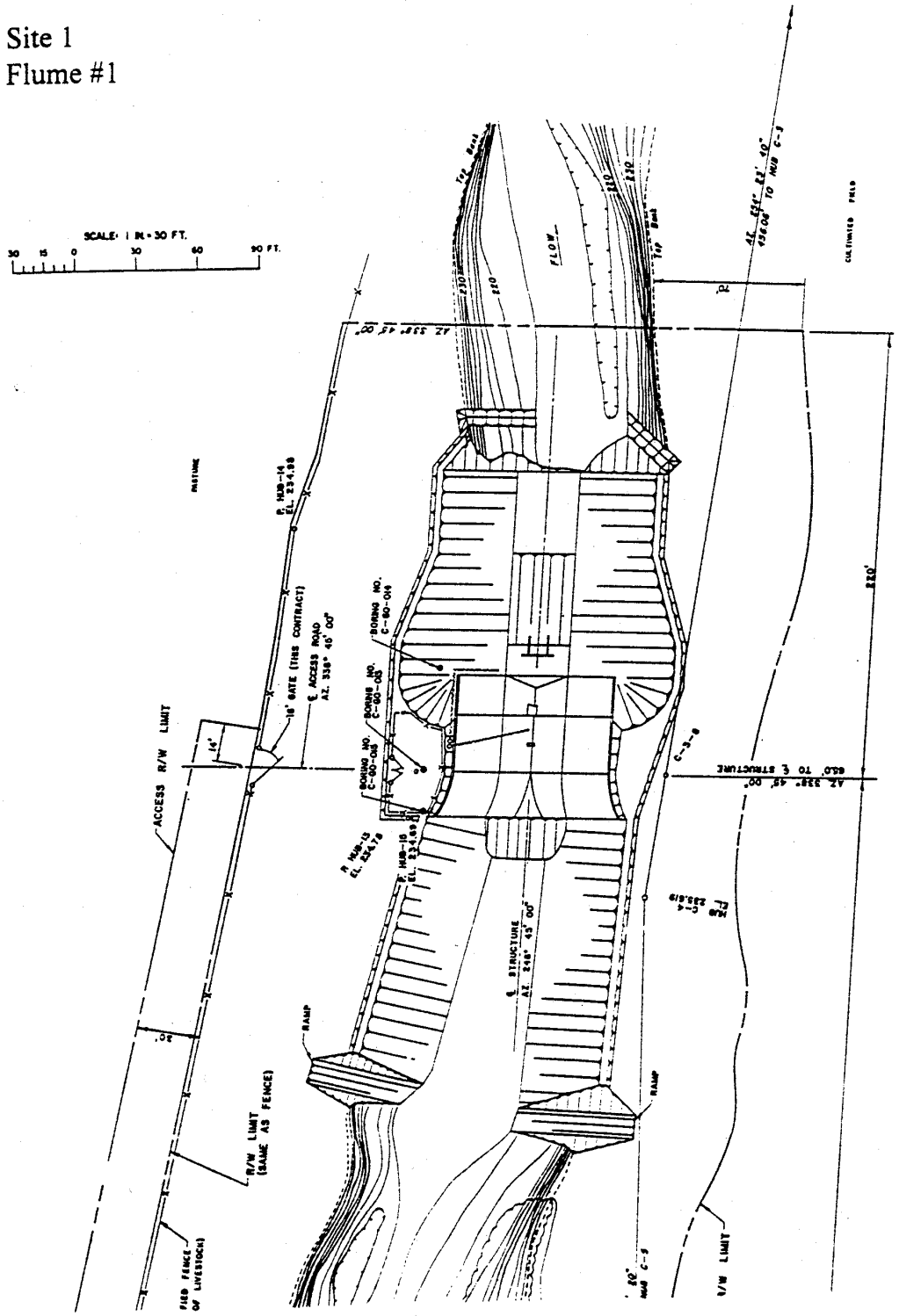
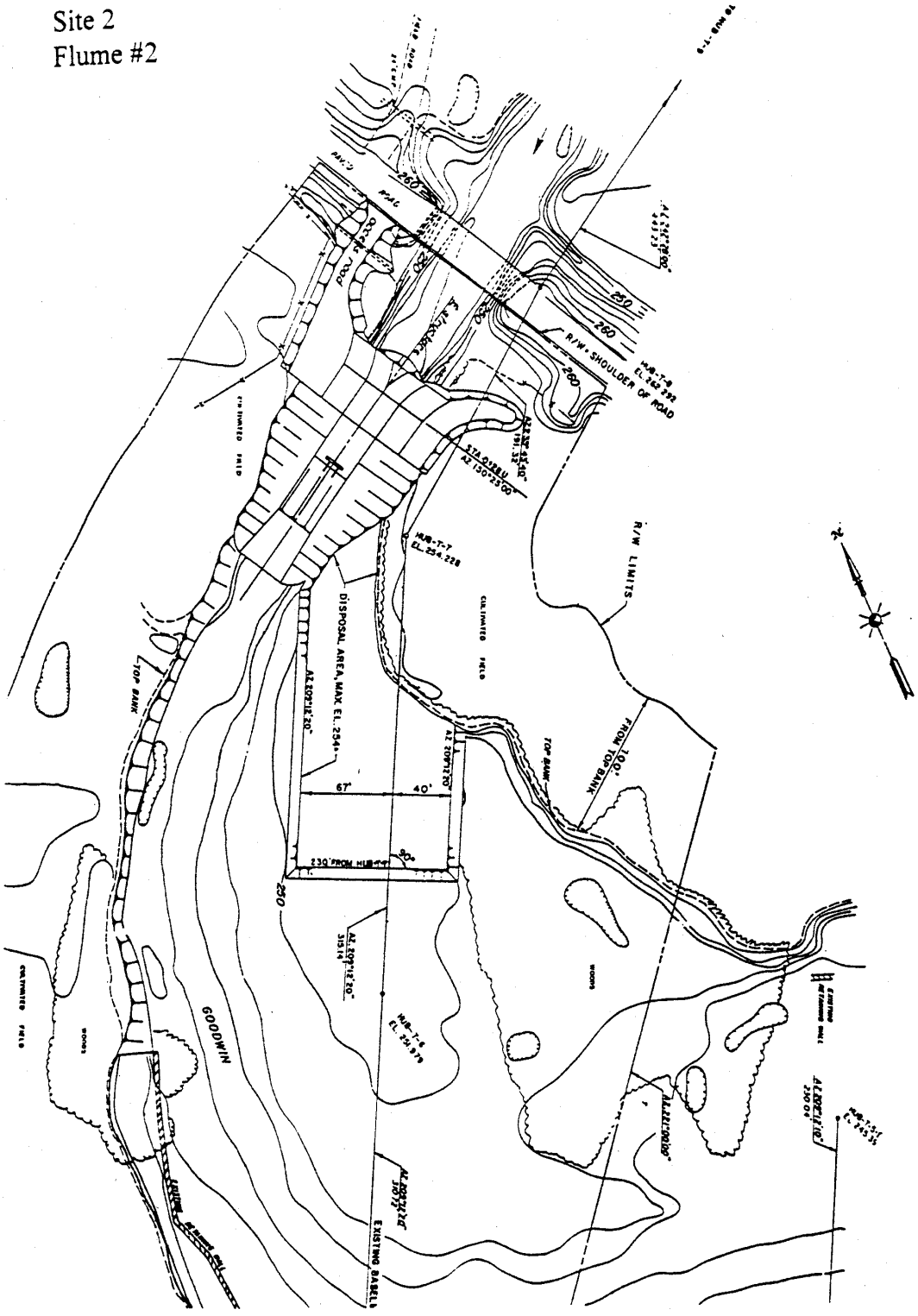
APPENDIX A

