	1613.000	15.900	1622.000	15.900	1636.000
GR	28.200	1647.000	26.500	1700.000	25.900	1800.000	26.400	1900.000	26.400	2000.000
GR	24.300	2100.000	25.100	2200.000	27.600	2300.000	27.900	2400.000	28.100	2500.000
GR	28.400	2600.000	28.500	2700.000	28.400	2800.000	28.500	2900.000	28.300	3000.000
GR	28.300	3100.000	28.400	3200.000	28.500	3300.000	29.000	3400.000	.000	.000
NC	.000	.000	.000	.300	.500	.000	.000	.000	.000	.000
X1	8141.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
BT	12.000	1600.000	27.600	27.600	1607.000	27.700	19.400	1607.000	27.700	25.400
BT	1613.000	27.800	25.500	1622.000	27.900	25.600	1622.000	27.900	15.900	1623.000
BT	27.900	15.900	1623.000	27.900	25.600	1636.000	28.100	26.800	1639.000	28.100
BT	26.800	1639.000	28.100	19.500	1647.000	28.200	28.200	.000	.000	.000
X1	8159.000	.000	.000	.000	18.000	18.000	18.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
X1	8160.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
NC	.120	.120	.050	.100	.300	.000	.000	.000	.000	.000
QT	7.000	540.000	730.000	1380.000	1890.000	2650.000	3350.000	3970.000	.000	.000
X1	13310.000	25.000	2232.000	2268.000	2600.000	3200.000	5150.000	.000	.000	.000
GR	27.700	1000.000	27.300	1100.000	27.600	1200.000	28.000	1300.000	27.500	1400.000
GR	27.200	1500.000	26.900	1600.000	27.000	1700.000	26.800	1800.000	25.200	1900.000
GR	24.800	2000.000	24.800	2100.000	24.400	2200.000	25.300	2232.000	18.800	2246.000
GR	19.600	2261.000	24.900	2268.000	25.200	2300.000	26.500	2400.000	27.600	2500.000
GR	28.000	2600.000	28.300	2700.000	28.700	2800.000	29.200	2900.000	29.400	3000.000
X1	15410.000	27.000	2134.000	2155.000	2050.000	2000.000	2100.000	.000	.000	.000
GR	29.300	1000.000	29.600	1100.000	29.600	1200.000	29.400	1300.000	29.100	1400.000
GR	28.800	1500.000	28.400	1600.000	27.900	1700.000	27.900	1800.000	27.800	1900.000
GR	27.100	2000.000	27.000	2100.000	26.100	2134.000	19.400	2136.000	21.200	2151.000
GR	25.800	2155.000	26.300	2200.000	26.700	2300.000	27.300	2400.000	28.000	2500.000
GR	27.700	2600.000	28.000	2700.000	27.800	2800.000	27.900	2900.000	28.100	3000.000
GR	28.200	3100.000	27.600	3200.000	.000	.000	.000	.000	.000	.000

X1	16560.000	27.000	1487.000	1512.000	900.000	1100.000	1150.000	.000	.000	.000
GR	29.000	500.000	28.400	1000.000	28.500	1050.000	28.500	1100.000	28.100	1150.000
GR	28.000	1200.000	27.800	1250.000	27.300	1300.000	27.000	1350.000	26.700	1400.000
GR	26.100	1450.000	26.100	1460.000	24.300	1487.000	19.900	1492.000	19.300	1500.000
GR	20.000	1508.000	23.600	1512.000	26.300	1544.000	26.300	1550.000	26.700	1600.000
GR	26.800	1650.000	27.200	1700.000	27.700	1750.000	28.400	1800.000	28.400	1850.000
GR	28.600	1900.000	28.500	1950.000	28.300	2000.000	29.000	2500.000	.000	.000
NH	5.000	.040	2000.000	.120	2200.000	.050	2220.000	.120	2400.000	.040
NH	3200.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	19490.000	30.000	2200.000	2220.000	2150.000	2450.000	2930.000	.000	.000	.000
GR	30.600	1000.000	31.000	1100.000	30.700	1200.000	30.400	1300.000	31.000	1400.000
GR	30.600	1500.000	30.800	1600.000	30.900	1700.000	30.600	1800.000	30.200	1900.000
GR	29.200	2000.000	29.000	2100.000	26.300	2200.000	21.100	2202.000	21.100	2208.000
GR	21.100	2208.500	21.700	2214.500	21.700	2215.000	21.700	2218.000	26.400	2220.000
GR	27.800	2300.000	28.700	2400.000	28.900	2500.000	28.700	2600.000	28.500	2700.000
GR	28.600	2800.000	28.500	2900.000	28.900	3000.000	29.100	3100.000	29.200	3200.000
NC	.000	.000	.000	.300	.500	.000	.000	.000	.000	.000
X1	19491.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
BT	13.000	2100.000	29.000	29.000	2200.000	26.600	24.600	2208.000	26.600	24.600
BT	2208.000	26.600	21.100	2208.500	26.600	21.100	2208.500	26.600	24.600	2214.500
BT	26.600	24.600	2214.500	26.600	21.700	2215.000	26.600	21.700	2215.000	26.600
BT	24.600	2218.000	26.500	24.500	2220.000	26.500	24.500	2300.000	27.800	27.800
X1	19509.000	.000	.000	.000	18.000	18.000	18.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
X1	19510.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
NC	.000	.000	.000	.100	.300	.000	.000	.000	.000	.000
NH	5.000	.040	1820.000	.120	2437.000	.050	2456.000	.120	3096.000	.040
NH	4362.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	23230.000	58.000	2437.000	2456.000	2750.000	3100.000	3720.000	.000	.000	.000
GR	32.500	1000.000	32.100	1012.000	31.800	1062.000	31.600	1162.000	31.000	1262.000
GR	30.400	1362.000	30.400	1462.000	30.100	1562.000	30.000	1662.000	29.800	1762.000
GR	30.200	1820.000	29.400	1862.000	29.300	1872.000	26.700	1887.000	29.200	1908.000
GR	32.100	1931.000	31.900	1941.000	29.600	1948.000	29.100	1962.000	29.200	2062.000
GR	28.400	2162.000	28.200	2262.000	27.800	2362.000	26.300	2410.000	24.900	2413.000
GR	26.400	2417.000	25.700	2437.000	22.800	2439.000	23.900	2453.000	26.600	2456.000
GR	26.100	2462.000	27.300	2488.000	25.800	2493.000	27.100	2498.000	27.300	2510.000
GR	27.200	2512.000	25.600	2518.000	27.500	2522.000	28.200	2562.000	28.600	2662.000
GR	29.200	2762.000	29.000	2862.000	29.000	2962.000	29.200	3062.000	29.000	3096.000
GR	29.500	3162.000	29.500	3262.000	30.200	3362.000	31.300	3462.000	31.900	3562.000
GR	32.400	3662.000	32.600	3762.000	32.700	3862.000	32.600	3962.000	32.400	4062.000
GR	33.000	4162.000	32.700	4262.000	33.500	4362.000	.000	.000	.000	.000
NH	4.000	.120	1283.000	.050	1316.000	.120	1400.000	.040	1800.000	.000
X1	24780.000	27.000	1283.000	1316.000	1500.000	1550.000	1550.000	.000	.000	.000
GR	29.700	1000.000	29.700	1050.000	29.600	1100.000	29.800	1150.000	29.500	1200.000
GR	29.200	1254.000	27.900	1283.000	25.900	1289.000	24.200	1293.000	24.000	1300.000
GR	24.500	1306.000	25.900	1310.000	27.200	1316.000	28.900	1358.000	29.500	1371.000
GR	29.800	1400.000	29.900	1450.000	30.000	1500.000	30.000	1550.000	29.800	1568.000

GR	30.700	1572.000	30.200	1577.000	29.900	1600.000	30.200	1650.000	30.300	1700.000
GR	30.400	1750.000	30.400	1800.000	.000	.000	.000	.000	.000	.000
NH	4.000	.120	1489.000	.050	1512.000	.120	1600.000	.040	2150.000	.000
X1	28230.000	40.000	1489.000	1512.000	3600.000	3650.000	3450.000	.000	.000	.000
GR	31.400	1000.000	31.300	1050.000	31.300	1100.000	31.000	1150.000	31.100	1200.000
GR	31.100	1250.000	30.600	1300.000	30.300	1340.000	30.700	1346.000	30.100	1350.000
GR	29.600	1400.000	28.800	1450.000	27.600	1486.000	27.900	1489.000	25.500	1495.000
GR	25.100	1500.000	25.500	1505.000	28.100	1512.000	28.500	1520.000	28.900	1525.000
GR	28.800	1550.000	28.700	1600.000	28.900	1612.000	28.200	1615.000	29.100	1618.000
GR	29.600	1650.000	29.900	1658.000	29.500	1661.000	30.200	1665.000	29.600	1668.000
GR	30.000	1700.000	30.000	1750.000	30.400	1800.000	30.600	1850.000	30.800	1900.000
GR	31.300	1950.000	31.700	2000.000	32.000	2050.000	32.500	2100.000	32.800	2150.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

THIS RUN EXECUTED 12/05/88 11:50:42

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  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION
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T1 HARDIN COUNTY WCID NO. 1 FLOOD STUDY          JOB NO. HD-002  NOV 88  JNH
T2 EXISTING CONDITIONS 50-YEAR FLOOD             COMPUTER FILE CLEMEX2
T3 CLEMMONS GULLY      START AT 550' DOWNSTREAM OF WOODWAY BRIDGE W/ CG 50-YR Q

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0.       7.       0.       0.  .000000      .00       .0       0.   22.900     .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     2.000     .000   -1.000     .000     .000     .000     .000     .000     .000     .000
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THIS RUN EXECUTED 12/05/88 11:51:19

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
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T1 HARDIN COUNTY WCID NO. 1 FLOOD STUDY          JOB NO. HD-002   NOV 88   JNH
T2 EXISTING CONDITIONS 25-YEAR FLOOD             COMPUTER FILE CLEMEX2
T3 CLEMMONS GULLY      START AT 550' DOWNSTREAM OF WOODWAY BRIDGE W/ CG 25-YR Q

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0.       6.       0.       0.  .000000      .00       .0       0.   22.200     .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     3.000     .000   -1.000     .000     .000     .000     .000     .000     .000     .000
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THIS RUN EXECUTED 12/05/88 11:51:55

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
 ERROR CORR - 01,02,03,04,05,06
 MODIFICATION - 50,51,52,53,54,55,56
 IBM-PC-XT VERSION
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T1 HARDIN COUNTY WCID NO. 1 FLOOD STUDY          JOB NO. HD-002  NOV 88  JNH
T2 EXISTING CONDITIONS 10-YEAR FLOOD             COMPUTER FILE CLEMEX2
T3 CLEMMONS GULLY     START AT 550' DOWNSTREAM OF WOODWAY BRIDGE W/ CG 10-YR Q

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0.       5.       0.       0.  .000000      .00       .0       0.   21.300     .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     4.000     .000   -1.000     .000     .000     .000     .000     .000     .000     .000
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THIS RUN EXECUTED 12/05/88 11:52:29

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
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T1 HARDIN COUNTY WCID NO. 1 FLOOD STUDY          JOB NO. HD-002   NOV 88   JNH
T2 EXISTING CONDITIONS 5-YEAR FLOOD              COMPUTER FILE CLEMEX2
T3 CLEMMONS GULLY      START AT 550' DOWNSTREAM OF WOODWAY BRIDGE W/ CG 5-YR Q

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0.       4.       0.       0.  .000000      .00       .0       0.   20.700     .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     5.000     .000   -1.000     .000     .000     .000     .000     .000     .000     .000
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THIS RUN EXECUTED 12/05/88 11:53:03

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
 ERROR CORR - 01,02,03,04,05,06
 MODIFICATION - 50,51,52,53,54,55,56
 IBM-PC-XT VERSION
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T1 HARDIN COUNTY MCID NO. 1 FLOOD STUDY          JOB NO. HD-002  NOV 88  JMH
T2 EXISTING CONDITIONS 2-YEAR FLOOD              COMPUTER FILE CLEMEX2
T3 CLEMMONS GULLY      START AT 550' DOWNSTREAM OF WOODWAY BRIDGE W/ CG 2-YR Q

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0.       3.       0.       0.  .000000      .00       .0       0.   19.800     .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     6.000     .000   -1.000     .000     .000     .000     .000     .000     .000     .000
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THIS RUN EXECUTED 12/05/88 11:53:34

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
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T1 HARDIN COUNTY WCID NO. 1 FLOOD STUDY          JOB NO. HD-002  NOV 88  JNH
T2 EXISTING CONDITIONS 1-YEAR FLOOD              COMPUTER FILE CLEMEX1
T3 CLEMMONS GULLY      START AT 550' DOWNSTREAM OF WOODWAY BRIDGE W/ CG 1-YR Q

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0.       2.       0.       0.  .000000      .00       .0       0.   19.500     .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

    15.000     .000   -1.000     .000     .000     .000     .000     .000     .000     .000
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THIS RUN EXECUTED 12/05/88 11:54:04

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*********************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

ONS GULLY START AT 5

SUMMARY PRINTOUT TABLE 150

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
3.930	.00	.00	.00	7.80	4740.00	23.80	.00	23.97	3.88	3.54	2096.28	2407.38
3.930	.00	.00	.00	7.80	4000.00	22.90	.00	23.05	3.57	3.26	1678.32	2116.24
3.930	.00	.00	.00	7.80	3180.00	22.20	.00	22.31	2.74	2.76	1478.68	1920.55
3.930	.00	.00	.00	7.80	2260.00	21.30	.00	21.36	1.79	2.13	1331.34	1690.99
3.930	.00	.00	.00	7.80	1650.00	20.70	.00	20.74	1.14	1.64	1241.34	1546.38
3.930	.00	.00	.00	7.80	860.00	19.80	.00	19.81	.41	.94	1114.34	1341.56
3.930	.00	.00	.00	7.80	640.00	19.50	.00	19.51	.25	.72	1073.68	1276.49
4.029	550.00	.00	.00	8.00	4740.00	24.14	.00	24.33	10.97	5.91	2473.61	1431.07
4.029	550.00	.00	.00	8.00	4000.00	23.20	.00	23.41	11.54	5.81	1776.32	1177.70
4.029	550.00	.00	.00	8.00	3180.00	22.43	.00	22.59	9.49	5.08	1507.59	1032.03
4.029	550.00	.00	.00	8.00	2260.00	21.45	.00	21.56	6.64	4.04	1276.89	877.07
4.029	550.00	.00	.00	8.00	1650.00	20.80	.00	20.86	4.41	3.17	1159.87	785.92
4.029	550.00	.00	.00	8.00	860.00	19.84	.00	19.86	1.68	1.85	1027.88	662.73
4.029	550.00	.00	.00	8.00	640.00	19.52	.00	19.54	1.05	1.43	987.78	624.74
4.030	1.00	21.90	22.70	8.00	4740.00	24.30	.00	24.36	1.49	1.41	2365.46	3883.67
4.030	1.00	21.90	22.70	8.00	4000.00	23.33	.00	23.44	2.43	1.72	1612.89	2565.56
4.030	1.00	21.90	22.70	8.00	3180.00	22.51	.00	22.61	2.40	1.71	1297.72	2052.80
4.030	1.00	21.90	22.70	8.00	2260.00	21.50	.00	21.57	1.05	1.33	1149.57	2201.14
4.030	1.00	21.90	22.70	8.00	1650.00	20.84	.00	20.87	.50	1.21	1097.50	2339.36
4.030	1.00	21.90	22.70	8.00	860.00	19.85	.00	19.86	.13	.59	978.12	2418.99
4.030	1.00	21.90	22.70	8.00	640.00	19.53	.00	19.54	.08	.46	939.32	2291.54
4.036	30.00	21.90	22.70	8.00	4740.00	24.30	.00	24.37	1.47	1.41	2375.10	3904.18
4.036	30.00	21.90	22.70	8.00	4000.00	23.34	.00	23.45	2.40	1.71	1624.22	2581.13
4.036	30.00	21.90	22.70	8.00	3180.00	22.52	.00	22.62	2.39	1.68	1301.14	2056.37
4.036	30.00	21.90	22.70	8.00	2260.00	21.51	.00	21.57	1.05	1.33	1150.54	2201.40
4.036	30.00	21.90	22.70	8.00	1650.00	20.84	.00	20.87	.50	1.22	1098.15	2330.61
4.036	30.00	21.90	22.70	8.00	860.00	19.85	.00	19.86	.13	.59	979.24	2422.68
4.036	30.00	21.90	22.70	8.00	640.00	19.53	.00	19.54	.08	.46	940.47	2295.30

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
4.037	1.00	.00	.00	8.00	4740.00	24.25	.00	24.42	10.46	5.80	2559.95	1465.56
4.037	1.00	.00	.00	8.00	4000.00	23.30	.00	23.49	11.15	5.74	1824.46	1198.05
4.037	1.00	.00	.00	8.00	3180.00	22.49	.00	22.65	9.31	5.04	1524.32	1042.21
4.037	1.00	.00	.00	8.00	2260.00	21.49	.00	21.59	6.54	4.02	1286.08	883.78
4.037	1.00	.00	.00	8.00	1650.00	20.82	.00	20.89	4.36	3.16	1165.24	790.41
4.037	1.00	.00	.00	8.00	860.00	19.84	.00	19.87	1.67	1.85	1030.46	665.19
4.037	1.00	.00	.00	8.00	640.00	19.53	.00	19.54	1.04	1.43	989.88	626.70
4.144	570.00	.00	.00	10.00	4740.00	24.60	.00	24.67	2.17	2.30	3927.83	3221.23
4.144	570.00	.00	.00	10.00	4000.00	23.69	.00	23.76	2.27	2.24	3148.13	2656.35
4.144	570.00	.00	.00	10.00	3180.00	22.83	.00	22.89	2.10	2.04	2454.55	2193.80
4.144	570.00	.00	.00	10.00	2260.00	21.73	.00	21.77	1.72	1.72	1669.28	1723.70
4.144	570.00	.00	.00	10.00	1650.00	20.99	.00	21.02	1.25	1.39	1354.91	1474.91
4.144	570.00	.00	.00	10.00	860.00	19.91	.00	19.92	.54	.84	1087.29	1165.67
4.144	570.00	.00	.00	10.00	640.00	19.57	.00	19.57	.35	.65	1019.01	1076.67
4.150	30.00	16.00	18.30	10.00	4740.00	24.55	.00	24.74	.84	3.73	3358.44	5158.26
4.150	30.00	16.00	18.30	10.00	4000.00	23.63	.00	23.82	.95	3.66	2579.26	4108.16
4.150	30.00	16.00	18.30	10.00	3180.00	22.78	.00	22.94	.96	3.40	1894.18	3238.23
4.150	30.00	16.00	18.30	10.00	2260.00	21.69	.00	21.82	.96	3.00	1118.21	2309.61
4.150	30.00	16.00	18.30	10.00	1650.00	20.96	.00	21.06	.84	2.56	819.29	1795.28
4.150	30.00	16.00	18.30	10.00	860.00	19.89	.00	19.94	.54	1.73	560.97	1169.68
4.150	30.00	16.00	18.30	10.00	640.00	19.56	.00	19.59	.42	1.42	493.44	993.41
4.156	30.00	.00	.00	10.00	4740.00	24.72	.00	24.78	2.06	2.26	4034.69	3301.62
4.156	30.00	.00	.00	10.00	4000.00	23.80	.00	23.86	2.16	2.20	3244.50	2723.82
4.156	30.00	.00	.00	10.00	3180.00	22.93	.00	22.98	2.00	2.01	2537.30	2246.65
4.156	30.00	.00	.00	10.00	2260.00	21.81	.00	21.86	1.66	1.70	1719.62	1754.55
4.156	30.00	.00	.00	10.00	1650.00	21.05	.00	21.08	1.22	1.38	1372.99	1494.41
4.156	30.00	.00	.00	10.00	860.00	19.94	.00	19.95	.53	.83	1095.53	1176.01
4.156	30.00	.00	.00	10.00	640.00	19.59	.00	19.60	.35	.65	1024.96	1084.69
1240.000	1500.00	.00	.00	10.60	4740.00	24.95	.00	24.99	1.09	1.78	3773.53	4540.65
1240.000	1500.00	.00	.00	10.60	4000.00	24.04	.00	24.08	1.03	1.66	3255.28	3935.81
1240.000	1500.00	.00	.00	10.60	3180.00	23.14	.00	23.17	.87	1.45	2793.70	3401.78
1240.000	1500.00	.00	.00	10.60	2260.00	21.98	.00	22.01	.66	1.17	2271.15	2790.02
1240.000	1500.00	.00	.00	10.60	1650.00	21.17	.00	21.19	.46	.94	1973.82	2424.46
1240.000	1500.00	.00	.00	10.60	860.00	19.99	.00	20.00	.20	.56	1649.72	1941.25
1240.000	1500.00	.00	.00	10.60	640.00	19.62	.00	19.63	.13	.44	1570.51	1801.65
3420.000	2180.00	.00	.00	12.30	4740.00	25.22	.00	25.23	1.58	1.68	5671.60	3774.31
3420.000	2180.00	.00	.00	12.30	4000.00	24.32	.00	24.33	1.94	1.75	4682.26	2870.85
3420.000	2180.00	.00	.00	12.30	3180.00	23.40	.00	23.42	2.32	1.78	3741.34	2089.08
3420.000	2180.00	.00	.00	12.30	2260.00	22.22	.00	22.23	3.06	1.85	2642.00	1291.57
3420.000	2180.00	.00	.00	12.30	1650.00	21.36	.00	21.38	3.76	1.88	1897.64	850.47
3420.000	2180.00	.00	.00	12.30	860.00	20.08	.00	20.10	3.99	1.66	996.89	430.54
3420.000	2180.00	.00	.00	12.30	640.00	19.68	.00	19.70	3.47	1.46	819.39	343.67

THIS RUN EXECUTED 01/16/89 18:59:51

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**********************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
**********************************************

T1 HARDIN COUNTY WCID NO. 1 FLOOD STUDY            JOB HD-002   DEC 88   JNH
T2 EXISTING CONDITIONS 5-YEAR FLOOD                COMPUTER FILE GOLEX
T3 GOLEMAN GULLY       START AT NORMAL DEPTH

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.        4.        0.        0.   .001000       .00        .0        0.   20.000      .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     5.000      .000    -1.000      .000      .000      .000      .000      .000      .000      .000
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THIS RUN EXECUTED 01/16/89 18:59:05