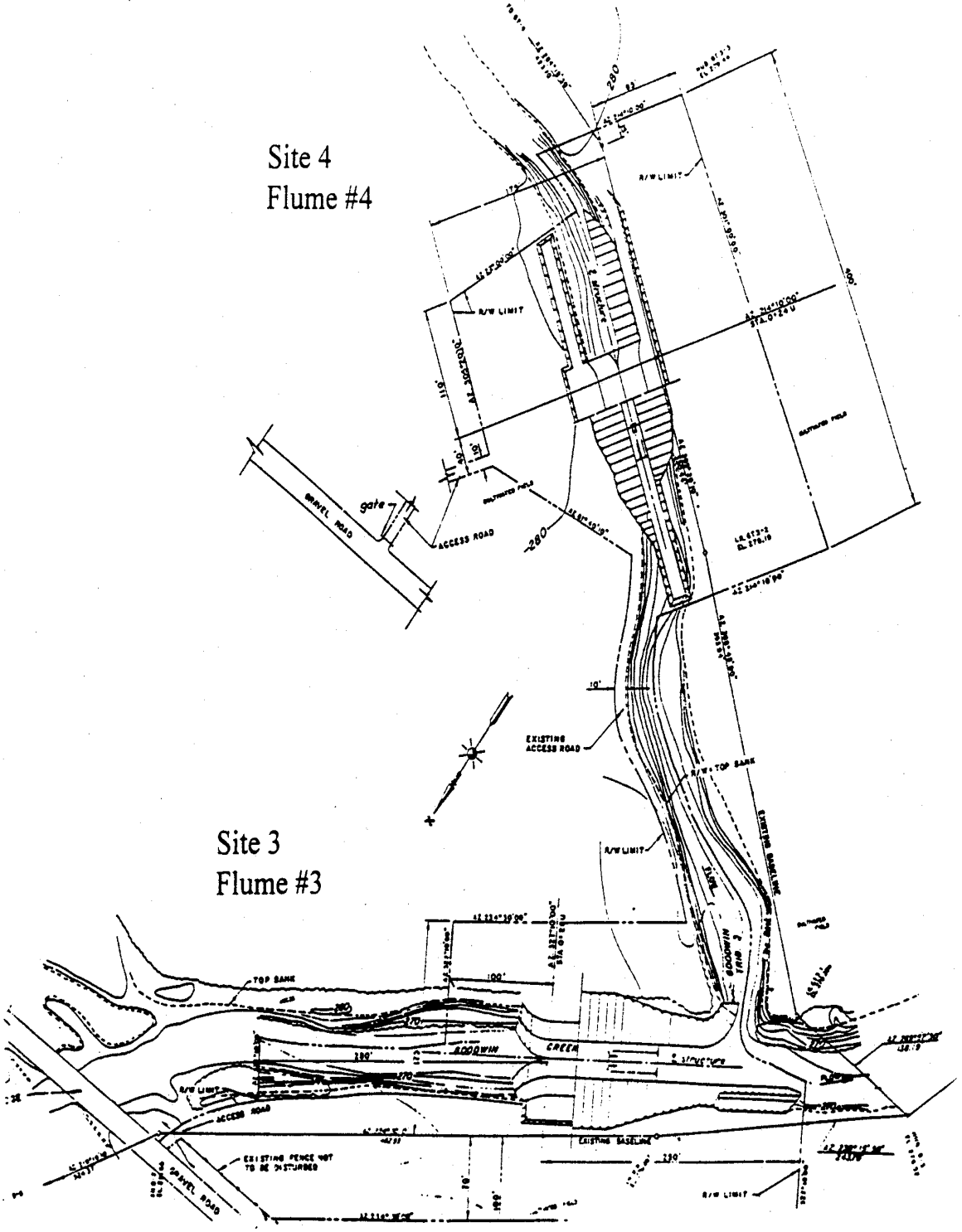
Plan View of Flume Position in Relation to Stream Alignment at Flow Measuring Sites

Site 1
Flume #1

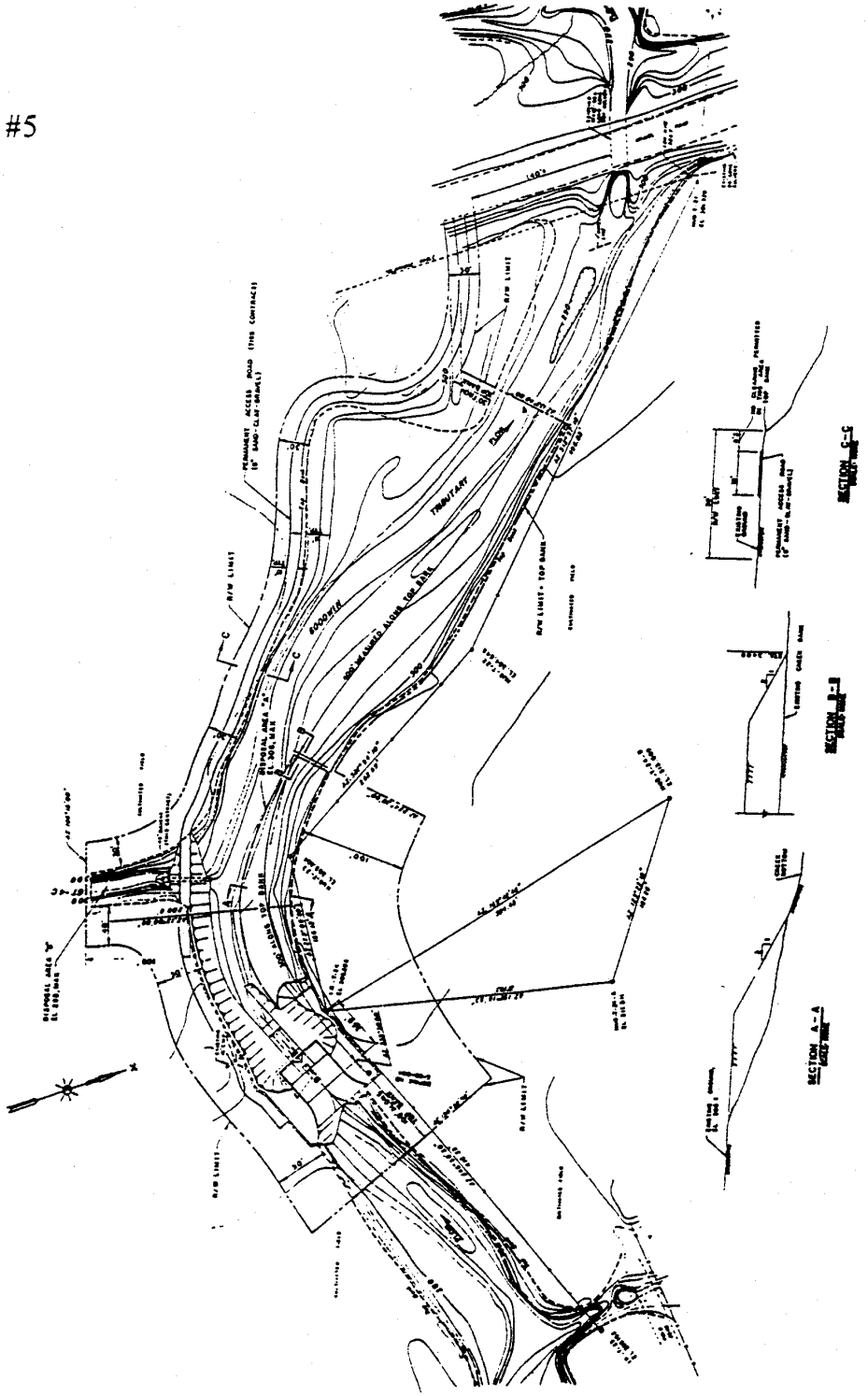


Site 2
Flume #2