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**********************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
**********************************************

T1 HARDIN COUNTY WCID NO. 1 FLOOD STUDY            JOB HD-002   DEC 88   JNH
T2 EXISTING CONDITIONS 25-YEAR FLOOD               COMPUTER FILE GOLEX
T3 GOLEMAN GULLY       START AT NORMAL DEPTH

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.        6.        0.        0.   .001000       .00        .0        0.   21.000      .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

     3.000      .000    -1.000      .000      .000      .000      .000      .000      .000      .000
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THIS RUN EXECUTED 01/16/89 18:59:28

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**********************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
**********************************************

T1 HARDIN COUNTY WCID NO. 1 FLOOD STUDY            JOB HD-002   DEC 88   JNH
T2 EXISTING CONDITIONS 10-YEAR FLOOD               COMPUTER FILE GOLEX
T3 GOLEMAN GULLY       START AT NORMAL DEPTH

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0.       5.       0.       0.   .001000      .00       .0       0.   21.000     .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     4.000     .000   -1.000     .000     .000     .000     .000     .000     .000     .000
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THIS RUN EXECUTED 01/16/89 19:00:04

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**********************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
 ERROR CORR - 01,02,03,04,05,06
 MODIFICATION - 50,51,52,53,54,55,56
 IBM-PC-XT VERSION
**********************************************

T1 HARDIN COUNTY WCID NO. 1 FLOOD STUDY            JOB HD-002  DEC 88  JNH
T2 EXISTING CONDITIONS 2-YEAR FLOOD                COMPUTER FILE GOLEX
T3 GOLEMAN GULLY      START AT NORMAL DEPTH

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0.       3.       0.       0.   .001000      .00       .0       0.   20.000     .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     6.000     .000   -1.000     .000     .000     .000     .000     .000     .000     .000
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THIS RUN EXECUTED 01/16/89 19:00:16

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**********************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
**********************************************

T1 HARDIN COUNTY WCID NO. 1 FLOOD STUDY            JOB HD-002   DEC 88   JNH
T2 EXISTING CONDITIONS 1-YEAR FLOOD                COMPUTER FILE GOLEX
T3 GOLEMAN GULLY       START AT NORMAL DEPTH

J1  ICHECK    INQ       NINV      IDIR      STRT      METRIC    HVINS     Q         WSEL      FQ

       0.       2.        0.        0.   .001000       .00        .0        0.   20.000      .000