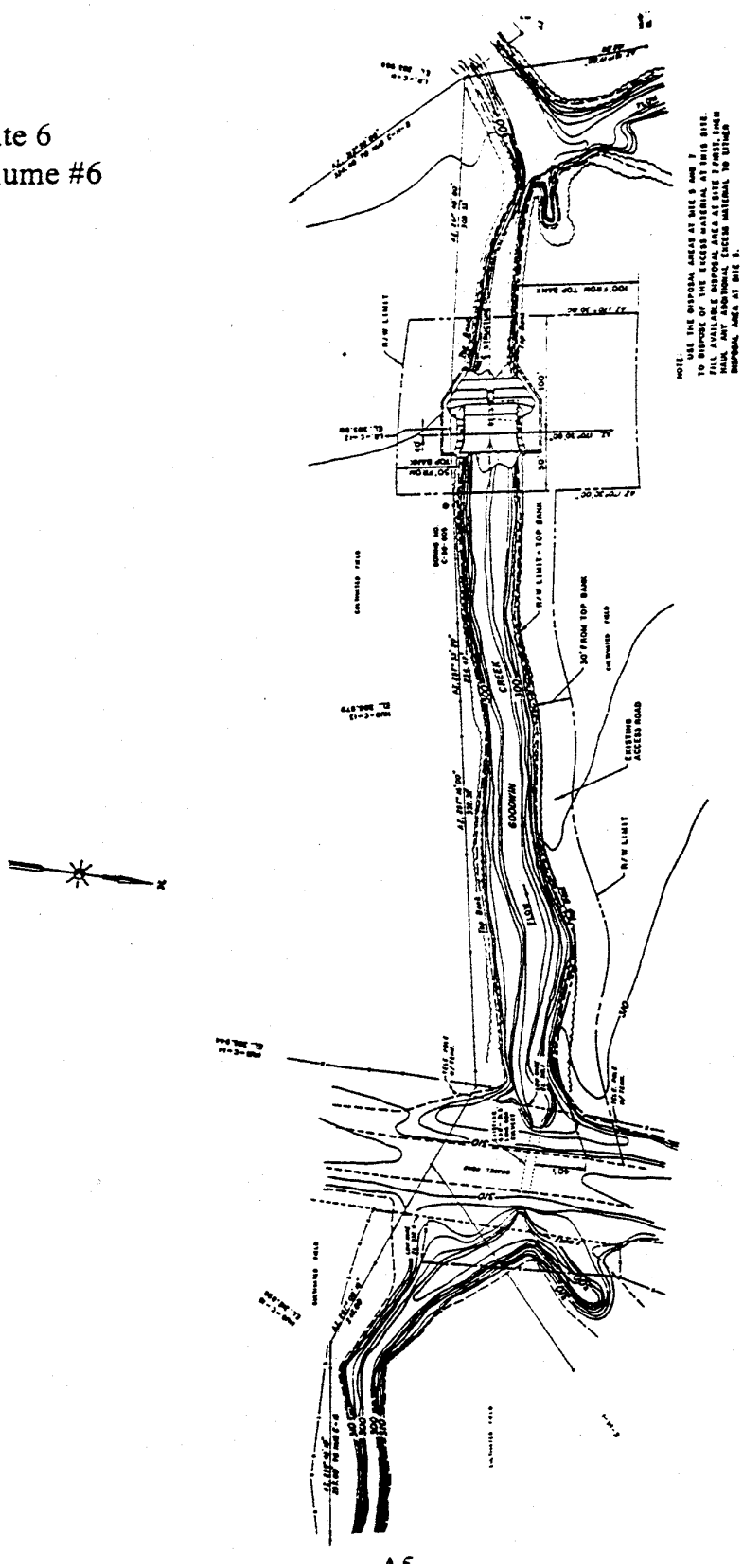



Site 4
Flume #4
Site 3
Flume #3
GRAVEL ROAD
gate
ACCESS ROAD