J2  NPROF     IPLOT     PRFVS     XSECV     XSECH     FN        ALLDC     IBW       CHNIM     ITRACE

    15.000      .000   -1.000      .000      .000      .000      .000      .000      .000      .000
```

THIS RUN EXECUTED 01/16/89 19:00:29

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HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
ERROR CORR - 01,02,03,04,05,06
MODIFICATION - 50,51,52,53,54,55,56
IBM-PC-XT VERSION
****

NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

AN GULLY START AT

SUMMARY PRINTOUT

SECNO	Q	QLOB	QCH	QROB	ELTRD	CWSEL	CRIWS	EG	HV	HL	QLOSS	10K*S
200.000	900.00	370.09	280.25	249.66	.00	27.17	.00	27.23	.07	.00	.00	9.99
200.000	780.00	314.61	265.27	200.11	.00	26.89	.00	26.95	.07	.00	.00	10.01
200.000	640.00	250.77	245.45	143.78	.00	26.52	.00	26.59	.07	.00	.00	9.98
200.000	460.00	169.96	215.62	74.42	.00	25.95	.00	26.02	.07	.00	.00	9.92
200.000	340.00	116.43	191.86	31.71	.00	25.44	.00	25.51	.07	.00	.00	10.05
200.000	190.00	45.96	142.20	1.84	.00	24.35	.00	24.41	.07	.00	.00	9.98
200.000	140.00	24.97	114.92	.11	.00	23.67	.00	23.73	.06	.00	.00	10.03
1650.000	900.00	81.63	298.83	519.54	.00	27.67	.00	27.69	.01	.45	.01	1.53
1650.000	780.00	60.39	283.92	435.70	.00	27.39	.00	27.41	.01	.45	.01	1.53
1650.000	640.00	39.85	264.08	336.08	.00	27.03	.00	27.04	.01	.45	.01	1.52
1650.000	460.00	21.21	232.56	206.23	.00	26.45	.00	26.46	.02	.44	.01	1.48
1650.000	340.00	12.41	203.25	124.33	.00	25.93	.00	25.94	.02	.43	.01	1.41
1650.000	190.00	2.18	138.35	49.47	.00	24.77	.00	24.79	.01	.37	.01	1.14
1650.000	140.00	.29	106.57	33.14	.00	24.06	.00	24.07	.01	.33	.01	1.01
3300.000	900.00	367.20	425.22	107.58	.00	28.14	.00	28.20	.06	.50	.01	8.56
3300.000	780.00	286.59	409.33	84.08	.00	27.87	.00	27.93	.07	.51	.02	9.15
3300.000	640.00	195.06	387.59	57.34	.00	27.50	.00	27.58	.08	.52	.02	10.02
3300.000	460.00	84.52	350.41	25.07	.00	26.93	.00	27.02	.09	.53	.02	11.59
3300.000	340.00	28.98	304.46	6.56	.00	26.39	.00	26.49	.10	.52	.03	12.53
3300.000	190.00	.01	189.99	.00	.00	25.17	.00	25.25	.08	.45	.02	12.69
3300.000	140.00	.00	140.00	.00	.00	24.42	.00	24.49	.07	.40	.02	12.78
5460.000	630.00	212.12	262.98	154.90	.00	30.22	.00	30.25	.03	2.04	.00	6.62
5460.000	550.00	174.70	247.67	127.63	.00	30.04	.00	30.07	.03	2.13	.00	6.94
5460.000	440.00	124.66	221.07	94.27	.00	29.79	.00	29.81	.03	2.23	.01	7.17
5460.000	320.00	70.99	190.44	58.57	.00	29.41	.00	29.44	.03	2.41	.01	7.98
5460.000	240.00	37.28	168.62	34.10	.00	29.07	.00	29.11	.03	2.61	.01	9.56
5460.000	130.00	2.40	125.61	1.99	.00	28.32	.00	28.37	.05	3.11	.00	17.29
5460.000	100.00	.00	100.00	.00	.00	27.92	.00	27.97	.05	3.48	.00	23.50

SECNO	Q	QLOB	QCH	QROB	ELTRD	CWSEL	CRIWS	EG	HV	HL	QLOSS	10K*S
5660.000	630.00	.00	630.00	.00	.00	30.32	.00	30.61	.29	.23	.13	24.67
5660.000	550.00	.00	550.00	.00	.00	30.16	.00	30.40	.24	.22	.10	20.90
5660.000	440.00	.00	440.00	.00	.00	29.92	.00	30.09	.17	.21	.07	15.86
5660.000	320.00	.00	320.00	.00	.00	29.56	.00	29.67	.10	.19	.04	10.99
5660.000	240.00	.00	240.00	.00	.00	29.23	.00	29.30	.07	.18	.02	8.09
5660.000	130.00	.00	130.00	.00	.00	28.51	.00	28.54	.03	.16	.01	4.69
5660.000	100.00	.00	100.00	.00	.00	28.12	.00	28.15	.02	.17	.01	4.23
5661.000	630.00	.00	630.00	.00	31.20	30.16	27.99	30.78	.62	.00	.16	35.14
5661.000	550.00	.00	550.00	.00	31.20	30.05	27.76	30.52	.47	.00	.12	26.78
5661.000	440.00	.00	440.00	.00	31.20	29.86	27.42	30.16	.30	.00	.07	17.14
5661.000	320.00	.00	320.00	.00	31.20	29.53	27.01	29.69	.16	.00	.03	9.07
5661.000	240.00	.00	240.00	.00	31.20	29.22	.00	29.31	.09	.00	.01	3.47
5661.000	130.00	.00	130.00	.00	31.20	28.50	.00	28.54	.04	.00	.01	1.70
5661.000	100.00	.00	100.00	.00	31.20	28.12	.00	28.15	.03	.00	.00	1.40
5741.000	630.00	.00	630.00	.00	31.20	30.44	27.99	31.06	.62	.28	.00	35.14
5741.000	550.00	.00	550.00	.00	31.20	30.26	27.76	30.73	.47	.21	.00	26.78
5741.000	440.00	.00	440.00	.00	31.20	29.99	27.42	30.29	.30	.14	.00	17.14
5741.000	320.00	.00	320.00	.00	31.20	29.61	27.01	29.77	.16	.07	.00	9.07
5741.000	240.00	.00	240.00	.00	31.20	29.25	.00	29.34	.09	.03	.00	3.40
5741.000	130.00	.00	130.00	.00	31.20	28.51	.00	28.55	.04	.01	.00	1.68
5741.000	100.00	.00	100.00	.00	31.20	28.13	.00	28.16	.03	.01	.00	1.39
5742.000	630.00	.00	630.00	.00	.00	30.95	.00	31.18	.23	.00	.12	16.62
5742.000	550.00	.00	550.00	.00	.00	30.62	.00	30.82	.20	.00	.08	15.48
5742.000	440.00	.00	440.00	.00	.00	30.19	.00	30.34	.15	.00	.05	13.12
5742.000	320.00	.00	320.00	.00	.00	29.69	.00	29.79	.10	.00	.02	9.97
5742.000	240.00	.00	240.00	.00	.00	29.28	.00	29.35	.07	.00	.01	7.76
5742.000	130.00	.00	130.00	.00	.00	28.53	.00	28.56	.03	.00	.00	4.61
5742.000	100.00	.00	100.00	.00	.00	28.14	.00	28.16	.02	.00	.00	4.17
5842.000	630.00	267.24	182.82	179.95	.00	31.23	.00	31.23	.01	.03	.02	1.42
5842.000	550.00	218.43	179.62	151.95	.00	30.87	.00	30.88	.01	.04	.02	1.90
5842.000	440.00	156.14	171.22	112.64	.00	30.39	.00	30.40	.01	.05	.01	2.41
5842.000	320.00	93.11	157.14	69.75	.00	29.84	.00	29.85	.01	.05	.01	3.43
5842.000	240.00	52.43	144.07	43.50	.00	29.40	.00	29.41	.02	.06	.01	4.66
5842.000	130.00	8.28	113.85	7.86	.00	28.59	.00	28.62	.03	.06	.00	8.84
5842.000	100.00	.56	98.92	.52	.00	28.20	.00	28.24	.03	.07	.00	13.24

AN GULLY START AT

SUMMARY PRINTOUT

SECNO	XLCH	ELMIN	TOPWID	SSTA	ENDST	STENCL	STENCR	AREA	VCH	K*XNL	K*XNCH	K*XNR
200.000	.00	16.70	229.28	2219.24	2448.52	.00	.00	529.26	3.02	60.00	50.00	60.00
200.000	.00	16.70	215.05	2227.72	2442.77	.00	.00	467.05	2.96	60.00	50.00	60.00
200.000	.00	16.70	196.62	2238.71	2435.33	.00	.00	392.41	2.87	60.00	50.00	60.00
200.000	.00	16.70	167.64	2255.99	2423.64	.00	.00	288.55	2.72	60.00	50.00	60.00
200.000	.00	16.70	141.52	2271.57	2413.09	.00	.00	209.09	2.60	60.00	50.00	60.00
200.000	.00	16.70	47.64	2304.34	2351.98	.00	.00	103.85	2.30	60.00	50.00	60.00
200.000	.00	16.70	29.25	2318.20	2347.45	.00	.00	78.93	2.12	60.00	50.00	60.00
1650.000	1450.00	17.30	517.50	2082.50	2600.00	.00	.00	1235.32	1.46	60.00	50.00	60.00
1650.000	1450.00	17.30	507.14	2092.86	2600.00	.00	.00	1092.04	1.43	60.00	50.00	60.00
1650.000	1450.00	17.30	478.41	2121.59	2600.00	.00	.00	910.50	1.39	60.00	50.00	60.00
1650.000	1450.00	17.30	406.21	2193.79	2600.00	.00	.00	655.04	1.31	60.00	50.00	60.00
1650.000	1450.00	17.30	307.61	2205.37	2512.98	.00	.00	454.23	1.23	60.00	50.00	60.00
1650.000	1450.00	17.30	80.26	2218.49	2298.75	.00	.00	231.96	.97	60.00	50.00	60.00
1650.000	1450.00	17.30	49.08	2226.55	2275.63	.00	.00	187.49	.85	60.00	50.00	60.00
3300.000	1650.00	19.80	360.84	1797.46	2158.30	.00	.00	621.27	2.74	60.00	50.00	60.00
3300.000	1650.00	19.80	331.20	1819.32	2150.52	.00	.00	526.90	2.76	60.00	50.00	60.00
3300.000	1650.00	19.80	290.86	1849.36	2140.22	.00	.00	414.77	2.77	60.00	50.00	60.00
3300.000	1650.00	19.80	226.41	1897.35	2123.76	.00	.00	265.83	2.78	60.00	50.00	60.00
3300.000	1650.00	19.80	136.38	1972.07	2108.44	.00	.00	168.08	2.69	60.00	50.00	60.00
3300.000	1650.00	19.80	27.07	2049.40	2076.47	.00	.00	84.17	2.26	60.00	50.00	60.00
3300.000	1650.00	19.80	21.40	2054.30	2075.70	.00	.00	67.12	2.09	60.00	50.00	60.00
5460.000	2160.00	25.30	413.65	1797.39	2211.04	.00	.00	597.80	1.80	60.00	50.00	60.00
5460.000	2160.00	25.30	386.26	1815.83	2202.09	.00	.00	526.18	1.78	60.00	50.00	60.00
5460.000	2160.00	25.30	347.26	1841.82	2189.09	.00	.00	430.84	1.72	60.00	50.00	60.00
5460.000	2160.00	25.30	291.91	1878.72	2170.64	.00	.00	312.91	1.67	60.00	50.00	60.00
5460.000	2160.00	25.30	240.98	1912.68	2153.66	.00	.00	222.44	1.68	60.00	50.00	60.00
5460.000	2160.00	25.30	120.94	1988.15	2115.93	.00	.00	83.57	1.79	60.00	50.00	60.00
5460.000	2160.00	25.30	37.74	2028.40	2066.14	.00	.00	54.67	1.83	60.00	50.00	60.00
5660.000	200.00	25.30	29.00	2040.00	2069.00	.00	.00	145.57	4.33	60.00	50.00	60.00
5660.000	200.00	25.30	29.00	2040.00	2069.00	.00	.00	141.02	3.90	60.00	50.00	60.00
5660.000	200.00	25.30	29.00	2040.00	2069.00	.00	.00	133.99	3.28	60.00	50.00	60.00
5660.000	200.00	25.30	29.00	2040.00	2069.00	.00	.00	123.57	2.59	60.00	50.00	60.00
5660.000	200.00	25.30	29.00	2040.00	2069.00	.00	.00	113.98	2.11	60.00	50.00	60.00
5660.000	200.00	25.30	29.00	2040.00	2069.00	.00	.00	92.94	1.40	60.00	50.00	60.00
5660.000	200.00	25.30	29.00	2040.00	2069.00	.00	.00	81.86	1.22	60.00	50.00	60.00
5661.000	1.00	25.30	403.99	1804.00	2208.00	.00	.00	100.00	6.30	15.00	15.00	15.00
5661.000	1.00	25.30	387.27	1815.15	2202.42	.00	.00	100.00	5.50	15.00	15.00	15.00
5661.000	1.00	25.30	358.33	1834.45	2192.78	.00	.00	100.00	4.40	15.00	15.00	15.00
5661.000	1.00	25.30	310.18	1866.55	2176.73	.00	.00	100.00	3.20	15.00	15.00	15.00
5661.000	1.00	25.30	263.77	1897.48	2161.26	.00	.00	98.13	2.45	15.00	15.00	15.00
5661.000	1.00	25.30	155.93	1969.38	2125.31	.00	.00	80.16	1.62	15.00	15.00	15.00
5661.000	1.00	25.30	95.73	2010.51	2106.25	.00	.00	70.62	1.42	15.00	15.00	15.00

SECNO	XLCH	ELMIN	TOPWID	SSTA	ENDST	STENCL	STENCR	AREA	VCH	K*XNL	K*XNCH	K*XNR
5741.000	80.00	25.30	452.19	1769.86	2222.05	.00	.00	100.00	6.30	15.00	15.00	15.00
5741.000	80.00	25.30	420.98	1792.16	2213.14	.00	.00	100.00	5.50	15.00	15.00	15.00
5741.000	80.00	25.30	378.12	1821.25	2199.38	.00	.00	100.00	4.40	15.00	15.00	15.00
5741.000	80.00	25.30	322.21	1858.53	2180.74	.00	.00	100.00	3.20	15.00	15.00	15.00
5741.000	80.00	25.30	268.53	1894.31	2162.84	.00	.00	98.92	2.43	15.00	15.00	15.00
5741.000	80.00	25.30	158.00	1968.00	2126.00	.00	.00	80.50	1.61	15.00	15.00	15.00
5741.000	80.00	25.30	98.00	2008.84	2106.84	.00	.00	70.92	1.41	15.00	15.00	15.00
5742.000	1.00	25.30	29.00	2040.00	2069.00	.00	.00	163.89	3.84	60.00	50.00	60.00
5742.000	1.00	25.30	29.00	2040.00	2069.00	.00	.00	154.31	3.56	60.00	50.00	60.00
5742.000	1.00	25.30	29.00	2040.00	2069.00	.00	.00	141.85	3.10	60.00	50.00	60.00
5742.000	1.00	25.30	29.00	2040.00	2069.00	.00	.00	127.23	2.52	60.00	50.00	60.00
5742.000	1.00	25.30	29.00	2040.00	2069.00	.00	.00	115.43	2.08	60.00	50.00	60.00
5742.000	1.00	25.30	29.00	2040.00	2069.00	.00	.00	93.41	1.39	60.00	50.00	60.00
5742.000	1.00	25.30	29.00	2040.00	2069.00	.00	.00	82.26	1.22	60.00	50.00	60.00
5842.000	100.00	25.30	598.78	1662.47	2261.26	.00	.00	1102.53	.98	60.00	50.00	60.00
5842.000	100.00	25.30	526.69	1716.65	2243.34	.00	.00	901.50	1.04	60.00	50.00	60.00
5842.000	100.00	25.30	443.45	1776.11	2219.56	.00	.00	670.76	1.12	60.00	50.00	60.00
5842.000	100.00	25.30	355.28	1836.48	2191.76	.00	.00	449.60	1.20	60.00	50.00	60.00
5842.000	100.00	25.30	289.26	1880.49	2169.75	.00	.00	307.78	1.27	60.00	50.00	60.00
5842.000	100.00	25.30	169.03	1960.65	2129.68	.00	.00	124.10	1.40	60.00	50.00	60.00
5842.000	100.00	25.30	93.64	1999.82	2110.09	.00	.00	71.04	1.51	60.00	50.00	60.00

SUMMARY OF ERRORS AND SPECIAL NOTES

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
6200.000	2780.00	.00	.00	14.40	4740.00	25.83	.00	25.90	5.37	2.85	2862.95	2046.15
6200.000	2780.00	.00	.00	14.40	4000.00	25.11	.00	25.19	7.43	3.17	2145.44	1467.56
6200.000	2780.00	.00	.00	14.40	3180.00	24.39	.00	24.50	9.94	3.44	1497.14	1008.83
6200.000	2780.00	.00	.00	14.40	2260.00	23.56	.00	23.70	13.66	3.72	915.63	611.57
6200.000	2780.00	.00	.00	14.40	1650.00	22.99	.00	23.16	15.40	3.71	639.27	420.47
6200.000	2780.00	.00	.00	14.40	860.00	21.84	.00	21.99	15.29	3.20	294.46	219.94
6200.000	2780.00	.00	.00	14.40	640.00	21.25	.00	21.37	14.01	2.81	233.53	170.99
8140.000	1940.00	.00	.00	15.90	4740.00	27.54	.00	28.07	32.33	7.21	1442.16	833.62
8140.000	1940.00	.00	.00	15.90	4000.00	27.29	.00	27.80	29.53	6.81	1273.08	736.04
8140.000	1940.00	.00	.00	15.90	3180.00	26.98	.00	27.44	25.30	6.22	1072.90	632.19
8140.000	1940.00	.00	.00	15.90	2260.00	26.50	.00	26.89	19.98	5.40	770.27	505.54
8140.000	1940.00	.00	.00	15.90	1650.00	25.86	.00	26.17	15.53	4.62	523.72	418.72
8140.000	1940.00	.00	.00	15.90	860.00	24.12	.00	24.28	9.36	3.25	264.64	281.04
8140.000	1940.00	.00	.00	15.90	640.00	23.23	.00	23.35	7.75	2.79	229.74	229.93
8141.000	1.00	27.60	28.20	15.90	4740.00	28.07	.00	28.19	39.80	3.26	1747.24	751.35
8141.000	1.00	27.60	28.20	15.90	4000.00	27.79	.00	27.92	38.35	3.55	1501.61	645.89
8141.000	1.00	27.60	28.20	15.90	3180.00	27.42	.00	27.55	36.81	3.76	1242.78	524.11
8141.000	1.00	27.60	28.20	15.90	2260.00	26.82	.00	26.97	39.67	3.91	884.26	358.80
8141.000	1.00	27.60	28.20	15.90	1650.00	25.92	.00	26.19	46.16	4.58	484.09	242.85
8141.000	1.00	27.60	28.20	15.90	860.00	24.10	.00	24.30	23.56	3.63	236.70	177.17
8141.000	1.00	27.60	28.20	15.90	640.00	23.22	.00	23.36	18.02	3.05	209.70	150.77
8159.000	18.00	27.60	28.20	15.90	4740.00	28.15	.00	28.26	36.55	3.02	1824.48	784.03
8159.000	18.00	27.60	28.20	15.90	4000.00	27.88	.00	27.99	35.15	3.27	1573.01	674.71
8159.000	18.00	27.60	28.20	15.90	3180.00	27.50	.00	27.61	33.28	3.58	1294.11	551.27
8159.000	18.00	27.60	28.20	15.90	2260.00	26.92	.00	27.05	34.97	3.67	941.90	382.18
8159.000	18.00	27.60	28.20	15.90	1650.00	26.04	.00	26.28	42.96	4.39	514.25	251.74
8159.000	18.00	27.60	28.20	15.90	860.00	24.14	.00	24.34	23.26	3.62	237.84	178.31
8159.000	18.00	27.60	28.20	15.90	640.00	23.25	.00	23.40	17.86	3.04	210.39	151.43
8160.000	1.00	.00	.00	15.90	4740.00	28.11	.00	28.31	17.65	4.88	1931.03	1128.15
8160.000	1.00	.00	.00	15.90	4000.00	27.84	.00	28.03	16.51	4.64	1673.25	984.30
8160.000	1.00	.00	.00	15.90	3180.00	27.47	.00	27.65	15.11	4.36	1391.12	818.18
8160.000	1.00	.00	.00	15.90	2260.00	26.90	.00	27.07	13.57	4.02	1018.16	613.44
8160.000	1.00	.00	.00	15.90	1650.00	26.06	.00	26.28	15.22	4.09	575.38	422.91
8160.000	1.00	.00	.00	15.90	860.00	24.20	.00	24.36	11.49	3.21	268.16	253.66
8160.000	1.00	.00	.00	15.90	640.00	23.29	.00	23.41	9.60	2.76	232.06	206.51
13310.000	5150.00	.00	.00	18.80	3970.00	30.43	.00	30.45	2.58	2.03	7044.97	2470.81
13310.000	5150.00	.00	.00	18.80	3350.00	30.08	.00	30.09	2.46	1.93	6330.70	2134.24
13310.000	5150.00	.00	.00	18.80	2650.00	29.62	.00	29.63	2.33	1.81	5407.35	1737.32
13310.000	5150.00	.00	.00	18.80	1890.00	28.98	.00	29.00	2.21	1.68	4184.36	1272.58
13310.000	5150.00	.00	.00	18.80	1380.00	28.40	.00	28.42	2.23	1.61	3140.79	923.32
13310.000	5150.00	.00	.00	18.80	730.00	27.01	.00	27.03	3.27	1.70	1269.42	403.76
13310.000	5150.00	.00	.00	18.80	540.00	26.32	.00	26.35	4.14	1.76	827.71	265.26

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
15410.000	2100.00	.00	.00	19.40	3970.00	31.07	.00	31.09	3.85	2.21	6802.81	2022.69
15410.000	2100.00	.00	.00	19.40	3350.00	30.71	.00	30.72	3.97	2.19	5996.73	1682.24
15410.000	2100.00	.00	.00	19.40	2650.00	30.24	.00	30.25	4.21	2.18	4969.14	1292.26
15410.000	2100.00	.00	.00	19.40	1890.00	29.62	.00	29.64	4.82	2.23	3612.58	860.75
15410.000	2100.00	.00	.00	19.40	1380.00	29.09	.00	29.12	5.77	2.34	2587.94	574.71
15410.000	2100.00	.00	.00	19.40	730.00	28.08	.00	28.16	10.37	2.86	931.50	226.69
15410.000	2100.00	.00	.00	19.40	540.00	27.62	.00	27.72	11.52	2.88	503.28	159.12
16560.000	1150.00	.00	.00	19.30	3970.00	31.48	.00	31.51	4.35	2.84	5366.69	1904.49
16560.000	1150.00	.00	.00	19.30	3350.00	31.11	.00	31.14	4.16	2.71	4835.01	1643.42
16560.000	1150.00	.00	.00	19.30	2650.00	30.65	.00	30.68	3.91	2.55	4163.01	1340.01
16560.000	1150.00	.00	.00	19.30	1890.00	30.05	.00	30.08	3.61	2.36	3295.02	994.86
16560.000	1150.00	.00	.00	19.30	1380.00	29.55	.00	29.58	3.38	2.20	2568.53	750.12
16560.000	1150.00	.00	.00	19.30	730.00	28.66	.00	28.69	2.79	1.87	1329.27	436.78
16560.000	1150.00	.00	.00	19.30	540.00	28.21	.00	28.24	2.49	1.70	947.42	341.99
19490.000	2930.00	.00	.00	21.10	3970.00	32.02	.00	32.03	1.29	1.30	5710.28	3501.96
19490.000	2930.00	.00	.00	21.10	3350.00	31.68	.00	31.69	1.41	1.33	4957.55	2824.85
19490.000	2930.00	.00	.00	21.10	2650.00	31.25	.00	31.26	1.60	1.38	4019.69	2093.24
19490.000	2930.00	.00	.00	21.10	1890.00	30.70	.00	30.71	1.91	1.45	2872.80	1366.71
19490.000	2930.00	.00	.00	21.10	1380.00	30.24	.00	30.25	2.17	1.49	2223.82	937.11
19490.000	2930.00	.00	.00	21.10	730.00	29.46	.00	29.47	3.22	1.70	1234.12	406.63
19490.000	2930.00	.00	.00	21.10	540.00	29.09	.00	29.13	4.56	1.96	800.64	252.92
19491.000	1.00	26.50	29.00	21.10	3970.00	32.02	.00	32.03	7.24	1.37	5649.50	1475.77
19491.000	1.00	26.50	29.00	21.10	3350.00	31.68	.00	31.69	7.72	1.37	4896.76	1206.05
19491.000	1.00	26.50	29.00	21.10	2650.00	31.25	.00	31.26	8.46	1.38	3959.00	911.26
19491.000	1.00	26.50	29.00	21.10	1890.00	30.71	.00	30.71	9.50	1.39	2824.76	613.10
19491.000	1.00	26.50	29.00	21.10	1380.00	30.24	.00	30.25	10.61	1.40	2162.89	423.67
19491.000	1.00	26.50	29.00	21.10	730.00	29.46	.00	29.48	15.23	1.54	1170.24	187.06
19491.000	1.00	26.50	29.00	21.10	540.00	29.11	.00	29.13	21.17	1.74	748.81	117.35
19509.000	18.00	26.50	29.00	21.10	3970.00	32.03	.00	32.04	7.17	1.36	5667.57	1482.58
19509.000	18.00	26.50	29.00	21.10	3350.00	31.69	.00	31.70	7.63	1.37	4916.71	1212.83
19509.000	18.00	26.50	29.00	21.10	2650.00	31.27	.00	31.28	8.34	1.37	3981.97	917.89
19509.000	18.00	26.50	29.00	21.10	1890.00	30.72	.00	30.73	9.33	1.38	2845.75	618.78
19509.000	18.00	26.50	29.00	21.10	1380.00	30.26	.00	30.27	10.35	1.39	2181.52	428.92
19509.000	18.00	26.50	29.00	21.10	730.00	29.49	.00	29.50	14.13	1.49	1207.45	194.20
19509.000	18.00	26.50	29.00	21.10	540.00	29.15	.00	29.17	19.00	1.65	792.62	123.90
19510.000	1.00	.00	.00	21.10	3970.00	32.03	.00	32.05	5.79	2.77	5741.86	1650.36
19510.000	1.00	.00	.00	21.10	3350.00	31.68	.00	31.71	5.96	2.75	4991.81	1372.59
19510.000	1.00	.00	.00	21.10	2650.00	31.26	.00	31.28	6.16	2.71	4058.32	1067.77
19510.000	1.00	.00	.00	21.10	1890.00	30.71	.00	30.74	6.30	2.63	2910.79	753.23
19510.000	1.00	.00	.00	21.10	1380.00	30.25	.00	30.28	6.22	2.53	2245.69	553.28
19510.000	1.00	.00	.00	21.10	730.00	29.48	.00	29.52	5.87	2.30	1267.64	301.34
19510.000	1.00	.00	.00	21.10	540.00	29.14	.00	29.18	5.78	2.22	855.98	224.54

SECNO	XLCH	ELTRD	ELLC	ELMIN	Q	CWSEL	CRIWS	EG	10K*S	VCH	AREA	.01K
23230.000	3720.00	.00	.00	22.80	3970.00	32.69	.00	32.70	1.11	1.24	8238.02	3775.77
23230.000	3720.00	.00	.00	22.80	3350.00	32.37	.00	32.38	1.13	1.22	7336.02	3148.53
23230.000	3720.00	.00	.00	22.80	2650.00	31.98	.00	31.98	1.17	1.20	6282.12	2452.05
23230.000	3720.00	.00	.00	22.80	1890.00	31.46	.00	31.47	1.20	1.17	5043.64	1723.68
23230.000	3720.00	.00	.00	22.80	1380.00	31.03	.00	31.03	1.25	1.15	4088.02	1233.09
23230.000	3720.00	.00	.00	22.80	730.00	30.30	.00	30.30	1.32	1.10	2585.92	635.34
23230.000	3720.00	.00	.00	22.80	540.00	29.98	.00	29.98	1.33	1.07	2023.75	467.88
24780.000	1550.00	.00	.00	24.00	3970.00	33.00	.00	33.05	6.52	2.89	2753.28	1554.27
24780.000	1550.00	.00	.00	24.00	3350.00	32.69	.00	32.73	6.35	2.77	2502.26	1329.92
24780.000	1550.00	.00	.00	24.00	2650.00	32.30	.00	32.34	6.09	2.62	2191.25	1073.55
24780.000	1550.00	.00	.00	24.00	1890.00	31.79	.00	31.83	5.91	2.45	1785.60	777.20
24780.000	1550.00	.00	.00	24.00	1380.00	31.37	.00	31.41	5.94	2.35	1448.84	566.44
24780.000	1550.00	.00	.00	24.00	730.00	30.65	.00	30.70	6.24	2.22	877.30	292.23
24780.000	1550.00	.00	.00	24.00	540.00	30.34	.00	30.38	6.51	2.17	628.22	211.58
28230.000	3450.00	.00	.00	25.10	3970.00	34.31	.00	34.33	2.21	1.74	4433.00	2673.45
28230.000	3450.00	.00	.00	25.10	3350.00	33.96	.00	33.97	2.14	1.67	4024.06	2291.73
28230.000	3450.00	.00	.00	25.10	2650.00	33.51	.00	33.52	2.05	1.57	3512.61	1852.77
28230.000	3450.00	.00	.00	25.10	1890.00	32.94	.00	32.96	1.93	1.45	2861.33	1360.05
28230.000	3450.00	.00	.00	25.10	1380.00	32.48	.00	32.49	1.83	1.34	2340.34	1020.66
28230.000	3450.00	.00	.00	25.10	730.00	31.71	.00	31.71	1.62	1.16	1516.81	574.38
28230.000	3450.00	.00	.00	25.10	540.00	31.38	.00	31.38	1.55	1.09	1194.41	434.06

ONS GULLY START AT 5

SUMMARY PRINTOUT TABLE 150

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
3.930	4740.00	23.80	.00	.00	.00	565.20	.00
3.930	4000.00	22.90	-.90	.00	.00	363.60	.00
3.930	3180.00	22.20	-.70	.00	.00	206.80	.00
3.930	2260.00	21.30	-.90	.00	.00	153.60	.00
3.930	1650.00	20.70	-.60	.00	.00	146.40	.00
3.930	860.00	19.80	-.90	.00	.00	136.60	.00
3.930	640.00	19.50	-.30	.00	.00	134.50	.00
4.029	4740.00	24.14	.00	.34	.00	814.03	550.00
4.029	4000.00	23.20	-.94	.30	.00	468.34	550.00
4.029	3180.00	22.43	-.77	.23	.00	283.03	550.00
4.029	2260.00	21.45	-.98	.15	.00	198.67	550.00
4.029	1650.00	20.80	-.65	.10	.00	159.00	550.00
4.029	860.00	19.84	-.96	.04	.00	127.56	550.00
4.029	640.00	19.52	-.31	.02	.00	126.71	550.00
4.030	4740.00	24.30	.00	.16	.00	825.68	1.00
4.030	4000.00	23.33	-.96	.13	.00	678.61	1.00
4.030	3180.00	22.51	-.82	.08	.00	291.45	1.00
4.030	2260.00	21.50	-1.01	.05	.00	201.84	1.00
4.030	1650.00	20.84	-.67	.04	.00	161.38	1.00
4.030	860.00	19.85	-.99	.01	.00	127.60	1.00
4.030	640.00	19.53	-.32	.01	.00	126.73	1.00
4.036	4740.00	24.30	.00	.01	.00	826.56	30.00
4.036	4000.00	23.34	-.96	.01	.00	684.52	30.00
4.036	3180.00	22.52	-.82	.01	.00	292.81	30.00
4.036	2260.00	21.51	-1.01	.00	.00	202.54	30.00
4.036	1650.00	20.84	-.67	.00	.00	161.83	30.00
4.036	860.00	19.85	-.99	.00	.00	127.62	30.00
4.036	640.00	19.53	-.32	.00	.00	126.76	30.00
4.037	4740.00	24.25	.00	-.05	.00	821.93	1.00
4.037	4000.00	23.30	-.95	-.05	.00	563.69	1.00
4.037	3180.00	22.49	-.81	-.03	.00	289.21	1.00
4.037	2260.00	21.49	-1.00	-.02	.00	201.46	1.00
4.037	1650.00	20.82	-.66	-.01	.00	161.04	1.00
4.037	860.00	19.84	-.98	.00	.00	127.62	1.00
4.037	640.00	19.53	-.32	.00	.00	126.76	1.00
4.144	4740.00	24.60	.00	.36	.00	885.67	570.00
4.144	4000.00	23.69	-.91	.39	.00	827.95	570.00
4.144	3180.00	22.83	-.86	.34	.00	775.96	570.00
4.144	2260.00	21.73	-1.10	.24	.00	590.75	570.00
4.144	1650.00	20.99	-.74	.16	.00	282.56	570.00
4.144	860.00	19.91	-1.08	.07	.00	210.25	570.00
4.144	640.00	19.57	-.34	.04	.00	187.38	570.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
4.150	4740.00	24.55	.00	-.06	.00	882.51	30.00
4.150	4000.00	23.63	-.91	-.06	.00	824.87	30.00
4.150	3180.00	22.78	-.86	-.05	.00	773.33	30.00
4.150	2260.00	21.69	-1.09	-.04	.00	572.04	30.00
4.150	1650.00	20.96	-.73	-.03	.00	280.40	30.00
4.150	860.00	19.89	-1.06	-.02	.00	210.31	30.00
4.150	640.00	19.56	-.34	-.01	.00	187.71	30.00
4.156	4740.00	24.72	.00	.17	.00	898.10	30.00
4.156	4000.00	23.80	-.91	.17	.00	834.92	30.00
4.156	3180.00	22.93	-.87	.15	.00	782.34	30.00
4.156	2260.00	21.81	-1.11	.12	.00	627.36	30.00
4.156	1650.00	21.05	-.76	.10	.00	286.79	30.00
4.156	860.00	19.94	-1.11	.05	.00	212.84	30.00
4.156	640.00	19.59	-.35	.03	.00	189.48	30.00
1240.000	4740.00	24.95	.00	.23	.00	596.90	1500.00
1240.000	4000.00	24.04	-.91	.24	.00	542.31	1500.00
1240.000	3180.00	23.14	-.90	.22	.00	486.32	1500.00
1240.000	2260.00	21.98	-1.16	.17	.00	413.00	1500.00
1240.000	1650.00	21.17	-.81	.12	.00	333.31	1500.00
1240.000	860.00	19.99	-1.18	.05	.00	215.13	1500.00
1240.000	640.00	19.62	-.37	.03	.00	213.16	1500.00
3420.000	4740.00	25.22	.00	.27	.00	1140.77	2180.00
3420.000	4000.00	24.32	-.90	.28	.00	1056.96	2180.00
3420.000	3180.00	23.40	-.91	.26	.00	977.33	2180.00
3420.000	2260.00	22.22	-1.19	.23	.00	895.94	2180.00
3420.000	1650.00	21.36	-.86	.19	.00	843.01	2180.00
3420.000	860.00	20.08	-1.28	.09	.00	469.10	2180.00
3420.000	640.00	19.68	-.40	.06	.00	402.62	2180.00
6200.000	4740.00	25.83	.00	.62	.00	1038.41	2780.00
6200.000	4000.00	25.11	-.72	.79	.00	950.89	2780.00
6200.000	3180.00	24.39	-.72	.99	.00	857.32	2780.00
6200.000	2260.00	23.56	-.84	1.34	.00	548.40	2780.00
6200.000	1650.00	22.99	-.56	1.63	.00	428.37	2780.00
6200.000	860.00	21.84	-1.16	1.75	.00	130.73	2780.00
6200.000	640.00	21.25	-.58	1.57	.00	79.69	2780.00
8140.000	4740.00	27.54	.00	1.71	.00	676.70	1940.00
8140.000	4000.00	27.29	-.25	2.18	.00	658.23	1940.00
8140.000	3180.00	26.98	-.31	2.59	.00	635.65	1940.00
8140.000	2260.00	26.50	-.48	2.94	.00	598.84	1940.00
8140.000	1650.00	25.86	-.64	2.86	.00	248.23	1940.00
8140.000	860.00	24.12	-1.74	2.28	.00	40.26	1940.00
8140.000	640.00	23.23	-.89	1.98	.00	38.70	1940.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
8141.000	4740.00	28.07	.00	.53	.00	993.62	1.00
8141.000	4000.00	27.79	-.28	.50	.00	854.72	1.00
8141.000	3180.00	27.42	-.37	.44	.00	667.45	1.00
8141.000	2260.00	26.82	-.60	.33	.00	623.86	1.00
8141.000	1650.00	25.92	-.91	.06	.00	259.88	1.00
8141.000	860.00	24.10	-1.82	-.02	.00	40.24	1.00
8141.000	640.00	23.22	-.88	-.01	.00	38.69	1.00
8159.000	4740.00	28.15	.00	.08	.00	1030.37	18.00
8159.000	4000.00	27.88	-.28	.08	.00	889.13	18.00
8159.000	3180.00	27.50	-.38	.08	.00	673.44	18.00
8159.000	2260.00	26.92	-.58	.09	.00	631.08	18.00
8159.000	1650.00	26.04	-.88	.12	.00	313.79	18.00
8159.000	860.00	24.14	-1.89	.04	.00	40.30	18.00
8159.000	640.00	23.25	-.89	.03	.00	38.73	18.00
8160.000	4740.00	28.11	.00	-.04	.00	1018.27	1.00
8160.000	4000.00	27.84	-.27	-.04	.00	874.15	1.00
8160.000	3180.00	27.47	-.37	-.03	.00	671.18	1.00
8160.000	2260.00	26.90	-.57	-.02	.00	629.34	1.00
8160.000	1650.00	26.06	-.84	.02	.00	319.02	1.00
8160.000	860.00	24.20	-1.86	.06	.00	40.42	1.00
8160.000	640.00	23.29	-.91	.03	.00	38.80	1.00
13310.000	3970.00	30.43	.00	2.32	.00	2000.00	5150.00
13310.000	3350.00	30.08	-.36	2.24	.00	2000.00	5150.00
13310.000	2650.00	29.62	-.46	2.15	.00	2000.00	5150.00
13310.000	1890.00	28.98	-.63	2.09	.00	1857.27	5150.00
13310.000	1380.00	28.40	-.58	2.35	.00	1726.27	5150.00
13310.000	730.00	27.01	-1.39	2.81	.00	886.31	5150.00
13310.000	540.00	26.32	-.69	3.04	.00	556.53	5150.00
15410.000	3970.00	31.07	.00	.64	.00	2200.00	2100.00
15410.000	3350.00	30.71	-.37	.63	.00	2200.00	2100.00
15410.000	2650.00	30.24	-.47	.62	.00	2200.00	2100.00
15410.000	1890.00	29.62	-.62	.64	.00	2200.00	2100.00
15410.000	1380.00	29.09	-.53	.69	.00	1797.57	2100.00
15410.000	730.00	28.08	-1.01	1.07	.00	1411.48	2100.00
15410.000	540.00	27.62	-.46	1.30	.00	525.55	2100.00
16560.000	3970.00	31.48	.00	.41	.00	1450.00	1150.00
16560.000	3350.00	31.11	-.37	.41	.00	1450.00	1150.00
16560.000	2650.00	30.65	-.46	.41	.00	1450.00	1150.00
16560.000	1890.00	30.05	-.60	.43	.00	1450.00	1150.00
16560.000	1380.00	29.55	-.50	.46	.00	1450.00	1150.00
16560.000	730.00	28.66	-.89	.58	.00	1167.31	1150.00
16560.000	540.00	28.21	-.45	.59	.00	650.38	1150.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
19490.000	3970.00	32.02	.00	.54	.00	2200.00	2930.00
19490.000	3350.00	31.68	-.34	.56	.00	2200.00	2930.00
19490.000	2650.00	31.25	-.43	.60	.00	2200.00	2930.00
19490.000	1890.00	30.70	-.55	.65	.00	1676.38	2930.00
19490.000	1380.00	30.24	-.46	.69	.00	1310.31	2930.00
19490.000	730.00	29.46	-.78	.80	.00	1225.90	2930.00
19490.000	540.00	29.09	-.36	.88	.00	1043.44	2930.00
19491.000	3970.00	32.02	.00	.00	.00	2200.00	1.00
19491.000	3350.00	31.68	-.34	.00	.00	2200.00	1.00
19491.000	2650.00	31.25	-.43	.00	.00	2200.00	1.00
19491.000	1890.00	30.71	-.55	.00	.00	1690.36	1.00
19491.000	1380.00	30.24	-.46	.00	.00	1310.30	1.00
19491.000	730.00	29.46	-.78	.01	.00	1225.65	1.00
19491.000	540.00	29.11	-.35	.02	.00	1053.12	1.00
19509.000	3970.00	32.03	.00	.01	.00	2200.00	18.00
19509.000	3350.00	31.69	-.34	.01	.00	2200.00	18.00
19509.000	2650.00	31.27	-.42	.02	.00	2200.00	18.00
19509.000	1890.00	30.72	-.54	.02	.00	1712.98	18.00
19509.000	1380.00	30.26	-.46	.02	.00	1313.85	18.00
19509.000	730.00	29.49	-.77	.03	.00	1228.68	18.00
19509.000	540.00	29.15	-.34	.04	.00	1113.77	18.00
19510.000	3970.00	32.03	.00	-.01	.00	2200.00	1.00
19510.000	3350.00	31.68	-.34	-.01	.00	2200.00	1.00
19510.000	2650.00	31.26	-.43	-.01	.00	2200.00	1.00
19510.000	1890.00	30.71	-.55	-.01	.00	1717.43	1.00
19510.000	1380.00	30.25	-.46	-.01	.00	1314.48	1.00
19510.000	730.00	29.48	-.77	-.01	.00	1228.63	1.00
19510.000	540.00	29.14	-.34	-.01	.00	1117.11	1.00
23230.000	3970.00	32.69	.00	.67	.00	3110.62	3720.00
23230.000	3350.00	32.37	-.32	.69	.00	2654.84	3720.00
23230.000	2650.00	31.98	-.40	.72	.00	2537.91	3720.00
23230.000	1890.00	31.46	-.51	.75	.00	2288.33	3720.00
23230.000	1380.00	31.03	-.43	.78	.00	2160.32	3720.00
23230.000	730.00	30.30	-.73	.82	.00	1846.58	3720.00
23230.000	540.00	29.98	-.32	.84	.00	1580.08	3720.00
24780.000	3970.00	33.00	.00	.31	.00	800.00	1550.00
24780.000	3350.00	32.69	-.31	.31	.00	800.00	1550.00
24780.000	2650.00	32.30	-.39	.32	.00	800.00	1550.00
24780.000	1890.00	31.79	-.51	.33	.00	800.00	1550.00
24780.000	1380.00	31.37	-.42	.34	.00	800.00	1550.00
24780.000	730.00	30.65	-.72	.35	.00	799.34	1550.00
24780.000	540.00	30.34	-.32	.36	.00	713.20	1550.00

SECNO	Q	CWSEL	DIFWSP	DIFWSX	DIFKWS	TOPWID	XLCH
28230.000	3970.00	34.31	.00	1.31	.00	1150.00	3450.00
28230.000	3350.00	33.96	-.36	1.27	.00	1150.00	3450.00
28230.000	2650.00	33.51	-.44	1.21	.00	1150.00	3450.00
28230.000	1890.00	32.94	-.57	1.15	.00	1150.00	3450.00
28230.000	1380.00	32.48	-.46	1.12	.00	1098.37	3450.00
28230.000	730.00	31.71	-.78	1.05	.00	1000.58	3450.00
28230.000	540.00	31.38	-.33	1.04	.00	946.45	3450.00

SUMMARY OF ERRORS AND SPECIAL NOTES

THIS RUN EXECUTED 12/05/88 11:59:04

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*********************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
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APPENDIX 5

HEC-2 COMPUTER MODEL OF GOLEMAN GULLY (EXISTING CONDITIONS)

Run GG2

THIS RUN EXECUTED 01/16/89 18:57:06

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
**********************************************
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FR
T1 HARDIN COUNTY WCID NO. 1 FLOOD STUDY JOB HD-002 DEC 88 JNH
T2 EXISTING CONDITIONS 100-YEAR FLOOD COMPUTER FILE GOLEX
T3 GOLEMAN GULLY START AT NORMAL DEPTH

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	8.	0.	0.	.001000	.00	.0	0.	21.000	.000

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	1.000	.000	-1.000	.000	.000	.000	.000	.000	.000	.000

J3 VARIABLE CODES FOR SUMMARY PRINTOUT

38.000	43.000	13.000	14.000	15.000	40.000	1.000	2.000	3.000	10.000
11.000	12.000	5.000	38.000	39.000	42.000	4.000	53.000	54.000	27.000
28.000	25.000	26.000	16.000	17.000	18.000	.000	.000	.000	.000

J5 LPRNT NUMSEC ********REQUESTED SECTION NUMBERS********

-10.000	-10.000	.000	.000	.000	.000	.000	.000	.000	.000

NC	.060	.060	.050	.100	.300	.000	.000	.000	.000	.000
QT	7.000	140.000	190.000	340.000	460.000	640.000	780.000	900.000	.000	.000
X1	200.000	25.000	2334.000	2345.000	.000	.000	.000	.000	.000	.000
GR	31.100	1950.000	29.900	2000.000	29.500	2100.000	27.800	2200.000	24.500	2300.000
GR	23.900	2317.000	20.600	2334.000	17.100	2338.000	16.700	2341.000	23.300	2345.000
GR	24.800	2355.000	24.900	2400.000	28.700	2480.000	28.600	2500.000	29.000	2525.000
GR	30.800	2560.000	29.100	2585.000	28.900	2600.000	29.700	2655.000	31.300	2700.000
GR	31.600	2720.000	29.200	2755.000	28.500	2800.000	29.000	2900.000	29.300	3000.000

X1	1650.000	23.000	2234.000	2256.000	1350.000	1450.000	1450.000	.000	.000	.000
GR	32.200	1000.000	32.400	1100.000	32.000	1200.000	31.800	1300.000	31.500	1400.000
GR	31.900	1500.000	31.700	1600.000	31.200	1700.000	31.200	1800.000	30.400	1900.000
GR	29.900	2000.000	27.200	2100.000	26.400	2200.000	23.400	2234.000	17.300	2238.000
GR	17.600	2249.000	19.900	2256.000	19.600	2264.000	24.200	2276.000	24.800	2300.000
GR	25.300	2400.000	25.900	2500.000	26.100	2600.000	.000	.000	.000	.000
X1	3300.000	21.000	2053.000	2077.000	1700.000	1650.000	1650.000	.000	.000	.000
GR	31.300	1000.000	31.200	1100.000	31.400	1200.000	31.300	1300.000	30.800	1400.000
GR	30.900	1500.000	30.500	1600.000	29.700	1700.000	28.100	1800.000	26.900	1900.000
GR	26.200	2000.000	25.100	2053.000	19.900	2063.000	19.800	2071.000	25.700	2077.000
GR	26.100	2100.000	29.600	2200.000	30.100	2300.000	30.400	2400.000	30.600	2500.000
GR	31.000	2600.000	.000	.000	.000	.000	.000	.000	.000	.000
QT	7.000	100.000	130.000	240.000	320.000	440.000	550.000	630.000	.000	.000
X1	5460.000	25.000	2028.000	2068.000	3150.000	2900.000	2160.000	.000	.000	.000
GR	33.500	1000.000	33.200	1100.000	33.500	1200.000	33.000	1300.000	33.200	1400.000
GR	33.600	1500.000	31.600	1600.000	31.000	1700.000	30.200	1800.000	29.200	1900.000
GR	28.200	2000.000	28.000	2028.000	27.200	2032.000	25.300	2056.000	28.400	2068.000
GR	28.000	2100.000	30.000	2200.000	32.000	2300.000	32.000	2400.000	33.100	2500.000
GR	33.000	2600.000	33.300	2700.000	32.500	2800.000	33.000	2900.000	32.500	3000.000
NC	.060	.060	.050	.300	.500	.000	.000	.000	.000	.000
X1	5660.000	33.000	2040.000	2069.000	200.000	200.000	200.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	30.500	30.500	.000
GR	33.500	1000.000	33.200	1100.000	33.500	1200.000	33.000	1300.000	33.200	1400.000
GR	33.600	1500.000	31.600	1600.000	31.000	1700.000	30.200	1800.000	29.200	1900.000
GR	28.200	2000.000	28.000	2028.000	27.200	2032.000	25.300	2040.000	25.300	2045.000
GR	25.300	2046.000	25.300	2051.000	25.300	2052.000	25.300	2057.000	25.300	2058.000
GR	25.300	2063.000	25.300	2064.000	25.300	2069.000	28.000	2100.000	30.000	2200.000
GR	32.000	2300.000	32.000	2400.000	33.100	2500.000	33.000	2600.000	33.300	2700.000
GR	32.500	2800.000	33.000	2900.000	32.500	3000.000	.000	.000	.000	.000
NC	.015	.015	.015	.300	.500	.000	.000	.000	.000	.000
X1	5661.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
BT	45.000	1000.000	33.500	33.500	1000.000	35.000	33.500	1100.000	35.000	33.200
BT	1200.000	34.800	33.500	1300.000	34.500	33.000	1400.000	34.200	33.200	1500.000
BT	33.800	33.600	1600.000	33.200	31.600	1700.000	32.700	31.000	1800.000	32.000
BT	30.200	1900.000	31.500	29.200	2000.000	31.200	28.200	2028.000	31.200	28.000
BT	2032.000	31.200	27.200	2040.000	31.200	25.300	2040.000	31.200	29.300	2045.000
BT	31.200	29.300	2045.000	31.200	25.300	2046.000	31.200	25.300	2046.000	31.200
BT	29.300	2051.000	31.200	29.300	2051.000	31.200	25.300	2052.000	31.200	25.300
BT	2052.000	31.200	29.300	2057.000	31.200	29.300	2057.000	31.200	25.300	2058.000
BT	31.200	25.300	2058.000	31.200	29.300	2063.000	31.200	29.300	2063.000	31.200
BT	25.300	2064.000	31.200	25.300	2064.000	31.200	29.300	2069.000	31.200	29.300
BT	2069.000	31.200	25.300	2100.000	31.200	28.000	2200.000	31.500	30.000	2300.000
BT	32.100	32.000	2400.000	32.600	32.000	2500.000	33.100	33.100	2600.000	33.300
BT	33.000	2700.000	33.300	33.300	2800.000	33.300	32.500	2900.000	33.300	33.000
BT	3000.000	33.300	32.500	3000.000	33.300	33.300	.000	.000	.000	.000

X1	5741.000	.000	.000	.000	80.000	80.000	80.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000
NC	.060	.060	.050	.300	.500	.000	.000	.000	.000	.000
X1	5742.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	31.200	31.200	.000
NC	.060	.060	.050	.100	.300	.000	.000	.000	.000	.000
X1	5842.000	25.000	2028.000	2068.000	100.000	100.000	100.000	.000	.000	.000
GR	33.500	1000.000	33.200	1100.000	33.500	1200.000	33.000	1300.000	33.200	1400.000
GR	33.600	1500.000	31.600	1600.000	31.000	1700.000	30.200	1800.000	29.200	1900.000
GR	28.200	2000.000	28.000	2028.000	27.200	2032.000	25.300	2056.000	28.400	2068.000
GR	28.000	2100.000	30.000	2200.000	32.000	2300.000	32.000	2400.000	33.100	2500.000
GR	33.000	2600.000	33.300	2700.000	32.500	2800.000	33.000	2900.000	32.500	3000.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

THIS RUN EXECUTED 01/16/89 18:58:38

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 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
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T1 HARDIN COUNTY WCID NO. 1 FLOOD STUDY              JOB HD-002   DEC 88   JNH
T2 EXISTING CONDITIONS 50-YEAR FLOOD                 COMPUTER FILE GOLEX
T3 GOLEMAN GULLY       START AT NORMAL DEPTH

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0.       7.       0.       0.  .001000      .00       .0       0.   21.000     .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     2.000     .000   -1.000     .000     .000     .000     .000     .000     .000     .000
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THIS RUN EXECUTED 01/13/89 17:23:15

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