EXISTING ACCESS ROAD
R/W LIMIT
R/W TOP BANK
EXISTING BASELINE
TOP BANK
BOOBWIN CREEK
EXISTING FENCE NOT TO BE DISTURBED

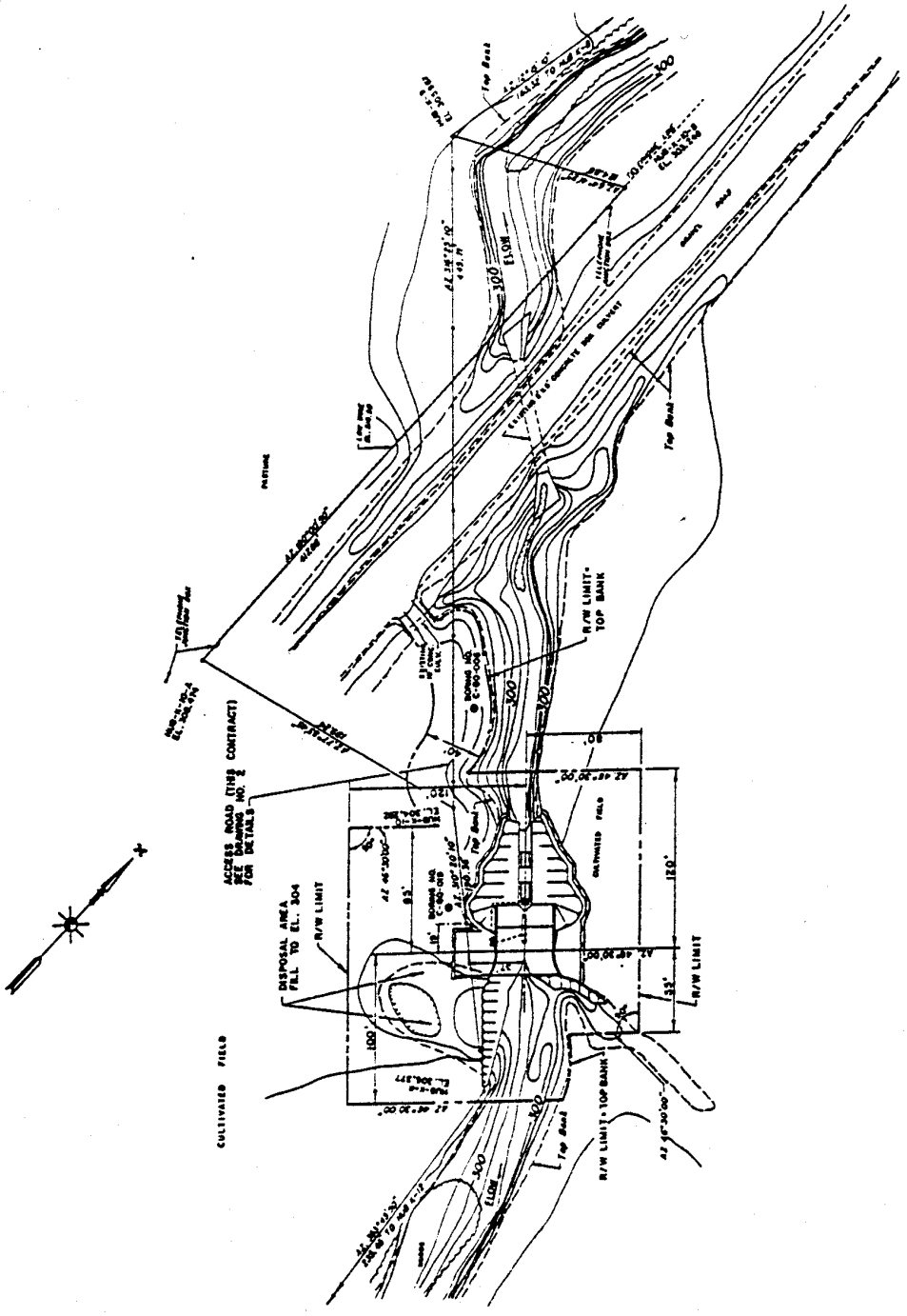
Site 5
Flume #5