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APPENDIX 7

EXPECTED FLOOD DAMAGE - COON MARSH GULLY AND LITTLE PINE ISLAND BAYOU

HARDIN COUNTY MCID NO. 1
COMPUTATION OF EXPECTED FLOOD DAMAGE
COON MARSH GULLY 100-YEAR FLOOD
Job No. HD-002 July 17, 1989 File CMG100.wk1 JNH

					Existing Conditions 100-Year Flood								Proposed Conditions 100-Year Flood (Coon Marsh Gully Improvements)						
			Appraised		Slab	Flood	Depth of	Depth-Damage Factor		Flood Damage			Flood	Depth of	Depth-Damage Factor		Flood Damage		
Block	Lot	Street Address	Value of Structure	Owner	Elevation (feet)	Elevation (feet msl)	Flooding (feet)	Structure	Contents	Structure	Contents	Total	Elevation (feet msl)	Flooding (feet)	Structure	Contents	Structure	Contents	Total
Pinewood Estates																			
1					30.60	31.7	1.10	0.210	0.420	$20,796	$20,796	$41,593	30.2	0.00	0.000	0.000	$0	$0	$0
1					30.78	31.7	0.92	0.199	0.386	$8,298	$8,048	$16,346	30.2	0.00	0.000	0.000	$0	$0	$0
1					30.82	31.7	0.88	0.188	0.352	$11,741	$10,991	$22,732	30.2	0.00	0.000	0.000	$0	$0	$0
1					31.92	31.6	0.00	0.000	0.000	$0	$0	$0	30.2	0.00	0.000	0.000	$0	$0	$0
1					30.87	31.5	0.63	0.166	0.284	$8,733	$7,471	$16,204	30.2	0.00	0.000	0.000	$0	$0	$0
1					32.55	31.4	0.00	0.000	0.000	$0	$0	$0	30.1	0.00	0.000	0.000	$0	$0	$0
1					31.99	31.3	0.00	0.000	0.000	$0	$0	$0	30.0	0.00	0.000	0.000	$0	$0	$0
1					31.90	31.2	0.00	0.000	0.000	$0	$0	$0	29.9	0.00	0.000	0.000	$0	$0	$0
1					31.90	31.1	0.00	0.000	0.000	$0	$0	$0	29.8	0.00	0.000	0.000	$0	$0	$0
1					31.56	31.0	0.00	0.000	0.000	$0	$0	$0	29.7	0.00	0.000	0.000	$0	$0	$0
1					31.62	30.8	0.00	0.000	0.000	$0	$0	$0	29.4	0.00	0.000	0.000	$0	$0	$0
1					31.11	30.7	0.00	0.000	0.000	$0	$0	$0	29.3	0.00	0.000	0.000	$0	$0	$0
1					30.79	30.6	0.00	0.000	0.000	$0	$0	$0	29.2	0.00	0.000	0.000	$0	$0	$0
1					31.20	30.5	0.00	0.000	0.000	$0	$0	$0	29.1	0.00	0.000	0.000	$0	$0	$0
9					32.04	31.7	0.00	0.000	0.000	$0	$0	$0	30.2	0.00	0.000	0.000	$0	$0	$0
9					32.19	31.7	0.00	0.000	0.000	$0	$0	$0	30.2	0.00	0.000	0.000	$0	$0	$0
9					31.39	31.7	0.31	0.133	0.182	$7,384	$5,052	$12,436	30.2	0.00	0.000	0.000	$0	$0	$0
9					32.12	31.7	0.00	0.000	0.000	$0	$0	$0	30.2	0.00	0.000	0.000	$0	$0	$0
9					31.15	31.7	0.55	0.155	0.250	$11,382	$9,179	$20,560	30.2	0.00	0.000	0.000	$0	$0	$0
Total	19 residences		$1,208,930							$68,334	$61,537	$129,872					$0	$0	$0
Country Wood Estates																			
1					33.07	31.0	0.00	0.000	0.000	$0	$0	$0	29.7	0.00	0.000	0.000	$0	$0	$0
1					32.59	32.3	0.00	0.000	0.000	$0	$0	$0	30.7	0.00	0.000	0.000	$0	$0	$0
5					32.67	33.0	0.33	0.133	0.182	$6,682	$4,572	$11,254	31.7	0.00	0.000	0.000	$0	$0	$0
5					32.35	33.0	0.65	0.166	0.284	$5,878	$5,028	$10,906	31.7	0.00	0.000	0.000	$0	$0	$0
6					32.23	32.5	0.27	0.122	0.148	$6,806	$4,128	$10,935	30.9	0.00	0.000	0.000	$0	$0	$0
6					32.42	32.6	0.18	0.111	0.114	$8,165	$4,193	$12,358	31.0	0.00	0.000	0.000	$0	$0	$0
6					31.55	32.6	1.05	0.210	0.420	$15,441	$15,441	$30,883	31.0	0.00	0.000	0.000	$0	$0	$0
6					32.46	32.7	0.24	0.122	0.148	$9,113	$5,528	$14,641	31.1	0.00	0.000	0.000	$0	$0	$0
7					29.52	31.9	2.38	0.285	0.633	$18,591	$20,645	$39,236	30.5	0.98	0.199	0.386	$12,981	$12,589	$25,570
7					31.00	31.9	0.90	0.188	0.352	$6,917	$6,475	$13,392	30.5	0.00	0.000	0.000	$0	$0	$0
7					32.31	32.1	0.00	0.000	0.000	$0	$0	$0	30.6	0.00	0.000	0.000	$0	$0	$0
7					30.52	32.1	1.58	0.240	0.510	$12,456	$13,235	$25,691	30.6	0.08	0.100	0.080	$5,190	$2,076	$7,266
Total	12 residences		$725,760							$90,049	$79,245	$169,295					$18,171	$14,665	$32,836
Grand Total	31 residences		$1,934,690							$158,384	$140,783	$299,166					$18,171	$14,665	$32,836

Notes
1. Appraised values of structures (excluding land) per Hardin County Appraisal District.
2. Depth-damage factors per Galveston District, Corps of Engineers for Class 1 structures.
3. Value of structure contents estimated at 50% of structure value.

HARDIN COUNTY WCID NO. 1
COMPUTATION OF EXPECTED FLOOD DAMAGE
COON MARSH GULLY 50-YEAR FLOOD
Job No. HD-002 July 17, 1989 File CMG50.wk1 JMH

					Existing Conditions 50-Year Flood								Proposed Conditions 50-Year Flood (Coon Marsh Gully Improvements)						
								Depth-Damage Factor		Flood Damage					Depth-Damage Factor		Flood Damage		
Block	Lot	Street Address	Appraised Value of Structure	Owner	Slab Elevation (feet)	Flood Elevation (feet msl)	Depth of Flooding (feet)	Structure	Contents	Structure	Contents	Total	Flood Elevation (feet msl)	Depth of Flooding (feet)	Structure	Contents	Structure	Contents	Total
Pinewood Estates																			
1					30.60	31.6	1.00	0.210	0.420	$20,796	$20,796	$41,593	29.6	0.00	0.000	0.000	$0	$0	$0
1					30.78	31.6	0.82	0.188	0.352	$7,840	$7,339	$15,179	29.6	0.00	0.000	0.000	$0	$0	$0
1					30.82	31.6	0.78	0.177	0.318	$11,054	$9,930	$20,983	29.6	0.00	0.000	0.000	$0	$0	$0
1					31.92	31.6	0.00	0.000	0.000	$0	$0	$0	29.6	0.00	0.000	0.000	$0	$0	$0
1					30.87	31.5	0.63	0.166	0.284	$8,733	$7,471	$16,204	29.5	0.00	0.000	0.000	$0	$0	$0
1					32.55	31.4	0.00	0.000	0.000	$0	$0	$0	29.4	0.00	0.000	0.000	$0	$0	$0
1					31.99	31.3	0.00	0.000	0.000	$0	$0	$0	29.3	0.00	0.000	0.000	$0	$0	$0
1					31.90	31.2	0.00	0.000	0.000	$0	$0	$0	29.2	0.00	0.000	0.000	$0	$0	$0
1					31.90	31.1	0.00	0.000	0.000	$0	$0	$0	29.1	0.00	0.000	0.000	$0	$0	$0
1					31.56	31.0	0.00	0.000	0.000	$0	$0	$0	29.0	0.00	0.000	0.000	$0	$0	$0
1					31.62	30.7	0.00	0.000	0.000	$0	$0	$0	28.7	0.00	0.000	0.000	$0	$0	$0
1					31.11	30.6	0.00	0.000	0.000	$0	$0	$0	28.6	0.00	0.000	0.000	$0	$0	$0
1					30.79	30.5	0.00	0.000	0.000	$0	$0	$0	28.5	0.00	0.000	0.000	$0	$0	$0
1					31.20	30.4	0.00	0.000	0.000	$0	$0	$0	28.4	0.00	0.000	0.000	$0	$0	$0
9					32.04	31.6	0.00	0.000	0.000	$0	$0	$0	29.6	0.00	0.000	0.000	$0	$0	$0
9					32.19	31.6	0.00	0.000	0.000	$0	$0	$0	29.6	0.00	0.000	0.000	$0	$0	$0
9					31.39	31.6	0.21	0.122	0.148	$6,773	$4,108	$10,882	29.6	0.00	0.000	0.000	$0	$0	$0
9					32.12	31.6	0.00	0.000	0.000	$0	$0	$0	29.6	0.00	0.000	0.000	$0	$0	$0
9					31.15	31.6	0.45	0.144	0.216	$10,574	$7,930	$18,504	29.6	0.00	0.000	0.000	$0	$0	$0
Total	19 residences		$1,208,930							$65,770	$57,575	$123,345					$0	$0	$0
Country Wood Estates																			
1					33.07	31.0	0.00	0.000	0.000	$0	$0	$0	29.0	0.00	0.000	0.000	$0	$0	$0
1					32.59	32.2	0.00	0.000	0.000	$0	$0	$0	30.7	0.00	0.000	0.000	$0	$0	$0
5					32.67	32.8	0.13	0.111	0.114	$5,577	$2,864	$8,440	31.2	0.00	0.000	0.000	$0	$0	$0
5					32.35	32.8	0.45	0.144	0.216	$5,099	$3,824	$8,923	31.2	0.00	0.000	0.000	$0	$0	$0
6					32.23	32.3	0.07	0.100	0.080	$5,579	$2,232	$7,811	30.4	0.00	0.000	0.000	$0	$0	$0
6					32.42	32.4	0.00	0.000	0.000	$0	$0	$0	30.5	0.00	0.000	0.000	$0	$0	$0
6					31.55	32.4	0.85	0.188	0.352	$13,824	$12,941	$26,765	30.5	0.00	0.000	0.000	$0	$0	$0
6					32.46	32.5	0.04	0.100	0.080	$7,470	$2,988	$10,458	30.6	0.00	0.000	0.000	$0	$0	$0
7					29.52	31.8	2.28	0.280	0.622	$18,264	$20,287	$38,551	29.8	0.28	0.122	0.148	$7,958	$4,827	$12,785
7					31.00	31.8	0.80	0.188	0.352	$6,917	$6,475	$13,392	29.8	0.00	0.000	0.000	$0	$0	$0
7					32.31	32.1	0.00	0.000	0.000	$0	$0	$0	30.1	0.00	0.000	0.000	$0	$0	$0
7					30.52	32.1	1.58	0.240	0.510	$12,456	$13,235	$25,691	30.1	0.00	0.000	0.000	$0	$0	$0
Total	12 residences		$725,760							$75,185	$64,845	$140,030					$7,958	$4,827	$12,785
Grand Total	31 residences		$1,934,690							$140,955	$122,420	$263,375					$7,958	$4,827	$12,785

Notes
1. Appraised values of structures (excluding land) per Hardin County Appraisal District.
2. Depth-damage factors per Galveston District, Corps of Engineers for Class I structures.
3. Value of structure contents estimated at 50% of structure value.

HARDIN COUNTY MCID NO. 1
COMPUTATION OF EXPECTED FLOOD DAMAGE
COON MARSH GULLY 25-YEAR FLOOD
Job No. HD-002 July 17, 1989 File CMG25.wk1 JNH

Block	Lot	Street Address	Appraised Value of Structure	Owner	Slab Elevation (feet)	Existing Conditions 25-Year Flood: Flood Elevation (feet msl)	Depth of Flooding (feet)	Depth-Damage Factor: Structure	Depth-Damage Factor: Contents	Flood Damage: Structure	Flood Damage: Contents	Flood Damage: Total	Proposed Conditions 25-Year Flood (Coon Marsh Gully Improvements): Flood Elevation (feet msl)	Depth of Flooding (feet)	Depth-Damage Factor: Structure	Depth-Damage Factor: Contents	Flood Damage: Structure	Flood Damage: Contents	Flood Damage: Total
Pinewood Estates																			
1					30.60	31.6	1.00	0.210	0.420	$20,796	$20,796	$41,593	28.9	0.00	0.000	0.000	$0	$0	$0
1					30.78	31.6	0.82	0.188	0.352	$7,840	$7,339	$15,179	28.9	0.00	0.000	0.000	$0	$0	$0
1					30.82	31.6	0.78	0.177	0.318	$11,054	$9,930	$20,983	28.9	0.00	0.000	0.000	$0	$0	$0
1					31.92	31.6	0.00	0.000	0.000	$0	$0	$0	28.9	0.00	0.000	0.000	$0	$0	$0
1					30.87	31.5	0.63	0.166	0.284	$8,733	$7,471	$16,204	28.8	0.00	0.000	0.000	$0	$0	$0
1					32.55	31.4	0.00	0.000	0.000	$0	$0	$0	28.7	0.00	0.000	0.000	$0	$0	$0
1					31.99	31.3	0.00	0.000	0.000	$0	$0	$0	28.6	0.00	0.000	0.000	$0	$0	$0
1					31.90	31.2	0.00	0.000	0.000	$0	$0	$0	28.5	0.00	0.000	0.000	$0	$0	$0
1					31.90	31.1	0.00	0.000	0.000	$0	$0	$0	28.4	0.00	0.000	0.000	$0	$0	$0
1					31.56	31.0	0.00	0.000	0.000	$0	$0	$0	28.3	0.00	0.000	0.000	$0	$0	$0
1					31.62	30.7	0.00	0.000	0.000	$0	$0	$0	27.8	0.00	0.000	0.000	$0	$0	$0
1					31.11	30.6	0.00	0.000	0.000	$0	$0	$0	27.7	0.00	0.000	0.000	$0	$0	$0
1					30.79	30.5	0.00	0.000	0.000	$0	$0	$0	27.6	0.00	0.000	0.000	$0	$0	$0
1					31.20	30.4	0.00	0.000	0.000	$0	$0	$0	27.5	0.00	0.000	0.000	$0	$0	$0
9					32.04	31.6	0.00	0.000	0.000	$0	$0	$0	28.9	0.00	0.000	0.000	$0	$0	$0
9					32.19	31.6	0.00	0.000	0.000	$0	$0	$0	28.9	0.00	0.000	0.000	$0	$0	$0
9					31.39	31.6	0.21	0.122	0.148	$6,773	$4,108	$10,882	28.9	0.00	0.000	0.000	$0	$0	$0
9					32.12	31.6	0.00	0.000	0.000	$0	$0	$0	28.9	0.00	0.000	0.000	$0	$0	$0
9					31.15	31.6	0.45	0.144	0.216	$10,574	$7,930	$18,504	28.9	0.00	0.000	0.000	$0	$0	$0
Total	19 residences		$1,208,930							$65,770	$57,575	$123,345					$0	$0	$0
Country Wood Estates																			
1					33.07	31.0	0.00	0.000	0.000	$0	$0	$0	28.3	0.00	0.000	0.000	$0	$0	$0
1					32.59	32.0	0.00	0.000	0.000	$0	$0	$0	29.6	0.00	0.000	0.000	$0	$0	$0
5					32.67	32.6	0.00	0.000	0.000	$0	$0	$0	30.5	0.00	0.000	0.000	$0	$0	$0
5					32.35	32.6	0.25	0.122	0.148	$4,320	$2,620	$6,940	30.5	0.00	0.000	0.000	$0	$0	$0
6					32.23	32.2	0.00	0.000	0.000	$0	$0	$0	29.8	0.00	0.000	0.000	$0	$0	$0
6					32.42	32.3	0.00	0.000	0.000	$0	$0	$0	29.9	0.00	0.000	0.000	$0	$0	$0
6					31.55	32.3	0.75	0.177	0.318	$13,015	$11,691	$24,706	29.9	0.00	0.000	0.000	$0	$0	$0
6					32.46	32.4	0.00	0.000	0.000	$0	$0	$0	30.0	0.00	0.000	0.000	$0	$0	$0
7					29.52	31.8	2.28	0.280	0.622	$18,264	$20,287	$38,551	29.2	0.00	0.000	0.000	$0	$0	$0
7					31.00	31.8	0.80	0.188	0.352	$6,917	$6,475	$13,392	29.2	0.00	0.000	0.000	$0	$0	$0
7					32.31	31.9	0.00	0.000	0.000	$0	$0	$0	29.5	0.00	0.000	0.000	$0	$0	$0
7					30.52	31.9	1.38	0.228	0.474	$11,833	$12,300	$24,134	29.5	0.00	0.000	0.000	$0	$0	$0
Total	12 residences		$725,760							$54,349	$53,373	$107,722					$0	$0	$0
Grand Total	31 residences		$1,934,690							$120,119	$110,948	$231,067					$0	$0	$0

Notes
1. Appraised values of structures (excluding land) per Hardin County Appraisal District.
2. Depth-damage factors per Galveston District, Corps of Engineers for Class 1 structures.
3. Value of structure contents estimated at 50% of structure value.

HARDIN COUNTY MCID NO. 1
COMPUTATION OF EXPECTED FLOOD DAMAGE
COON MARSH GULLY 10-YEAR FLOOD
Job No. HD-002 July 17, 1989 File CMG10.wk1 JMH

					Existing Conditions 10-Year Flood								Proposed Conditions 10-Year Flood (Coon Marsh Gully Improvements)						
			Appraised Value of		Slab Elevation	Flood Elevation	Depth of Flooding	Depth-Damage Factor		Flood Damage			Flood Elevation	Depth of Flooding	Depth-Damage Factor		Flood Damage		
Block	Lot	Street Address	Structure	Owner	(feet)	(feet msl)	(feet)	Structure	Contents	Structure	Contents	Total	(feet msl)	(feet)	Structure	Contents	Structure	Contents	Total
Pinewood Estates																			
	1				30.60	31.4	0.80	0.177	0.318	$17,528	$15,746	$33,274	27.8	0.00	0.000	0.000	$0	$0	$0
	1				30.78	31.4	0.62	0.166	0.284	$6,922	$5,921	$12,844	27.8	0.00	0.000	0.000	$0	$0	$0
	1				30.82	31.4	0.58	0.155	0.250	$9,680	$7,806	$17,486	27.8	0.00	0.000	0.000	$0	$0	$0
	1				31.92	31.4	0.00	0.000	0.000	$0	$0	$0	27.7	0.00	0.000	0.000	$0	$0	$0
	1				30.87	31.4	0.53	0.155	0.250	$8,155	$6,576	$14,731	27.6	0.00	0.000	0.000	$0	$0	$0
	1				32.55	31.4	0.00	0.000	0.000	$0	$0	$0	27.5	0.00	0.000	0.000	$0	$0	$0
	1				31.99	31.3	0.00	0.000	0.000	$0	$0	$0	27.4	0.00	0.000	0.000	$0	$0	$0
	1				31.90	31.2	0.00	0.000	0.000	$0	$0	$0	27.3	0.00	0.000	0.000	$0	$0	$0
	1				31.90	31.1	0.00	0.000	0.000	$0	$0	$0	27.2	0.00	0.000	0.000	$0	$0	$0
	1				31.56	31.0	0.00	0.000	0.000	$0	$0	$0	27.1	0.00	0.000	0.000	$0	$0	$0
	1				31.62	30.5	0.00	0.000	0.000	$0	$0	$0	26.7	0.00	0.000	0.000	$0	$0	$0
	1				31.11	30.4	0.00	0.000	0.000	$0	$0	$0	26.6	0.00	0.000	0.000	$0	$0	$0
	1				30.79	30.3	0.00	0.000	0.000	$0	$0	$0	26.5	0.00	0.000	0.000	$0	$0	$0
	1				31.20	30.2	0.00	0.000	0.000	$0	$0	$0	26.4	0.00	0.000	0.000	$0	$0	$0
	9				32.04	31.4	0.00	0.000	0.000	$0	$0	$0	27.8	0.00	0.000	0.000	$0	$0	$0
	9				32.19	31.4	0.00	0.000	0.000	$0	$0	$0	27.8	0.00	0.000	0.000	$0	$0	$0
	9				31.39	31.4	0.01	0.100	0.080	$5,552	$2,221	$7,773	27.8	0.00	0.000	0.000	$0	$0	$0
	9				32.12	31.4	0.00	0.000	0.000	$0	$0	$0	27.8	0.00	0.000	0.000	$0	$0	$0
	9				31.15	31.4	0.25	0.122	0.148	$8,958	$5,434	$14,392	27.8	0.00	0.000	0.000	$0	$0	$0
Total	19 residences		$1,208,930							$56,795	$43,704	$100,500					$0	$0	$0
Country Wood Estates																			
	1				33.07	31.0	0.00	0.000	0.000	$0	$0	$0	27.1	0.00	0.000	0.000	$0	$0	$0
	1				32.59	31.7	0.00	0.000	0.000	$0	$0	$0	28.5	0.00	0.000	0.000	$0	$0	$0
	5				32.67	32.3	0.00	0.000	0.000	$0	$0	$0	29.3	0.00	0.000	0.000	$0	$0	$0
	5				32.35	32.3	0.00	0.000	0.000	$0	$0	$0	29.3	0.00	0.000	0.000	$0	$0	$0
	6				32.23	31.9	0.00	0.000	0.000	$0	$0	$0	28.7	0.00	0.000	0.000	$0	$0	$0
	6				32.42	32.0	0.00	0.000	0.000	$0	$0	$0	28.8	0.00	0.000	0.000	$0	$0	$0
	6				31.55	32.0	0.45	0.144	0.216	$10,588	$7,941	$18,530	28.8	0.00	0.000	0.000	$0	$0	$0
	6				32.46	32.0	0.00	0.000	0.000	$0	$0	$0	28.9	0.00	0.000	0.000	$0	$0	$0
	7				29.52	31.5	1.98	0.264	0.582	$17,221	$18,982	$36,203	28.1	0.00	0.000	0.000	$0	$0	$0
	7				31.00	31.5	0.50	0.144	0.216	$5,298	$3,973	$9,271	28.1	0.00	0.000	0.000	$0	$0	$0
	7				32.31	31.7	0.00	0.000	0.000	$0	$0	$0	28.4	0.00	0.000	0.000	$0	$0	$0
	7				30.52	31.7	1.18	0.216	0.438	$11,210	$11,366	$22,577	28.4	0.00	0.000	0.000	$0	$0	$0
Total	12 residences		$725,760							$44,317	$42,263	$86,580					$0	$0	$0
Grand Total	31 residences		$1,934,690							$101,112	$85,967	$187,079					$0	$0	$0

Notes
1. Appraised values of structures (excluding land) per Hardin County Appraisal District.
2. Depth-damage factors per Galveston District, Corps of Engineers for Class 1 structures.
3. Value of structure contents estimated at 50% of structure value.

HARDIN COUNTY MCID NO. 1
COMPUTATION OF EXPECTED FLOOD DAMAGE
COON MARSH GULLY 5-YEAR FLOOD
Job No. HD-002 July 17, 1989 File CMGS.wk1 JNH

					Existing Conditions 5-Year Flood								Proposed Conditions 5-Year Flood (Coon Marsh Gully Improvements)						
			Appraised Value of		Slab Elevation	Flood Elevation	Depth of Flooding	Depth-Damage Factor		Flood Damage			Flood Elevation	Depth of Flooding	Depth-Damage Factor		Flood Damage		
Block	Lot	Street Address	Structure	Owner	(feet)	(feet msl)	(feet)	Structure	Contents	Structure	Contents	Total	(feet msl)	(feet)	Structure	Contents	Structure	Contents	Total
Pinewood Estates																			
	1				30.60	31.3	0.70	0.166	0.284	$16,439	$14,062	$30,501	27.8	0.00	0.000	0.000	$0	$0	$0
	1				30.78	31.3	0.52	0.155	0.250	$6,464	$5,213	$11,676	27.8	0.00	0.000	0.000	$0	$0	$0
	1				30.82	31.3	0.48	0.144	0.216	$8,993	$6,745	$15,737	27.8	0.00	0.000	0.000	$0	$0	$0
	1				31.92	31.3	0.00	0.000	0.000	$0	$0	$0	27.7	0.00	0.000	0.000	$0	$0	$0
	1				30.87	31.3	0.43	0.144	0.216	$7,576	$5,682	$13,258	27.6	0.00	0.000	0.000	$0	$0	$0
	1				32.55	31.3	0.00	0.000	0.000	$0	$0	$0	27.5	0.00	0.000	0.000	$0	$0	$0
	1				31.99	31.2	0.00	0.000	0.000	$0	$0	$0	27.4	0.00	0.000	0.000	$0	$0	$0
	1				31.90	31.1	0.00	0.000	0.000	$0	$0	$0	27.3	0.00	0.000	0.000	$0	$0	$0
	1				31.90	30.0	0.00	0.000	0.000	$0	$0	$0	27.2	0.00	0.000	0.000	$0	$0	$0
	1				31.56	30.9	0.00	0.000	0.000	$0	$0	$0	27.1	0.00	0.000	0.000	$0	$0	$0
	1				31.62	30.4	0.00	0.000	0.000	$0	$0	$0	26.7	0.00	0.000	0.000	$0	$0	$0
	1				31.11	30.3	0.00	0.000	0.000	$0	$0	$0	26.6	0.00	0.000	0.000	$0	$0	$0
	1				30.79	30.2	0.00	0.000	0.000	$0	$0	$0	26.5	0.00	0.000	0.000	$0	$0	$0
	1				31.20	30.1	0.00	0.000	0.000	$0	$0	$0	26.4	0.00	0.000	0.000	$0	$0	$0
	9				32.04	31.3	0.00	0.000	0.000	$0	$0	$0	27.8	0.00	0.000	0.000	$0	$0	$0
	9				32.19	31.3	0.00	0.000	0.000	$0	$0	$0	27.8	0.00	0.000	0.000	$0	$0	$0
	9				31.39	31.3	0.00	0.000	0.000	$0	$0	$0	27.8	0.00	0.000	0.000	$0	$0	$0
	9				32.12	31.3	0.00	0.000	0.000	$0	$0	$0	27.8	0.00	0.000	0.000	$0	$0	$0
	9				31.15	31.3	0.15	0.111	0.114	$8,151	$4,186	$12,336	27.8	0.00	0.000	0.000	$0	$0	$0
Total	19 residences		$1,208,930							$47,622	$35,887	$83,509					$0	$0	$0
Country Wood Estates																			
	1				33.07	30.9	0.00	0.000	0.000	$0	$0	$0	27.1	0.00	0.000	0.000	$0	$0	$0
	1				32.59	31.5	0.00	0.000	0.000	$0	$0	$0	28.5	0.00	0.000	0.000	$0	$0	$0
	5				32.67	32.0	0.00	0.000	0.000	$0	$0	$0	29.3	0.00	0.000	0.000	$0	$0	$0
	5				32.35	32.0	0.00	0.000	0.000	$0	$0	$0	29.3	0.00	0.000	0.000	$0	$0	$0
	6				32.23	31.6	0.00	0.000	0.000	$0	$0	$0	28.7	0.00	0.000	0.000	$0	$0	$0
	6				32.42	31.7	0.00	0.000	0.000	$0	$0	$0	28.8	0.00	0.000	0.000	$0	$0	$0
	6				31.55	31.7	0.15	0.111	0.114	$8,162	$4,191	$12,353	28.8	0.00	0.000	0.000	$0	$0	$0
	6				32.46	31.8	0.00	0.000	0.000	$0	$0	$0	28.9	0.00	0.000	0.000	$0	$0	$0
	7				29.52	31.4	1.88	0.258	0.564	$16,829	$18,395	$35,224	28.1	0.00	0.000	0.000	$0	$0	$0
	7				31.00	31.4	0.40	0.133	0.182	$4,893	$3,348	$8,241	28.1	0.00	0.000	0.000	$0	$0	$0
	7				32.31	31.5	0.00	0.000	0.000	$0	$0	$0	28.4	0.00	0.000	0.000	$0	$0	$0
	7				30.52	31.5	0.98	0.199	0.386	$10,328	$10,017	$20,345	28.4	0.00	0.000	0.000	$0	$0	$0
Total	12 residences		$725,760							$40,212	$35,951	$76,163					$0	$0	$0
Grand Total	31 residences		$1,934,690							$87,834	$71,837	$159,672					$0	$0	$0

Notes
1. Appraised values of structures (excluding land) per Hardin County Appraisal District.
2. Depth-damage factors per Galveston District, Corps of Engineers for Class I structures.
3. Value of structure contents estimated at 50% of structure value.

HARDIN COUNTY MCID NO. 1
COMPUTATION OF EXPECTED FLOOD DAMAGE
COON MARSH GULLY 2-YEAR FLOOD
Job No. HD-002 July 17, 1989 File CM52.wk1 JNH

						Existing Conditions 2-Year Flood								Proposed Conditions 2-Year Flood (Coon Marsh Gully Improvements)						
Block	Lot	Street Address	Appraised Value of Structure	Owner	Slab Elevation (feet)	Flood Elevation (feet msl)	Depth of Flooding (feet)	Depth-Damage Factor		Flood Damage			Flood Elevation (feet msl)	Depth of Flooding (feet)	Depth-Damage Factor		Flood Damage		
								Structure	Contents	Structure	Contents	Total			Structure	Contents	Structure	Contents	Total
Pinewood Estates																			
1					30.60	30.6	0.00	0.000	0.000	$0	$0	$0	27.8	0.00	0.000	0.000	$0	$0	$0
1					30.78	30.6	0.00	0.000	0.000	$0	$0	$0	27.8	0.00	0.000	0.000	$0	$0	$0
1					30.82	30.6	0.00	0.000	0.000	$0	$0	$0	27.8	0.00	0.000	0.000	$0	$0	$0
1					31.92	30.6	0.00	0.000	0.000	$0	$0	$0	27.7	0.00	0.000	0.000	$0	$0	$0
1					30.87	30.6	0.00	0.000	0.000	$0	$0	$0	27.6	0.00	0.000	0.000	$0	$0	$0
1					32.55	30.6	0.00	0.000	0.000	$0	$0	$0	27.5	0.00	0.000	0.000	$0	$0	$0
1					31.99	30.5	0.00	0.000	0.000	$0	$0	$0	27.4	0.00	0.000	0.000	$0	$0	$0
1					31.98	30.4	0.00	0.000	0.000	$0	$0	$0	27.3	0.00	0.000	0.000	$0	$0	$0
1					31.90	30.3	0.00	0.000	0.000	$0	$0	$0	27.2	0.00	0.000	0.000	$0	$0	$0
1					31.56	30.2	0.00	0.000	0.000	$0	$0	$0	27.1	0.00	0.000	0.000	$0	$0	$0
1					31.62	29.6	0.00	0.000	0.000	$0	$0	$0	26.7	0.00	0.000	0.000	$0	$0	$0
1					31.11	29.5	0.00	0.000	0.000	$0	$0	$0	26.6	0.00	0.000	0.000	$0	$0	$0
1					30.79	29.4	0.00	0.000	0.000	$0	$0	$0	26.5	0.00	0.000	0.000	$0	$0	$0
1					31.20	29.3	0.00	0.000	0.000	$0	$0	$0	26.4	0.00	0.000	0.000	$0	$0	$0
9					32.04	30.6	0.00	0.000	0.000	$0	$0	$0	27.8	0.00	0.000	0.000	$0	$0	$0
9					32.19	30.6	0.00	0.000	0.000	$0	$0	$0	27.8	0.00	0.000	0.000	$0	$0	$0
9					31.39	30.6	0.00	0.000	0.000	$0	$0	$0	27.8	0.00	0.000	0.000	$0	$0	$0
9					32.12	30.6	0.00	0.000	0.000	$0	$0	$0	27.8	0.00	0.000	0.000	$0	$0	$0
9					31.15	30.6	0.00	0.000	0.000	$0	$0	$0	27.8	0.00	0.000	0.000	$0	$0	$0
Total	19 residences		$1,208,930							$0	$0	$0					$0	$0	$0
Country Wood Estates																			
1					33.07	30.2	0.00	0.000	0.000	$0	$0	$0	27.1	0.00	0.000	0.000	$0	$0	$0
1					32.59	30.8	0.00	0.000	0.000	$0	$0	$0	28.5	0.00	0.000	0.000	$0	$0	$0
5					32.67	31.4	0.00	0.000	0.000	$0	$0	$0	29.3	0.00	0.000	0.000	$0	$0	$0
5					32.35	31.4	0.00	0.000	0.000	$0	$0	$0	29.3	0.00	0.000	0.000	$0	$0	$0
6					32.23	30.9	0.00	0.000	0.000	$0	$0	$0	28.7	0.00	0.000	0.000	$0	$0	$0
6					32.42	31.0	0.00	0.000	0.000	$0	$0	$0	28.8	0.00	0.000	0.000	$0	$0	$0
6					31.55	31.0	0.00	0.000	0.000	$0	$0	$0	28.8	0.00	0.000	0.000	$0	$0	$0
6					32.46	31.1	0.00	0.000	0.000	$0	$0	$0	28.9	0.00	0.000	0.000	$0	$0	$0
7					29.52	30.7	1.18	0.216	0.438	$14,090	$14,285	$28,375	28.1	0.00	0.000	0.000	$0	$0	$0
7					31.00	30.7	0.00	0.000	0.000	$0	$0	$0	28.1	0.00	0.000	0.000	$0	$0	$0
7					32.31	30.8	0.00	0.000	0.000	$0	$0	$0	28.4	0.00	0.000	0.000	$0	$0	$0
7					30.52	30.8	0.28	0.122	0.148	$6,332	$3,841	$10,172	28.4	0.00	0.000	0.000	$0	$0	$0
Total	12 residences		$725,760							$20,421	$18,126	$38,547					$0	$0	$0
Grand Total	31 residences		$1,934,690							$20,421	$18,126	$38,547					$0	$0	$0

Notes
1. Appraised values of structures (excluding land) per Hardin County Appraisal District.
2. Depth-damage factors per Galveston District, Corps of Engineers for Class 1 structures.
3. Value of structure contents estimated at 50% of structure value.

HARDIN COUNTY MCID
COMPUTATION OF EXPECTED FL... DAMAGE
LITTLE PINE ISLAND BAYOU 100-YEAR FLOOD
Job No. HD-002 July 12, 1989 File LPIB100.wk1 JNH

					Existing Conditions 100-Year Flood								Proposed Conditions 100-Year Flood (Coon Marsh Gully Improvements and Levee Improvements Along Clemmons Gully)						
			Appraised		Slab	Flood	Depth of	Depth-Damage Factor		Flood Damage			Flood	Depth of	Depth-Damage Factor		Flood Damage		
Block	Lot	Street Address	Value of Structure	Owner	Elevation (feet msl)	Elevation (feet msl)	Flooding (feet)	Structure	Contents	Structure	Contents	Total	Elevation (feet msl)	Flooding (feet)	Structure	Contents	Structure	Contents	Total
3					?	29.3	?	0.000	0.000	$0	$0	$0	29.3	?	0.000	0.000	$0	$0	$0
4					29.23	29.3	0.07	0.100	0.080	$5,812	$2,325	$8,137	29.3	0.07	0.100	0.080	$5,812	$2,325	$8,137
4					28.55	29.3	0.75	0.177	0.318	$14,422	$12,955	$27,377	29.3	0.75	0.177	0.318	$14,422	$12,955	$27,377
5					29.14	29.3	0.16	0.111	0.114	$9,694	$4,978	$14,671	26.0	0.00	0.000	0.000	$0	$0	$0
5					29.96	29.3	0.00	0.000	0.000	$0	$0	$0	26.0	0.00	0.000	0.000	$0	$0	$0
5					?	29.3	?	0.000	0.000	$0	$0	$0	26.0	?	0.000	0.000	$0	$0	$0
5					30.70	29.3	0.00	0.000	0.000	$0	$0	$0	26.0	0.00	0.000	0.000	$0	$0	$0
5					29.47	29.3	0.00	0.000	0.000	$0	$0	$0	26.0	0.00	0.000	0.000	$0	$0	$0
5					28.32	29.3	0.98	0.199	0.386	$8,348	$8,096	$16,444	26.0	0.00	0.000	0.000	$0	$0	$0
5					27.21	29.3	2.09	0.270	0.600	$26,987	$29,985	$56,972	26.0	0.00	0.000	0.000	$0	$0	$0
5					27.12	29.3	2.18	0.275	0.611	$21,948	$24,392	$46,330	26.0	0.00	0.000	0.000	$0	$0	$0
5					28.78	29.3	0.52	0.155	0.250	$22,470	$18,121	$40,592	26.0	0.00	0.000	0.000	$0	$0	$0
5					28.00	29.3	1.30	0.228	0.474	$18,062	$18,775	$36,837	26.0	0.00	0.000	0.000	$0	$0	$0
5					28.81	29.3	0.49	0.144	0.216	$7,057	$5,293	$12,351	26.0	0.00	0.000	0.000	$0	$0	$0
5					29.31	29.3	0.00	0.000	0.000	$0	$0	$0	26.0	0.00	0.000	0.000	$0	$0	$0
5					26.76	29.3	2.54	0.295	0.655	$28,518	$31,659	$60,177	26.0	0.00	0.000	0.000	$0	$0	$0
5					26.96	29.3	2.34	0.285	0.633	$19,947	$22,152	$42,099	26.0	0.00	0.000	0.000	$0	$0	$0
5					26.13	29.3	3.17	0.325	0.716	$24,385	$26,861	$51,245	26.0	0.00	0.000	0.000	$0	$0	$0
5					26.22	29.3	3.08	0.320	0.710	$21,984	$24,389	$46,373	26.0	0.00	0.000	0.000	$0	$0	$0
5					27.74	29.3	1.56	0.240	0.510	$11,333	$12,041	$23,374	26.0	0.00	0.000	0.000	$0	$0	$0
5					26.78	29.3	2.52	0.295	0.655	$26,730	$29,675	$56,405	26.0	0.00	0.000	0.000	$0	$0	$0
5					26.77	29.3	2.53	0.295	0.655	$28,524	$31,666	$60,190	26.0	0.00	0.000	0.000	$0	$0	$0
5					26.12	29.3	3.18	0.325	0.716	$19,841	$21,856	$41,697	26.0	0.00	0.000	0.000	$0	$0	$0
6					28.58	29.3	0.72	0.177	0.318	$10,540	$9,468	$20,009	26.0	0.00	0.000	0.000	$0	$0	$0
6					29.08	29.3	0.22	0.122	0.148	$6,693	$4,060	$10,753	26.0	0.00	0.000	0.000	$0	$0	$0
12					28.64	29.3	0.66	0.166	0.284	$10,355	$8,858	$19,213	26.0	0.00	0.000	0.000	$0	$0	$0
12					28.78	29.3	0.52	0.155	0.250	$12,569	$10,136	$22,705	26.0	0.00	0.000	0.000	$0	$0	$0
12					27.41	29.3	1.89	0.258	0.564	$21,749	$23,773	$45,522	26.0	0.00	0.000	0.000	$0	$0	$0
12					31.57	29.3	0.00	0.000	0.000	$0	$0	$0	26.0	0.00	0.000	0.000	$0	$0	$0
12					29.16	29.3	0.14	0.111	0.114	$4,978	$2,556	$7,535	26.0	0.00	0.000	0.000	$0	$0	$0
12					28.66	29.3	0.64	0.166	0.284	$11,778	$10,075	$21,853	26.0	0.00	0.000	0.000	$0	$0	$0
12					28.76	29.3	0.54	0.155	0.250	$7,690	$6,201	$13,891	26.0	0.00	0.000	0.000	$0	$0	$0
13					28.70	29.3	0.60	0.166	0.284	$11,308	$9,673	$20,981	26.0	0.00	0.000	0.000	$0	$0	$0
13					28.06	29.3	1.24	0.222	0.456	$16,055	$16,489	$32,544	26.0	0.00	0.000	0.000	$0	$0	$0
13					27.53	29.3	1.77	0.252	0.546	$16,075	$17,415	$33,490	26.0	0.00	0.000	0.000	$0	$0	$0
13					26.90	29.3	2.40	0.290	0.644	$27,048	$30,033	$57,081	26.0	0.00	0.000	0.000	$0	$0	$0
13					26.67	29.3	2.63	0.300	0.666	$21,867	$24,272	$46,139	26.0	0.00	0.000	0.000	$0	$0	$0
13					28.61	29.3	0.69	0.166	0.284	$10,239	$8,759	$18,997	26.0	0.00	0.000	0.000	$0	$0	$0
13					29.27	29.3	0.03	0.100	0.080	$9,699	$3,880	$13,579	26.0	0.00	0.000	0.000	$0	$0	$0
16					28.52	29.3	0.78	0.177	0.318	$18,447	$16,571	$35,018	26.0	0.00	0.000	0.000	$0	$0	$0
23					28.64	28.4	0.00	0.000	0.000	$0	$0	$0	28.4	0.00	0.000	0.000	$0	$0	$0
23					27.66	28.4	0.74	0.177	0.318	$6,661	$5,983	$12,644	28.4	0.74	0.177	0.318	$6,661	$5,983	$12,644
23					27.74	28.4	0.66	0.166	0.284	$6,348	$5,430	$11,778	28.4	0.66	0.166	0.284	$6,348	$5,430	$11,778
23					28.48	28.4	0.00	0.000	0.000	$0	$0	$0	28.4	0.00	0.000	0.000	$0	$0	$0
23					28.87	28.4	0.00	0.000	0.000	$0	$0	$0	28.4	0.00	0.000	0.000	$0	$0	$0
25					27.56	29.3	1.74	0.252	0.546	$12,459	$13,497	$25,956	29.3	1.74	0.252	0.546	$12,459	$13,497	$25,956
Total		46 residences	$3,276,320							$558,619	$552,338	$1,110,957					$45,701	$40,190	$85,892

Notes

1. Appraised values of structures (excluding land) per Hardin County Appraisal District.
2. Depth-damage factors per Galveston District, Corps of Engineers for Class 1 structures.
3. Value of structure contents estimated at 50% of structure value.

THIS RUN EXECUTED 01/16/89 19:02:36

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**********************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
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APPENDIX 6

HEC-2 COMPUTER MODEL OF COON MARSH GULLY AND COON MARSH GULLY DIVERSION DITCH (30' BW, 3:1 SS) AND BRIDGE IMPROVEMENTS

Run DD14

THIS RUN EXECUTED 01/13/89 17:16:51

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*********************************************
 HEC2 RELEASE DATED NOV 76 UPDATED MAY 1984
 ERROR CORR - 01,02,03,04,05,06
 MODIFICATION - 50,51,52,53,54,55,56
 IBM-PC-XT VERSION
*********************************************

FR
TI HARDIN COUNTY WCID NO. 1 FLOOD STUDY              JOB HD-002  JAN 1989  JNH
T2 100-YEAR FLOOD W/ CHIMP & NEW BRIDGES @ PW BLVD & BRN  COMPUTER FILE DD8W30
T3 COON MARSH GULLY & DIVERSION DITCH W/ 30'BW & 3:1 SS  START @ LP18 100-YR WS

J1  ICHECK    INQ      NINV     IDIR     STRT     METRIC   HVINS    Q        WSEL     FQ

      0.       8.       0.       0.   .000000      .00      .0       0.   27.500     .000

J2  NPROF     IPLOT    PRFVS    XSECV    XSECH    FN       ALLDC    IBW      CHNIM    ITRACE

     1.000     .000   -1.000     .000     .000     .000     .000    8.000     .000     .000

J3  VARIABLE CODES FOR SUMMARY PRINTOUT

    38.000   43.000   23.000   24.000    1.000    2.000    3.000   10.000   11.000   12.000

     5.000   33.000   38.000   38.000   39.000   42.000    1.000    4.000   30.000   89.000

    90.000   25.000   26.000   16.000   17.000   18.000     .000     .000     .000     .000

J5  LPRNT    NUMSEC                ********REQUESTED SECTION NUMBERS********

   -10.000  -10.000     .000     .000     .000     .000     .000     .000     .000     .000

NC      .060     .060     .040     .100     .300     .000     .000     .000     .000     .000
QT     7.000  180.000  230.000  420.000  560.000  790.000  960.000 1100.000     .000     .000
X1      .000    8.000 1000.000 1028.000     .000     .000     .000     .000     .000     .000
CI    -1.000   16.900     .000    3.000    3.000   10.000   20.000   30.000     .000     .000
GR    29.500  900.000   29.500  978.000   27.700 1000.000   18.700 1006.000   16.900 1022.000
GR    27.900 1028.000   27.900 1055.000   27.900 1100.000     .000     .000     .000     .000

X1   780.000    8.000 1000.000 1028.000  780.000  780.000  780.000     .000     .000     .000
CI    -1.000     .001     .000    3.000    3.000   10.000   20.000   30.000     .000     .000
GR    30.200  900.000   30.200  978.000   28.400 1000.000   19.400 1006.000   17.600 1022.000
GR    28.600 1028.000   28.600 1055.000   28.600 1100.000     .000     .000     .000     .000
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X1	3250.000	8.000	1000.000	1023.000	2470.000	2470.000	2470.000	.000	.000	.000
GR	28.700	900.000	28.700	1000.000	23.900	1007.000	22.700	1011.000	19.900	1013.000
GR	20.000	1018.000	27.800	1023.000	27.800	1100.000	.000	.000	.000	.000
X1	4800.000	.000	.000	.000	1550.000	1550.000	1550.000	.000	4.000	.000
NC	.120	.120	.040	.100	.300	.000	.000	.000	.000	.000
X1	13840.000	15.000	1475.000	1509.000	150.000	150.000	150.000	.000	.000	.000
GR	31.700	1000.000	31.900	1100.000	31.800	1200.000	31.800	1300.000	31.600	1400.000
GR	30.400	1475.000	24.800	1485.000	23.600	1495.000	24.400	1505.000	30.900	1509.000
GR	31.400	1600.000	31.800	1700.000	32.300	1800.000	32.200	1900.000	32.300	2000.000
NC	.015	.015	.015	.300	.500	.000	.000	.000	.000	.000
X1	13841.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
SB	1.250	1.500	2.500	200.000	30.000	1.500	368.000	2.000	21.350	21.390
X1	13879.000	.000	.000	.000	38.000	38.000	38.000	.000	.000	.000
X2	.000	.000	1.000	29.600	31.600	.000	.000	.000	.000	.000
NC	.120	.120	.040	.300	.500	.000	.000	.000	.000	.000
X1	13880.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
NC	.120	.120	.040	.100	.300	.000	.000	.000	.000	.000
X1	14930.000	44.000	1587.000	1611.000	1040.000	1100.000	1050.000	.000	.000	.000
CI	-1.000	.000	.000	3.000	3.000	10.000	20.000	30.000	.000	.000
GR	31.600	1000.000	31.400	1050.000	31.500	1100.000	31.900	1150.000	32.400	1165.000
GR	31.700	1200.000	31.700	1220.000	31.000	1255.000	31.200	1264.000	31.000	1273.000
GR	30.800	1278.000	28.700	1285.000	28.300	1288.000	28.500	1290.000	30.500	1295.000
GR	31.000	1300.000	30.700	1345.000	29.600	1430.000	30.500	1490.000	29.400	1520.000
GR	29.500	1548.000	28.700	1569.000	29.600	1582.000	28.800	1587.000	25.700	1597.000
GR	29.500	1600.000	25.100	1603.000	25.600	1607.000	27.700	1611.000	29.600	1620.000
GR	28.800	1633.000	30.300	1638.000	31.800	1644.000	29.500	1651.000	29.700	1700.000
GR	29.700	1750.000	29.800	1766.000	29.400	1770.000	30.600	1774.000	31.300	1800.000
GR	31.900	1900.000	32.500	1950.000	32.700	2000.000	33.000	2050.000	.000	.000
X1	16010.000	16.000	1501.000	1523.000	1020.000	1100.000	1080.000	.000	.000	.000
GR	30.800	1000.000	30.400	1100.000	29.800	1200.000	29.100	1300.000	28.900	1400.000
GR	29.100	1472.000	33.100	1481.000	29.400	1491.000	28.800	1501.000	24.100	1506.000
GR	24.700	1519.000	28.000	1523.000	30.500	1600.000	31.700	1700.000	32.600	1800.000
GR	34.600	1845.000	.000	.000	.000	.000	.000	.000	.000	.000
NC	.120	.120	.040	.100	.300	.000	.000	.000	.000	.000
QT	7.000	150.000	190.000	340.000	450.000	630.000	760.000	870.000	.000	.000
X1	17930.000	22.000	1205.000	1230.000	2060.000	1880.000	1920.000	.000	.000	.000
GR	32.100	705.000	31.700	800.000	31.200	900.000	30.900	1000.000	29.800	1100.000
GR	29.500	1200.000	29.200	1205.000	24.900	1211.000	25.500	1220.000	28.900	1230.000
GR	29.900	1300.000	30.600	1400.000	30.100	1500.000	30.200	1600.000	29.700	1700.000
GR	29.500	1800.000	31.100	1900.000	31.400	2000.000	32.100	2100.000	32.100	2200.000
GR	31.600	2300.000	32.100	2400.000	.000	.000	.000	.000	.000	.000

X1	19530.000	31.000	1280.000	1316.000	1420.000	1660.000	1600.000	.000	.000	.000
GR	30.700	1000.000	30.600	1050.000	30.500	1100.000	31.000	1150.000	30.700	1200.000
GR	30.500	1220.000	31.300	1264.000	31.600	1280.000	31.000	1285.000	29.900	1289.000
GR	27.400	1295.000	26.300	1296.000	26.100	1300.000	26.400	1304.000	27.600	1305.000
GR	28.400	1309.000	31.400	1316.000	31.600	1323.000	31.500	1328.000	32.000	1331.000
GR	31.700	1334.000	30.300	1338.000	30.100	1342.000	30.000	1360.000	30.700	1416.000
GR	30.000	1420.000	31.200	1427.000	32.200	1455.000	31.000	1500.000	31.600	1550.000
GR	31.200	1600.000	.000	.000	.000	.000	.000	.000	.000	.000
X1	19855.000	.000	.000	.000	325.000	325.000	325.000	.000	.000	.000
NC	.015	.015	.015	.300	.500	.000	.000	.000	.000	.000
X1	19856.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
SB	1.250	1.500	2.500	200.000	30.000	1.500	233.000	2.000	23.780	23.790
X1	19894.000	.000	.000	.000	38.000	38.000	38.000	.000	.000	.000
X2	.000	.000	1.000	29.600	31.600	.000	.000	.000	.000	.000
NC	.120	.120	.040	.300	.500	.000	.000	.000	.000	.000
X1	19895.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
NC	.120	.120	.040	.100	.300	.000	.000	.000	.000	.000
QT	7.000	110.000	140.000	250.000	340.000	470.000	560.000	630.000	.000	.000
X1	21660.000	9.000	1784.000	1821.000	2000.000	1400.000	1765.000	.000	.000	.000
CI	-1.000	-1.000	.000	3.000	3.000	10.000	20.000	30.000	.000	.000
GR	30.100	1500.000	32.200	1600.000	29.600	1700.000	29.500	1784.000	28.700	1800.000
GR	29.700	1821.000	29.700	1900.000	30.100	2000.000	30.500	2100.000	.000	.000
X1	21860.000	14.000	1792.000	1809.000	200.000	200.000	200.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	32.300	32.300	.000
GR	30.100	1500.000	32.200	1600.000	29.600	1700.000	29.500	1784.000	28.700	1792.000
GR	28.700	1797.000	28.700	1798.000	28.700	1803.000	28.700	1804.000	28.700	1809.000
GR	29.700	1821.000	29.700	1900.000	30.100	2000.000	30.500	2100.000	.000	.000
NC	.015	.015	.015	.300	.500	.000	.000	.000	.000	.000
X1	21861.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
CI	-1.000	.000	.000	3.000	3.000	.010	.010	.010	.000	.000
BT	22.000	1500.000	32.800	32.800	1500.000	32.800	30.100	1600.000	33.000	32.200
BT	1700.000	33.200	29.600	1784.000	33.200	29.500	1792.000	33.300	28.700	1792.000
BT	33.300	32.700	1797.000	33.300	32.700	1797.000	33.300	28.700	1798.000	33.300
BT	28.700	1798.000	33.300	32.700	1803.000	33.300	32.700	1803.000	33.300	28.700
BT	1804.000	33.300	28.700	1804.000	33.300	32.700	1809.000	33.300	32.700	1809.000
BT	33.300	28.700	1821.000	33.300	29.700	1900.000	33.100	29.700	2000.000	32.800
BT	30.100	2100.000	32.800	30.500	2100.000	32.800	32.800	.000	.000	.000
X1	21941.000	.000	.000	.000	80.000	80.000	80.000	.000	.000	.000
X2	.000	.000	.000	.000	.000	.000	1.000	.000	.000	.000

MC	.120	.120	.050	.300	.500	.000	.000	.000	.000	.000
X1	21942.000	.000	.000	.000	1.000	1.000	1.000	.000	.000	.000
X3	10.000	.000	.000	.000	.000	.000	.000	32.800	32.800	.000
X1	22142.000	9.000	1784.000	1821.000	200.000	200.000	200.000	.000	.000	.000
GR	30.100	1500.000	32.200	1600.000	29.600	1700.000	29.500	1784.000	28.700	1800.000
GR	29.700	1821.000	29.700	1900.000	30.100	2000.000	30.500	2100.000	.000	.000
EJ	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

THIS RUN EXECUTED 01/13/89 17:18:53

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
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T1 HARDIN COUNTY WCID NO. 1 FLOOD STUDY JOB HD-002 JAN 1989 JNH
T2 50-YEAR FLOOD W/ CHIMP & NEW BRIDGES @ PW BLVD & BRN COMPUTER FILE DDBW30
T3 COON MARSH GULLY & DIVERSION DITCH W/ 30'BW & 3:1 SS START @ LPIB 50-YR WS

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	7.	0.	0.	.000000	.00	.0	0.	26.600	.000

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	2.000	.000	-1.000	.000	.000	.000	.000	8.000	.000	.000

THIS RUN EXECUTED 01/13/89 17:19:20

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  HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
  ERROR CORR -  01,02,03,04,05,06
  MODIFICATION -  50,51,52,53,54,55,56
  IBM-PC-XT VERSION
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T1 HARDIN COUNTY WCID NO. 1 FLOOD STUDY JOB HD-002 JAN 1989 JNH
T2 25-YEAR FLOOD W/ CHIMP & NEW BRIDGES @ PW BLVD & BRN COMPUTER FILE DDBW30
T3 COON MARSH GULLY & DIVERSION DITCH W/ 30'BW & 3:1 SS START @ LPIB 25-YR WS

J1	ICHECK	INQ	NINV	IDIR	STRT	METRIC	HVINS	Q	WSEL	FQ
	0.	6.	0.	0.	.000000	.00	.0	0.	25.500	.000

J2	NPROF	IPLOT	PRFVS	XSECV	XSECH	FN	ALLDC	IBW	CHNIM	ITRACE
	3.000	.000	-1.000	.000	.000	.000	.000	8.000	.000	.000

THIS RUN EXECUTED 01/13/89 17:20:14

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 HEC2 RELEASE DATED NOV 76 UPDATED MAY  1984
 ERROR CORR -  01,02,03,04,05,06
 MODIFICATION -  50,51,52,53,54,55,56
 IBM-PC-XT VERSION
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NOTE- ASTERISK (*) AT LEFT OF CROSS-SECTION NUMBER INDICATES MESSAGE IN SUMMARY OF ERRORS LIST

MARSH GULLY & DIVERSION

SUMMARY PRINTOUT

SECNO	Q	XLBEL	RBEL	CWSEL	CRIWS	EG	HV	HL	OLOSS	10K*S	K*CHSL	SECNO
.000	1100.00	29.50	27.90	27.50	.00	27.54	.04	.00	.00	1.60	.00	.00
.000	960.00	29.50	27.90	26.60	.00	26.64	.04	.00	.00	1.76	.00	.00
.000	790.00	29.50	27.90	25.50	.00	25.54	.04	.00	.00	1.93	.00	.00
.000	560.00	29.50	27.90	24.00	.00	24.04	.04	.00	.00	2.08	.00	.00
780.000	1100.00	30.20	28.60	27.63	.00	27.69	.05	.14	.00	2.02	.90	780.00
780.000	960.00	30.20	28.60	26.75	.00	26.80	.05	.15	.00	2.23	.90	780.00
780.000	790.00	30.20	28.60	25.67	.00	25.72	.05	.17	.00	2.51	.90	780.00
780.000	560.00	30.20	28.60	24.18	.00	24.23	.05	.19	.00	2.81	.90	780.00
3250.000	1100.00	28.70	27.80	28.28	.00	28.37	.08	.67	.01	3.87	.90	3250.00
3250.000	960.00	28.70	27.80	27.49	.00	27.57	.09	.76	.01	4.53	.90	3250.00
3250.000	790.00	28.70	27.80	26.51	.00	26.59	.09	.87	.01	5.24	.90	3250.00
3250.000	560.00	28.70	27.80	25.15	.00	25.23	.08	1.00	.01	6.27	.90	3250.00
4800.000	1100.00	32.70	31.80	28.98	.00	29.09	.11	.72	.01	5.64	.90	4800.00
4800.000	960.00	32.70	31.80	28.29	.00	28.40	.11	.82	.01	6.22	.90	4800.00
4800.000	790.00	32.70	31.80	27.43	.00	27.53	.11	.93	.01	6.98	.90	4800.00
4800.000	560.00	32.70	31.80	26.23	.00	26.33	.10	1.09	.00	7.91	.90	4800.00
13840.000	1100.00	30.82	31.05	29.07	.00	29.18	.11	.09	.00	5.81	.90	13840.00
13840.000	960.00	30.82	31.05	28.38	.00	28.49	.11	.09	.00	6.39	.90	13840.00
13840.000	790.00	30.82	31.05	27.53	.00	27.64	.11	.11	.00	7.14	.90	13840.00
13840.000	560.00	30.82	31.05	26.35	.00	26.45	.10	.12	.00	8.03	.90	13840.00
13841.000	1100.00	30.82	31.05	29.07	.00	29.18	.11	.00	.00	.81	.90	13841.00
13841.000	960.00	30.82	31.05	28.38	.00	28.49	.11	.00	.00	.89	.90	13841.00
13841.000	790.00	30.82	31.05	27.53	.00	27.64	.11	.00	.00	1.00	.90	13841.00
13841.000	560.00	30.82	31.05	26.35	.00	26.45	.10	.00	.00	1.12	.90	13841.00
13879.000	1100.00	30.82	31.05	29.07	.00	29.19	.11	.01	.00	.83	.90	13879.00
13879.000	960.00	30.82	31.05	28.39	.00	28.50	.11	.01	.00	.91	.90	13879.00
13879.000	790.00	30.82	31.05	27.54	.00	27.65	.11	.01	.00	1.02	.90	13879.00
13879.000	560.00	30.82	31.05	26.36	.00	26.46	.10	.01	.00	1.15	.90	13879.00

SECNO	Q	XLBEL	RBEL	CWSEL	CRIWS	EG	HV	HL	OLOSS	1OK*S	K*CHSL	SECNO
13880.000	1100.00	30.82	31.05	29.07	.00	29.19	.11	.00	.00	5.87	.90	13880.00
13880.000	960.00	30.82	31.05	28.39	.00	28.50	.11	.00	.00	6.46	.90	13880.00
13880.000	790.00	30.82	31.05	27.54	.00	27.65	.11	.00	.00	7.23	.90	13880.00
13880.000	560.00	30.82	31.05	26.36	.00	26.46	.10	.00	.00	8.16	.90	13880.00
14930.000	1100.00	28.94	31.41	29.66	.00	29.77	.11	.58	.00	5.18	.40	14930.00
14930.000	960.00	28.94	31.41	29.03	.00	29.14	.10	.63	.00	5.67	.40	14930.00
14930.000	790.00	28.94	31.41	28.25	.00	28.34	.10	.69	.00	6.06	.40	14930.00
14930.000	560.00	28.94	31.41	27.13	.00	27.21	.08	.75	.00	6.32	.40	14930.00
16010.000	1100.00	29.97	28.77	30.18	.00	30.27	.08	.50	.00	4.15	.40	16010.00
16010.000	960.00	29.97	28.77	29.61	.00	29.70	.09	.56	.00	4.83	.40	16010.00
16010.000	790.00	29.97	28.77	28.87	.00	28.96	.09	.62	.00	5.37	.40	16010.00
16010.000	560.00	29.97	28.77	27.77	.00	27.84	.07	.63	.00	5.45	.40	16010.00
17930.000	870.00	29.55	29.20	30.83	.00	30.88	.05	.61	.00	2.32	.40	17930.00
17930.000	760.00	29.55	29.20	30.36	.00	30.41	.05	.71	.00	2.74	.40	17930.00
17930.000	630.00	29.55	29.20	29.71	.00	29.76	.05	.80	.00	3.17	.40	17930.00
17930.000	450.00	29.55	29.20	28.63	.00	28.67	.05	.83	.00	3.32	.40	17930.00
19530.000	870.00	31.23	31.16	31.27	.00	31.33	.06	.45	.01	3.42	.40	19530.00
19530.000	760.00	31.23	31.16	30.85	.00	30.91	.06	.49	.00	3.52	.40	19530.00
19530.000	630.00	31.23	31.16	30.24	.00	30.30	.06	.53	.00	3.51	.40	19530.00
19530.000	450.00	31.23	31.16	29.17	.00	29.22	.05	.55	.00	3.53	.40	19530.00
19855.000	870.00	31.24	31.23	31.38	.00	31.44	.06	.11	.00	3.36	.40	19855.00
19855.000	760.00	31.24	31.23	30.96	.00	31.02	.06	.11	.00	3.50	.40	19855.00
19855.000	630.00	31.24	31.23	30.36	.00	30.41	.06	.11	.00	3.55	.40	19855.00
19855.000	450.00	31.24	31.23	29.29	.00	29.34	.05	.12	.00	3.58	.40	19855.00
19856.000	870.00	31.24	31.23	31.40	.00	31.44	.04	.00	.01	.36	.40	19856.00
19856.000	760.00	31.24	31.23	30.97	.00	31.03	.05	.00	.00	.45	.40	19856.00
19856.000	630.00	31.24	31.23	30.36	.00	30.41	.06	.00	.00	.49	.40	19856.00
19856.000	450.00	31.24	31.23	29.29	.00	29.34	.05	.00	.00	.50	.40	19856.00
19894.000	870.00	31.24	31.24	31.68	.00	31.71	.03	.27	.00	.26	.40	19894.00
19894.000	760.00	31.24	31.24	31.18	.00	31.22	.04	.19	.00	.36	.40	19894.00
19894.000	630.00	31.24	31.24	30.47	.00	30.53	.05	.11	.00	.46	.40	19894.00
19894.000	450.00	31.24	31.24	29.29	.00	29.34	.05	.00	.00	.51	.40	19894.00
19895.000	870.00	31.24	31.24	31.67	.00	31.72	.05	.00	.01	2.59	.40	19895.00
19895.000	760.00	31.24	31.24	31.17	.00	31.23	.05	.00	.01	3.01	.40	19895.00
19895.000	630.00	31.24	31.24	30.47	.00	30.53	.05	.00	.00	3.32	.40	19895.00
19895.000	450.00	31.24	31.24	29.29	.00	29.34	.05	.00	.00	3.60	.40	19895.00
21660.000	630.00	29.50	29.70	32.23	.00	32.24	.01	.52	.00	3.73	2.78	21660.00
21660.000	560.00	29.50	29.70	31.85	.00	31.87	.02	.64	.00	5.09	2.78	21660.00
21660.000	470.00	29.50	29.70	31.33	.00	31.35	.03	.82	.00	8.89	2.78	21660.00
21660.000	340.00	29.50	29.70	30.52	30.13	30.60	.09	1.25	.01	34.36	2.78	21660.00

	SECNO	Q	XLBEL	RBEL	CWSEL	CRIWS	EG	HV	HL	OLOSS	10K*S	K*CHSL	SECNO
	21860.000	630.00	29.50	29.43	32.09	.00	32.55	.46	.18	.13	43.48	.00	21860.00
	21860.000	560.00	29.50	29.43	31.78	.00	32.23	.44	.23	.13	47.42	.00	21860.00
	21860.000	470.00	29.50	29.43	31.42	.00	31.82	.40	.35	.11	51.30	.00	21860.00
	21860.000	340.00	29.50	29.43	31.13	.00	31.39	.27	.74	.05	39.55	.00	21860.00
*	21861.000	630.00	28.70	28.70	33.30	33.30	33.46	.16	.00	.09	22.02	.00	21861.00
*	21861.000	560.00	28.70	28.70	33.31	33.31	33.43	.12	.00	.10	16.64	.00	21861.00
*	21861.000	470.00	28.70	28.70	31.81	31.81	33.39	1.57	.01	.59	66.79	.00	21861.00
*	21861.000	340.00	28.70	28.70	31.20	31.20	32.48	1.28	.00	.50	62.13	.00	21861.00
	21941.000	630.00	28.70	28.70	33.53	.00	33.58	.05	.08	.03	6.23	.00	21941.00
	21941.000	560.00	28.70	28.70	33.48	.00	33.53	.05	.08	.02	6.30	.00	21941.00
	21941.000	470.00	28.70	28.70	33.87	.00	33.88	.01	.02	.47	.86	.00	21941.00
	21941.000	340.00	28.70	28.70	32.37	31.20	32.96	.59	.28	.21	22.84	.00	21941.00
	21942.000	630.00	28.70	28.70	33.59	.00	33.59	.00	.00	.01	1.04	.00	21942.00
	21942.000	560.00	28.70	28.70	33.54	.00	33.54	.00	.00	.01	.86	.00	21942.00
	21942.000	470.00	28.70	28.70	33.88	.00	33.88	.00	.00	.00	.45	.00	21942.00
	21942.000	340.00	28.70	28.70	32.62	.00	33.02	.40	.00	.06	47.41	.00	21942.00
	22142.000	630.00	29.50	29.70	33.61	.00	33.61	.00	.02	.00	.93	.00	22142.00
	22142.000	560.00	29.50	29.70	33.56	.00	33.56	.00	.02	.00	.77	.00	22142.00
	22142.000	470.00	29.50	29.70	33.89	.00	33.89	.00	.01	.00	.40	.00	22142.00
	22142.000	340.00	29.50	29.70	33.17	.00	33.17	.00	.03	.12	.42	.00	22142.00

MARSH GULLY & DIVERSION

SUMMARY PRINTOUT

SECNO	XLCH	ELMIN	CWSEL	TOPWID	BW	VEXR	VEXT	AREA	VCH	K*XNL	K*XNCH	K*XNR
.000	.00	16.90	27.50	93.60	30.00	.00	.00	655.08	1.68	60.00	40.00	60.00
.000	.00	16.90	26.60	88.20	30.00	.00	.00	573.27	1.67	60.00	40.00	60.00
.000	.00	16.90	25.50	81.60	30.00	.00	.00	479.88	1.65	60.00	40.00	60.00
.000	.00	16.90	24.00	72.60	30.00	.00	.00	364.23	1.54	60.00	40.00	60.00
780.000	780.00	17.60	27.63	90.14	30.00	14.69	14.69	602.06	1.83	60.00	40.00	60.00
780.000	780.00	17.60	26.75	84.84	30.00	14.69	14.69	524.86	1.83	60.00	40.00	60.00
780.000	780.00	17.60	25.67	78.34	30.00	14.69	14.69	436.38	1.81	60.00	40.00	60.00
780.000	780.00	17.60	24.18	69.42	30.00	14.69	14.69	326.59	1.71	60.00	40.00	60.00
3250.000	2470.00	19.82	28.28	128.88	30.00	39.53	54.22	492.11	2.33	60.00	40.00	60.00
3250.000	2470.00	19.82	27.49	75.97	30.00	39.53	54.22	405.97	2.36	60.00	40.00	60.00
3250.000	2470.00	19.82	26.51	70.10	30.00	39.53	54.22	334.49	2.36	60.00	40.00	60.00
3250.000	2470.00	19.82	25.15	61.98	30.00	39.53	54.22	245.10	2.28	60.00	40.00	60.00
4800.000	1550.00	21.22	28.98	76.59	30.00	27.04	81.26	413.79	2.66	60.00	40.00	60.00
4800.000	1550.00	21.22	28.29	72.41	30.00	27.04	81.26	361.92	2.65	60.00	40.00	60.00
4800.000	1550.00	21.22	27.43	67.24	30.00	27.04	81.26	301.74	2.62	60.00	40.00	60.00
4800.000	1550.00	21.22	26.23	60.07	30.00	27.04	81.26	225.70	2.48	60.00	40.00	60.00
13840.000	150.00	21.35	29.07	76.24	30.00	2.66	83.92	409.43	2.69	120.00	40.00	120.00
13840.000	150.00	21.35	28.38	72.12	30.00	2.66	83.92	358.47	2.68	120.00	40.00	120.00
13840.000	150.00	21.35	27.53	67.02	30.00	2.66	83.92	299.33	2.64	120.00	40.00	120.00
13840.000	150.00	21.35	26.35	59.95	30.00	2.66	83.92	224.49	2.49	120.00	40.00	120.00
13841.000	1.00	21.35	29.07	76.28	30.00	.01	83.94	409.89	2.68	15.00	15.00	15.00
13841.000	1.00	21.35	28.38	72.16	30.00	.01	83.94	358.90	2.67	15.00	15.00	15.00
13841.000	1.00	21.35	27.53	67.06	30.00	.01	83.94	299.75	2.64	15.00	15.00	15.00
13841.000	1.00	21.35	26.35	59.99	30.00	.01	83.94	224.86	2.49	15.00	15.00	15.00
13879.000	38.00	21.39	29.07	76.12	30.00	.52	84.46	407.84	2.70	15.00	15.00	15.00
13879.000	38.00	21.39	28.39	72.00	30.00	.52	84.46	356.98	2.69	15.00	15.00	15.00
13879.000	38.00	21.39	27.54	66.90	30.00	.52	84.46	297.98	2.65	15.00	15.00	15.00
13879.000	38.00	21.39	26.36	59.83	30.00	.52	84.46	223.26	2.51	15.00	15.00	15.00
13880.000	1.00	21.39	29.07	76.11	30.00	.01	84.47	407.78	2.70	120.00	40.00	120.00
13880.000	1.00	21.39	28.39	71.99	30.00	.01	84.47	356.92	2.69	120.00	40.00	120.00
13880.000	1.00	21.39	27.54	66.90	30.00	.01	84.47	297.93	2.65	120.00	40.00	120.00
13880.000	1.00	21.39	26.36	59.82	30.00	.01	84.47	223.21	2.51	120.00	40.00	120.00
14930.000	1050.00	21.81	29.66	187.87	30.00	13.49	97.96	446.12	2.61	120.00	40.00	120.00
14930.000	1050.00	21.81	29.03	82.91	30.00	13.49	97.96	376.91	2.57	120.00	40.00	120.00
14930.000	1050.00	21.81	28.25	68.62	30.00	13.49	97.96	317.41	2.49	120.00	40.00	120.00
14930.000	1050.00	21.81	27.13	61.91	30.00	13.49	97.96	244.41	2.29	120.00	40.00	120.00

	SECNO	XLCH	ELMIN	CWSEL	TOPWID	BW	VEXR	VEXT	AREA	VCH	K*XNL	K*XNCH	K*XNR
	16010.000	1080.00	22.24	30.18	454.36	30.00	12.13	110.09	746.18	2.40	120.00	40.00	120.00
	16010.000	1080.00	22.24	29.61	343.70	30.00	12.13	110.09	517.84	2.44	120.00	40.00	120.00
	16010.000	1080.00	22.24	28.87	72.70	30.00	12.13	110.09	330.90	2.39	120.00	40.00	120.00
	16010.000	1080.00	22.24	27.77	63.18	30.00	12.13	110.09	257.62	2.17	120.00	40.00	120.00
	17930.000	1920.00	23.01	30.83	876.82	30.00	18.38	128.47	1058.79	1.84	120.00	40.00	120.00
	17930.000	1920.00	23.01	30.36	722.53	30.00	18.38	128.47	673.43	1.89	120.00	40.00	120.00
	17930.000	1920.00	23.01	29.71	272.04	30.00	18.38	128.47	361.05	1.87	120.00	40.00	120.00
	17930.000	1920.00	23.01	28.63	63.71	30.00	18.38	128.47	263.21	1.71	120.00	40.00	120.00
	19530.000	1600.00	23.65	31.27	469.07	30.00	16.49	144.95	636.59	2.06	120.00	40.00	120.00
	19530.000	1600.00	23.65	30.85	360.55	30.00	16.49	144.95	462.03	2.01	120.00	40.00	120.00
	19530.000	1600.00	23.65	30.24	112.44	30.00	16.49	144.95	334.42	1.92	120.00	40.00	120.00
	19530.000	1600.00	23.65	29.17	63.15	30.00	16.49	144.95	257.31	1.75	120.00	40.00	120.00
	19855.000	325.00	23.78	31.38	497.19	30.00	3.81	148.76	676.45	2.04	120.00	40.00	120.00
	19855.000	325.00	23.78	30.96	396.20	30.00	3.81	148.76	493.51	2.01	120.00	40.00	120.00
	19855.000	325.00	23.78	30.36	123.59	30.00	3.81	148.76	338.25	1.93	120.00	40.00	120.00
	19855.000	325.00	23.78	29.29	63.04	30.00	3.81	148.76	256.16	1.76	120.00	40.00	120.00
	19856.000	1.00	23.78	31.40	506.50	30.00	.01	148.78	693.47	1.79	15.00	15.00	15.00
	19856.000	1.00	23.78	30.97	398.57	30.00	.01	148.78	496.28	1.91	15.00	15.00	15.00
	19856.000	1.00	23.78	30.36	124.22	30.00	.01	148.78	339.00	1.92	15.00	15.00	15.00
	19856.000	1.00	23.78	29.29	63.06	30.00	.01	148.78	256.41	1.76	15.00	15.00	15.00
	19894.000	38.00	23.79	31.68	566.12	30.00	.44	149.21	844.59	1.56	15.00	15.00	15.00
	19894.000	38.00	23.79	31.18	444.81	30.00	.44	149.21	586.57	1.74	15.00	15.00	15.00
	19894.000	38.00	23.79	30.47	135.91	30.00	.44	149.21	353.20	1.87	15.00	15.00	15.00
	19894.000	38.00	23.79	29.29	62.99	30.00	.44	149.21	255.65	1.76	15.00	15.00	15.00
	19895.000	1.00	23.80	31.67	566.12	30.00	.01	149.23	844.57	1.86	120.00	40.00	120.00
	19895.000	1.00	23.80	31.17	444.81	30.00	.01	149.23	586.55	1.89	120.00	40.00	120.00
	19895.000	1.00	23.80	30.47	135.91	30.00	.01	149.23	353.18	1.88	120.00	40.00	120.00
	19895.000	1.00	23.80	29.29	62.99	30.00	.01	149.23	255.62	1.76	120.00	40.00	120.00
	21660.000	1765.00	28.70	32.23	600.00	30.00	10.58	159.81	1215.40	1.62	120.00	40.00	120.00
	21660.000	1765.00	28.70	31.85	569.63	30.00	10.58	159.81	994.49	1.75	120.00	40.00	120.00
	21660.000	1765.00	28.70	31.33	524.62	30.00	10.58	159.81	708.40	2.04	120.00	40.00	120.00
	21660.000	1765.00	28.70	30.52	454.86	30.00	10.58	159.81	311.53	3.10	120.00	40.00	120.00
	21860.000	200.00	28.70	32.09	34.58	30.00	.07	159.87	115.59	5.45	120.00	40.00	120.00
	21860.000	200.00	28.70	31.78	34.58	30.00	.07	159.87	104.93	5.34	120.00	40.00	120.00
	21860.000	200.00	28.70	31.42	34.58	30.00	.07	159.87	92.26	5.09	120.00	40.00	120.00
	21860.000	200.00	28.70	31.13	34.58	30.00	.07	159.87	82.13	4.14	120.00	40.00	120.00
*	21861.000	1.00	28.70	33.30	600.00	.01	.07	159.87	223.88	4.16	15.00	15.00	15.00
*	21861.000	1.00	28.70	33.31	600.00	.01	.07	159.87	228.21	3.62	15.00	15.00	15.00
*	21861.000	1.00	28.70	31.81	566.65	.01	.07	159.87	46.69	10.07	15.00	15.00	15.00
*	21861.000	1.00	28.70	31.20	514.01	.01	.07	159.87	37.52	9.06	15.00	15.00	15.00

SECNO	XLCH	ELMIN	CWSEL	TOPWID	BW	VEXR	VEXT	AREA	VCH	K*XNL	K*XNCH	K*XNR
21941.000	80.00	28.70	33.53	600.00	.01	.07	159.87	358.41	2.30	15.00	15.00	15.00
21941.000	80.00	28.70	33.48	600.00	.01	.07	159.87	329.40	2.30	15.00	15.00	15.00
21941.000	80.00	28.70	33.87	600.00	.01	.07	159.87	561.01	.91	15.00	15.00	15.00
21941.000	80.00	28.70	32.37	600.00	.01	.07	159.87	55.10	6.17	15.00	15.00	15.00
21942.000	1.00	28.70	33.59	600.00	.01	.07	159.87	2030.21	.87	120.00	50.00	120.00
21942.000	1.00	28.70	33.54	600.00	.01	.07	159.87	1999.98	.79	120.00	50.00	120.00
21942.000	1.00	28.70	33.88	600.00	.01	.07	159.87	2197.08	.60	120.00	50.00	120.00
21942.000	1.00	28.70	32.62	17.00	.01	.07	159.87	66.75	5.09	120.00	50.00	120.00
22142.000	200.00	28.70	33.61	600.00	.01	.07	159.87	2034.21	.77	120.00	50.00	120.00
22142.000	200.00	28.70	33.56	600.00	.01	.07	159.87	2001.99	.70	120.00	50.00	120.00
22142.000	200.00	28.70	33.89	600.00	.01	.07	159.87	2202.83	.53	120.00	50.00	120.00
22142.000	200.00	28.70	33.17	600.00	.01	.07	159.87	1770.82	.49	120.00	50.00	120.00

SUMMARY OF ERRORS AND SPECIAL NOTES

CAUTION SECNO= 21861.000 PROFILE= 1 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 21861.000 PROFILE= 1 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 21861.000 PROFILE= 1 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 21861.000 PROFILE= 2 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 21861.000 PROFILE= 2 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 21861.000 PROFILE= 2 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 21861.000 PROFILE= 3 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 21861.000 PROFILE= 3 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 21861.000 PROFILE= 3 20 TRIALS ATTEMPTED TO BALANCE WSEL
CAUTION SECNO= 21861.000 PROFILE= 4 CRITICAL DEPTH ASSUMED
CAUTION SECNO= 21861.000 PROFILE= 4 PROBABLE MINIMUM SPECIFIC ENERGY
CAUTION SECNO= 21861.000 PROFILE= 4 20 TRIALS ATTEMPTED TO BALANCE WSEL

HARDIN COUNTY MCID #
COMPUTATION OF EXPECTED FLOOD DAMAGE
LITTLE PINE ISLAND BAYOU 50-YEAR FLOOD
Job No. HD-002 July 12, 1989 File LPI850.wk1 JNH

					Existing Conditions 50-Year Flood								Proposed Conditions 50-Year Flood (Coon Harsh Gully Improvements and Levee Improvements Along Clemmons Gully)						
Block	Lot	Street Address	Appraised Value of Structure	Owner	Slab Elevation (feet msl)	Flood Elevation (feet msl)	Depth of Flooding (feet)	Depth-Damage Factor		Flood Damage			Flood Elevation (feet msl)	Depth of Flooding (feet)	Depth-Damage Factor		Flood Damage		
								Structure	Contents	Structure	Contents	Total			Structure	Contents	Structure	Contents	Total
3					?	28.2	?	0.000	0.000	$0	$0	$0	28.2	?	0.000	0.000	$0	$0	$0
4					29.23	28.2	0.00	0.000	0.000	$0	$0	$0	28.2	0.00	0.000	0.000	$0	$0	$0
4					28.55	28.2	0.00	0.000	0.000	$0	$0	$0	28.2	0.00	0.000	0.000	$0	$0	$0
5					29.14	28.2	0.00	0.000	0.000	$0	$0	$0	25.5	0.00	0.000	0.000	$0	$0	$0
5					29.96	28.2	0.00	0.000	0.000	$0	$0	$0	25.5	0.00	0.000	0.000	$0	$0	$0
5					?	28.2	?	0.000	0.000	$0	$0	$0	25.5	?	0.000	0.000	$0	$0	$0
5					30.70	28.2	0.00	0.000	0.000	$0	$0	$0	25.5	0.00	0.000	0.000	$0	$0	$0
5					29.47	28.2	0.00	0.000	0.000	$0	$0	$0	25.5	0.00	0.000	0.000	$0	$0	$0
5					28.32	28.2	0.00	0.000	0.000	$0	$0	$0	25.5	0.00	0.000	0.000	$0	$0	$0
5					27.21	28.2	0.99	0.199	0.386	$19,890	$19,290	$39,180	25.5	0.00	0.000	0.000	$0	$0	$0
5					27.12	28.2	1.08	0.210	0.420	$16,760	$16,760	$33,520	25.5	0.00	0.000	0.000	$0	$0	$0
5					28.78	28.2	0.00	0.000	0.000	$0	$0	$0	25.5	0.00	0.000	0.000	$0	$0	$0
5					28.00	28.2	0.20	0.111	0.114	$8,793	$4,516	$13,309	25.5	0.00	0.000	0.000	$0	$0	$0
5					28.81	28.2	0.00	0.000	0.000	$0	$0	$0	25.5	0.00	0.000	0.000	$0	$0	$0
5					29.31	28.2	0.00	0.000	0.000	$0	$0	$0	25.5	0.00	0.000	0.000	$0	$0	$0
5					26.76	28.2	1.44	0.234	0.492	$22,621	$23,781	$46,402	25.5	0.00	0.000	0.000	$0	$0	$0
5					26.96	28.2	1.24	0.222	0.456	$15,538	$15,958	$31,496	25.5	0.00	0.000	0.000	$0	$0	$0
5					26.13	28.2	2.07	0.270	0.600	$20,258	$22,509	$42,767	25.5	0.00	0.000	0.000	$0	$0	$0
5					26.22	28.2	1.98	0.264	0.582	$18,137	$19,992	$38,129	25.5	0.00	0.000	0.000	$0	$0	$0
5					27.74	28.2	0.46	0.144	0.216	$6,800	$5,100	$11,899	25.5	0.00	0.000	0.000	$0	$0	$0
5					26.78	28.2	1.42	0.234	0.492	$21,203	$22,290	$43,493	25.5	0.00	0.000	0.000	$0	$0	$0
5					26.77	28.2	1.43	0.234	0.492	$22,625	$23,786	$46,411	25.5	0.00	0.000	0.000	$0	$0	$0
5					26.12	28.2	2.08	0.270	0.600	$16,484	$18,315	$34,799	25.5	0.00	0.000	0.000	$0	$0	$0
6					28.58	28.2	0.00	0.000	0.000	$0	$0	$0	25.5	0.00	0.000	0.000	$0	$0	$0
6					29.08	28.2	0.00	0.000	0.000	$0	$0	$0	25.5	0.00	0.000	0.000	$0	$0	$0
12					28.64	28.2	0.00	0.000	0.000	$0	$0	$0	25.5	0.00	0.000	0.000	$0	$0	$0
12					28.78	28.2	0.00	0.000	0.000	$0	$0	$0	25.5	0.00	0.000	0.000	$0	$0	$0
12					27.41	28.2	0.79	0.177	0.318	$14,921	$13,404	$28,325	25.5	0.00	0.000	0.000	$0	$0	$0
12					31.57	28.2	0.00	0.000	0.000	$0	$0	$0	25.5	0.00	0.000	0.000	$0	$0	$0
12					29.16	28.2	0.00	0.000	0.000	$0	$0	$0	25.5	0.00	0.000	0.000	$0	$0	$0
12					28.66	28.2	0.00	0.000	0.000	$0	$0	$0	25.5	0.00	0.000	0.000	$0	$0	$0
12					28.76	28.2	0.00	0.000	0.000	$0	$0	$0	25.5	0.00	0.000	0.000	$0	$0	$0
13					28.70	28.2	0.00	0.000	0.000	$0	$0	$0	25.5	0.00	0.000	0.000	$0	$0	$0
13					28.06	28.2	0.14	0.111	0.114	$8,028	$4,122	$12,150	25.5	0.00	0.000	0.000	$0	$0	$0
13					27.53	28.2	0.67	0.166	0.284	$10,589	$9,058	$19,647	25.5	0.00	0.000	0.000	$0	$0	$0
13					26.90	28.2	1.30	0.228	0.474	$21,266	$22,105	$43,371	25.5	0.00	0.000	0.000	$0	$0	$0
13					26.67	28.2	1.53	0.240	0.510	$17,494	$18,587	$36,081	25.5	0.00	0.000	0.000	$0	$0	$0
13					28.61	28.2	0.00	0.000	0.000	$0	$0	$0	25.5	0.00	0.000	0.000	$0	$0	$0
13					29.27	28.2	0.00	0.000	0.000	$0	$0	$0	25.5	0.00	0.000	0.000	$0	$0	$0
16					28.52	28.2	0.00	0.000	0.000	$0	$0	$0	25.5	0.00	0.000	0.000	$0	$0	$0
23					28.64	27.4	0.00	0.000	0.000	$0	$0	$0	27.4	0.00	0.000	0.000	$0	$0	$0
23					27.66	27.4	0.00	0.000	0.000	$0	$0	$0	27.4	0.00	0.000	0.000	$0	$0	$0
23					27.74	27.4	0.00	0.000	0.000	$0	$0	$0	27.4	0.00	0.000	0.000	$0	$0	$0
23					28.48	27.4	0.00	0.000	0.000	$0	$0	$0	27.4	0.00	0.000	0.000	$0	$0	$0
23					28.87	27.4	0.00	0.000	0.000	$0	$0	$0	27.4	0.00	0.000	0.000	$0	$0	$0
25					27.56	28.2	0.64	0.166	0.284	$8,207	$7,020	$15,228	28.2	0.64	0.166	0.284	$8,207	$7,020	$15,228
Total	46 residences		$3,276,320							$269,612	$266,592	$536,205					$8,207	$7,020	$15,228

Notes

1. Appraised values of structures (excluding land) per Hardin County Appraisal District.
2. Depth-damage factors per Galveston District, Corps of Engineers for Class 1 structures.
3. Value of structure contents estimated at 50% of structure value.

HARDIN COUNTY WCID
COMPUTATION OF EXPECTED FL DAMAGE
LITTLE PINE ISLAND BAYOU 25-YEAR FLOOD
Job No. HD-002 July 12, 1989 File LPI825.wk1 JNH

					Existing Conditions 25-Year Flood								Proposed Conditions 25-Year Flood (Coon Marsh Gully Improvements and Levee Improvements Along Clemons Gully)						
			Appraised		Slab	Flood	Depth of	Depth-Damage Factor		Flood Damage			Flood	Depth of	Depth-Damage Factor		Flood Damage		
Block	Lot	Street Address	Value of Structure	Owner	Elevation (feet msl)	Elevation (feet msl)	Flooding (feet)	Structure	Contents	Structure	Contents	Total	Elevation (feet msl)	Flooding (feet)	Structure	Contents	Structure	Contents	Total
3					?	26.9	?	0.000	0.000	$0	$0	$0	26.9	?	0.000	0.000	$0	$0	$0
4					29.23	26.9	0.00	0.000	0.000	$0	$0	$0	26.9	0.00	0.000	0.000	$0	$0	$0
4					28.55	26.9	0.00	0.000	0.000	$0	$0	$0	26.9	0.00	0.000	0.000	$0	$0	$0
5					29.14	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
5					29.96	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
5					?	26.9	?	0.000	0.000	$0	$0	$0	25.0	?	0.000	0.000	$0	$0	$0
5					30.70	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
5					29.47	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
5					28.32	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
5					27.21	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
5					27.12	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
5					28.78	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
5					28.00	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
5					28.81	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
5					29.31	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
5					26.76	26.9	0.14	0.111	0.114	$10,730	$5,510	$16,241	25.0	0.00	0.000	0.000	$0	$0	$0
5					26.96	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
5					26.13	26.9	0.77	0.177	0.318	$13,280	$11,930	$25,210	25.0	0.00	0.000	0.000	$0	$0	$0
5					26.22	26.9	0.68	0.166	0.284	$11,404	$9,755	$21,160	25.0	0.00	0.000	0.000	$0	$0	$0
5					27.74	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
5					26.78	26.9	0.12	0.111	0.114	$10,058	$5,165	$15,222	25.0	0.00	0.000	0.000	$0	$0	$0
5					26.77	26.9	0.13	0.111	0.114	$10,733	$5,511	$16,244	25.0	0.00	0.000	0.000	$0	$0	$0
5					26.12	26.9	0.78	0.177	0.318	$10,806	$9,707	$20,513	25.0	0.00	0.000	0.000	$0	$0	$0
6					28.58	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
6					29.08	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
12					28.64	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
12					28.78	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
12					27.41	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
12					31.57	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
12					29.16	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
12					28.66	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
12					28.76	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
13					28.70	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
13					28.06	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
13					27.53	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
13					26.90	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
13					26.67	26.9	0.23	0.122	0.148	$8,893	$5,394	$14,286	25.0	0.00	0.000	0.000	$0	$0	$0
13					28.61	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
13					29.27	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
16					28.52	26.9	0.00	0.000	0.000	$0	$0	$0	25.0	0.00	0.000	0.000	$0	$0	$0
23					28.64	26.2	0.00	0.000	0.000	$0	$0	$0	26.2	0.00	0.000	0.000	$0	$0	$0
23					27.66	26.2	0.00	0.000	0.000	$0	$0	$0	26.2	0.00	0.000	0.000	$0	$0	$0
23					27.74	26.2	0.00	0.000	0.000	$0	$0	$0	26.2	0.00	0.000	0.000	$0	$0	$0
23					28.48	26.2	0.00	0.000	0.000	$0	$0	$0	26.2	0.00	0.000	0.000	$0	$0	$0
23					28.87	26.2	0.00	0.000	0.000	$0	$0	$0	26.2	0.00	0.000	0.000	$0	$0	$0
25					27.56	26.9	0.00	0.000	0.000	$0	$0	$0	26.9	0.00	0.000	0.000	$0	$0	$0
Total	46 residences		$3,276,320							$75,904	$52,972	$128,876					$0	$0	$0

Notes

1. Appraised values of structures (excluding land) per Hardin County Appraisal District.
2. Depth-damage factors per Galveston District, Corps of Engineers for Class 1 structures.
3. Value of structure contents estimated at 50% of structure value.

HARDIN COUNTY WCID
COMPUTATION OF EXPECTED FLOOD DAMAGE
LITTLE PINE ISLAND BAYOU 10-YEAR FLOOD
Job No. HD-002 July 12, 1989 File LPIB10.wk1 JNH

					Existing Conditions 10-Year Flood								Proposed Conditions 10-Year Flood (Coon Marsh Gully Improvements and Levee Improvements Along Clemmons Gully)						
								Depth-Damage Factor		Flood Damage					Depth-Damage Factor		Flood Damage		
Block	Lot	Street Address	Appraised Value of Structure	Owner	Slab Elevation (feet msl)	Flood Elevation (feet msl)	Depth of Flooding (feet)	Structure	Contents	Structure	Contents	Total	Flood Elevation (feet msl)	Depth of Flooding (feet)	Structure	Contents	Structure	Contents	Total
3					?	25.3	?	0.000	0.000	$0	$0	$0	25.3	?	0.000	0.000	$0	$0	$0
4					29.23	25.3	0.00	0.000	0.000	$0	$0	$0	25.3	0.00	0.000	0.000	$0	$0	$0
4					28.55	25.3	0.00	0.000	0.000	$0	$0	$0	25.3	0.00	0.000	0.000	$0	$0	$0
5					29.14	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
5					29.96	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
5					?	25.3	?	0.000	0.000	$0	$0	$0	24.5	?	0.000	0.000	$0	$0	$0
5					30.70	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
5					29.47	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
5					28.32	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
5					27.21	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
5					27.12	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
5					28.78	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
5					28.00	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
5					28.81	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
5					29.31	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
5					26.76	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
5					26.96	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
5					26.13	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
5					26.22	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
5					27.74	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
5					26.78	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
5					26.77	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
5					26.12	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
6					28.58	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
6					29.08	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
12					28.64	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
12					28.78	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
12					27.41	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
12					31.57	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
12					29.16	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
12					28.66	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
12					28.76	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
13					28.70	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
13					28.06	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
13					27.53	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
13					26.90	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
13					26.67	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
13					28.61	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
13					29.27	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
16					28.52	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
23					28.64	24.5	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
23					27.66	24.5	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
23					27.74	24.5	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
23					28.48	24.5	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
23					28.87	24.5	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
25					27.56	25.3	0.00	0.000	0.000	$0	$0	$0	24.5	0.00	0.000	0.000	$0	$0	$0
Total	46 residences		$3,276,320							$0	$0	$0					$0	$0	$0

Notes
1. Appraised values of structures (excluding land) per Hardin County Appraisal District.
2. Depth-damage factors per Galveston District, Corps of Engineers for Class 1 structures.
3. Value of structure contents estimated at 50% of structure value.

APPENDIX 8

AVERAGE ANNUAL FLOOD DAMAGE - COON MARSH GULLY CHANNEL IMPROVEMENTS WITH LEVEE IMPROVEMENTS ALONG CLEMMONS GULLY

HARDIN COUNTY WCID NO. 1

COMPUTATION OF AVERAGE ANNUAL FLOOD DAMAGE

COON MARSH GULLY CHANNEL IMPROVEMENTS
WITH LEVEE IMPROVEMENTS ALONG CLEMMONS GULLY

Job No. HD-002 File AAFD2.wk1 JNH

July 17, 1989

Flood Exceedance Probability	Existing Conditions Flood Damage	Proposed Conditions Flood Damage
0.01	$1,410,123	$118,728
0.02	$799,580	$28,013
0.04	$359,943	$0
0.10	$187,079	$0
0.20	$159,672	$0
0.50	$38,547	$0

(1) Flood Exceedance Probability	(2) Existing Conditions Flood Damage	(3) (2)*.01	(4) Proposed Conditions Flood Damage	(5) (4)*.01
0.01	$1,410,123	$14,101	$118,728	$1,187
0.02	$799,580	$7,996	$28,013	$280
0.03	$579,762	$5,798	$14,007	$140
0.04	$359,943	$3,599	$0	$0
0.05	$331,132	$3,311	$0	$0
0.06	$302,322	$3,023	$0	$0
0.07	$273,511	$2,735	$0	$0
0.08	$244,700	$2,447	$0	$0
0.09	$215,890	$2,159	$0	$0
0.10	$187,079	$1,871	$0	$0
0.11	$184,338	$1,843	$0	$0
0.12	$181,598	$1,816	$0	$0
0.13	$178,857	$1,789	$0	$0
0.14	$176,116	$1,761	$0	$0
0.15	$173,375	$1,734	$0	$0
0.16	$170,635	$1,706	$0	$0
0.17	$167,894	$1,679	$0	$0
0.18	$165,153	$1,652	$0	$0
0.19	$162,413	$1,624	$0	$0
0.20	$159,672	$1,597	$0	$0
0.21	$155,635	$1,556	$0	$0
0.22	$151,597	$1,516	$0	$0
0.23	$147,560	$1,476	$0	$0
0.24	$143,522	$1,435	$0	$0
0.25	$139,485	$1,395	$0	$0
0.26	$135,447	$1,354	$0	$0

0.27	$131,410	$1,314	$0	$0
0.28	$127,372	$1,274	$0	$0
0.29	$123,335	$1,233	$0	$0
0.30	$119,297	$1,193	$0	$0
0.31	$115,260	$1,153	$0	$0
0.32	$111,222	$1,112	$0	$0
0.33	$107,185	$1,072	$0	$0
0.34	$103,147	$1,031	$0	$0
0.35	$99,110	$991	$0	$0
0.36	$95,072	$951	$0	$0
0.37	$91,035	$910	$0	$0
0.38	$86,997	$870	$0	$0
0.39	$82,960	$830	$0	$0
0.40	$78,922	$789	$0	$0
0.41	$74,885	$749	$0	$0
0.42	$70,847	$708	$0	$0
0.43	$66,810	$668	$0	$0
0.44	$62,772	$628	$0	$0
0.45	$58,735	$587	$0	$0
0.46	$54,697	$547	$0	$0
0.47	$50,660	$507	$0	$0
0.48	$46,622	$466	$0	$0
0.49	$42,585	$426	$0	$0
0.50	$38,547	$385	$0	$0

Average Annual Flood Damage (Coon Marsh Gully Channel Improvements with Levee Improvements along Clemmons Gully) $93,368 $1,607

Reduction in Average Annual Flood Damage = $91,761

APPENDIX 9

AVERAGE ANNUAL FLOOD DAMAGE - COON MARSH GULLY CHANNEL IMPROVEMENTS WITHOUT LEVEE IMPROVEMENTS ALONG CLEMMONS GULLY

HARDIN COUNTY WCID NO. 1

COMPUTATION OF AVERAGE ANNUAL FLOOD DAMAGE

COON MARSH GULLY CHANNEL IMPROVEMENTS
WITHOUT LEVEE IMPROVEMENTS ALONG CLEMMONS GULLY

Job No. HD-002 File AAFD1.wk1 JNH

July 17, 1989

Flood Exceedance Probability	Existing Conditions Flood Damage	Proposed Conditions Flood Damage
0.01	$299,166	$32,836
0.02	$263,375	$12,785
0.04	$231,067	$0
0.10	$187,079	$0
0.20	$159,672	$0
0.50	$38,547	$0

(1) Flood Exceedance Probability	(2) Existing Conditions Flood Damage	(3) (2)*.01	(4) Proposed Conditions Flood Damage	(5) (4)*.01
0.01	$299,166	$2,992	$32,836	$328
0.02	$263,375	$2,634	$12,785	$128
0.03	$247,221	$2,472	$6,393	$64
0.04	$231,067	$2,311	$0	$0
0.05	$223,736	$2,237	$0	$0
0.06	$216,404	$2,164	$0	$0
0.07	$209,073	$2,091	$0	$0
0.08	$201,742	$2,017	$0	$0
0.09	$194,410	$1,944	$0	$0
0.10	$187,079	$1,871	$0	$0
0.11	$184,338	$1,843	$0	$0
0.12	$181,598	$1,816	$0	$0
0.13	$178,857	$1,789	$0	$0
0.14	$176,116	$1,761	$0	$0
0.15	$173,375	$1,734	$0	$0
0.16	$170,635	$1,706	$0	$0
0.17	$167,894	$1,679	$0	$0
0.18	$165,153	$1,652	$0	$0
0.19	$162,413	$1,624	$0	$0
0.20	$159,672	$1,597	$0	$0
0.21	$155,635	$1,556	$0	$0
0.22	$151,597	$1,516	$0	$0
0.23	$147,560	$1,476	$0	$0
0.24	$143,522	$1,435	$0	$0
0.25	$139,485	$1,395	$0	$0
0.26	$135,447	$1,354	$0	$0

0.27	$131,410	$1,314	$0	$0
0.28	$127,372	$1,274	$0	$0
0.29	$123,335	$1,233	$0	$0
0.30	$119,297	$1,193	$0	$0
0.31	$115,260	$1,153	$0	$0
0.32	$111,222	$1,112	$0	$0
0.33	$107,185	$1,072	$0	$0
0.34	$103,147	$1,031	$0	$0
0.35	$99,110	$991	$0	$0
0.36	$95,072	$951	$0	$0
0.37	$91,035	$910	$0	$0
0.38	$86,997	$870	$0	$0
0.39	$82,960	$830	$0	$0
0.40	$78,922	$789	$0	$0
0.41	$74,885	$749	$0	$0
0.42	$70,847	$708	$0	$0
0.43	$66,810	$668	$0	$0
0.44	$62,772	$628	$0	$0
0.45	$58,735	$587	$0	$0
0.46	$54,697	$547	$0	$0
0.47	$50,660	$507	$0	$0
0.48	$46,622	$466	$0	$0
0.49	$42,585	$426	$0	$0
0.50	$38,547	$385	$0	$0

Average Annual Flood Damage $69,060 $520
(Coon Marsh Gully Channel Improvements
without Levee Improvements along Clemmons Gully)

Reduction in Average Annual Flood Damage = $68,540