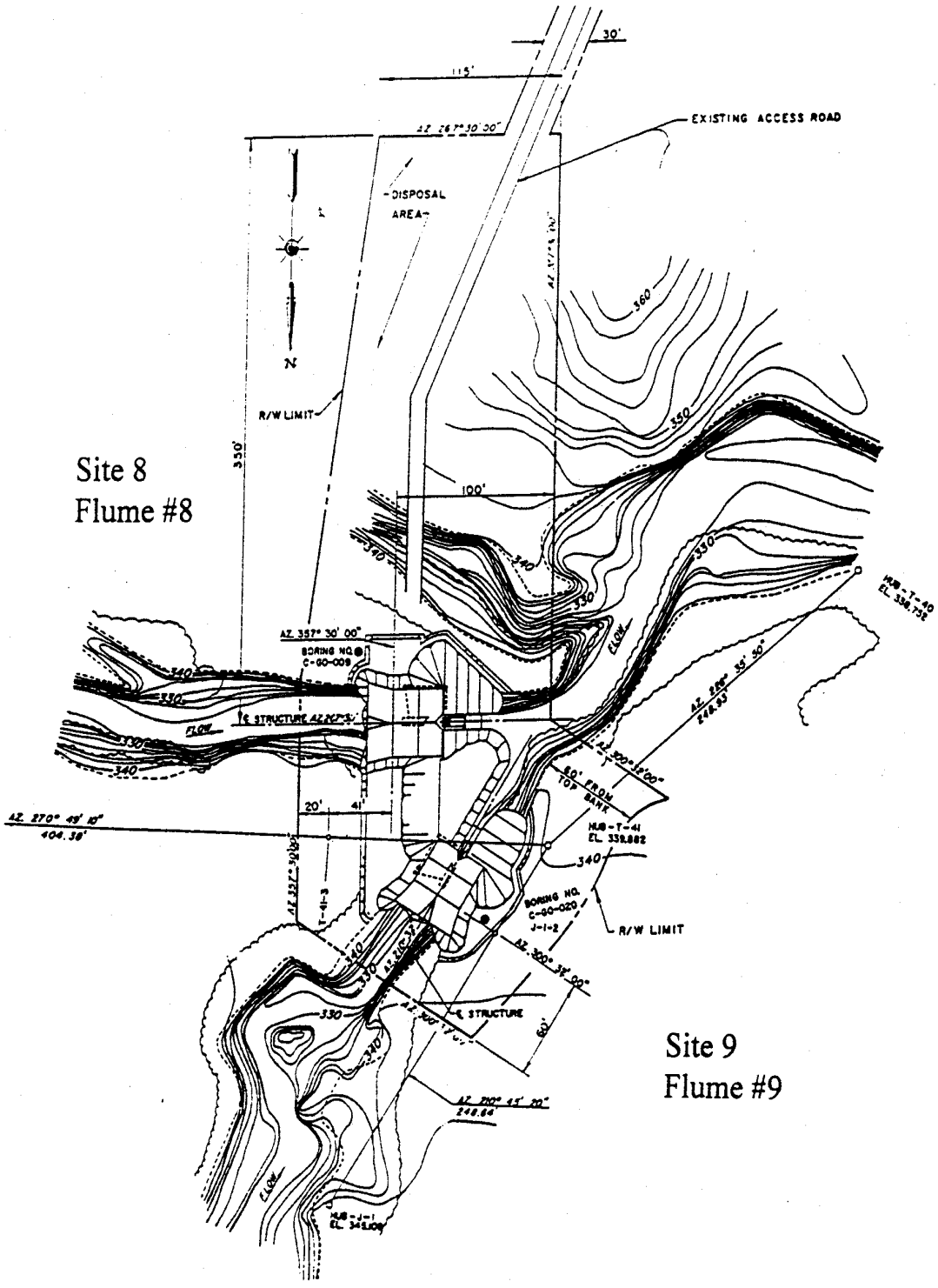


Site 6
Flume #6

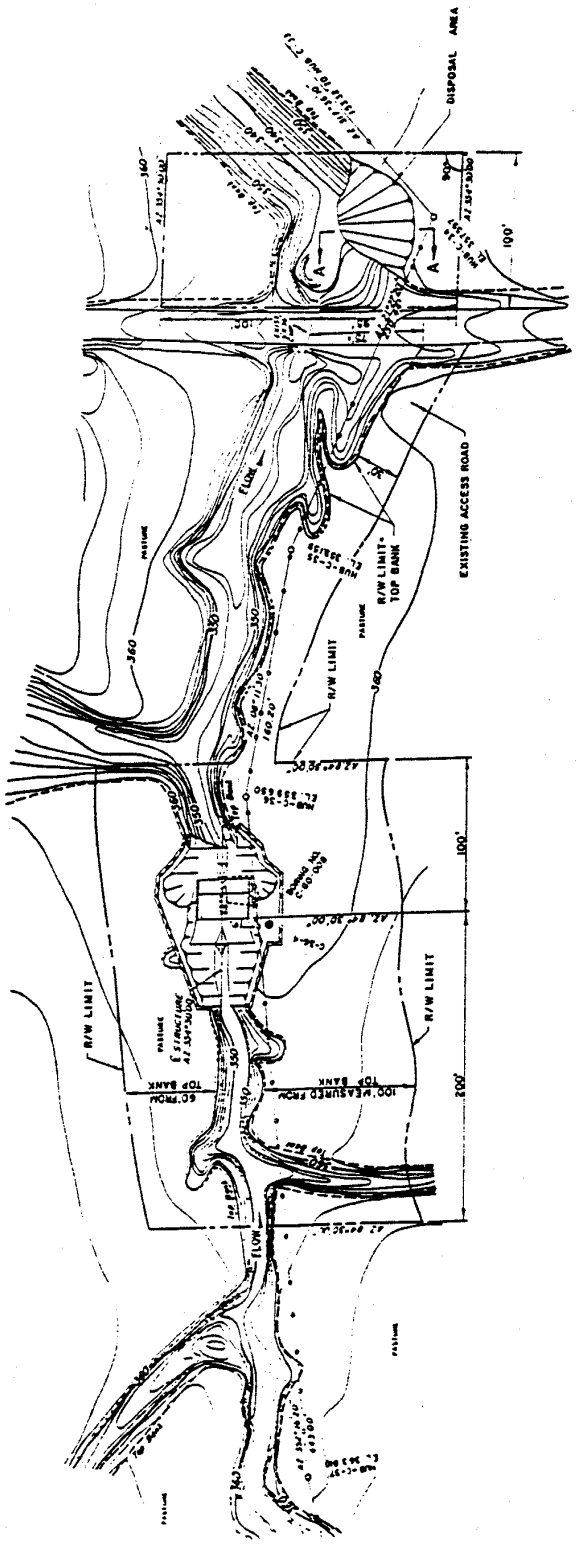


Site 7
Flume #7

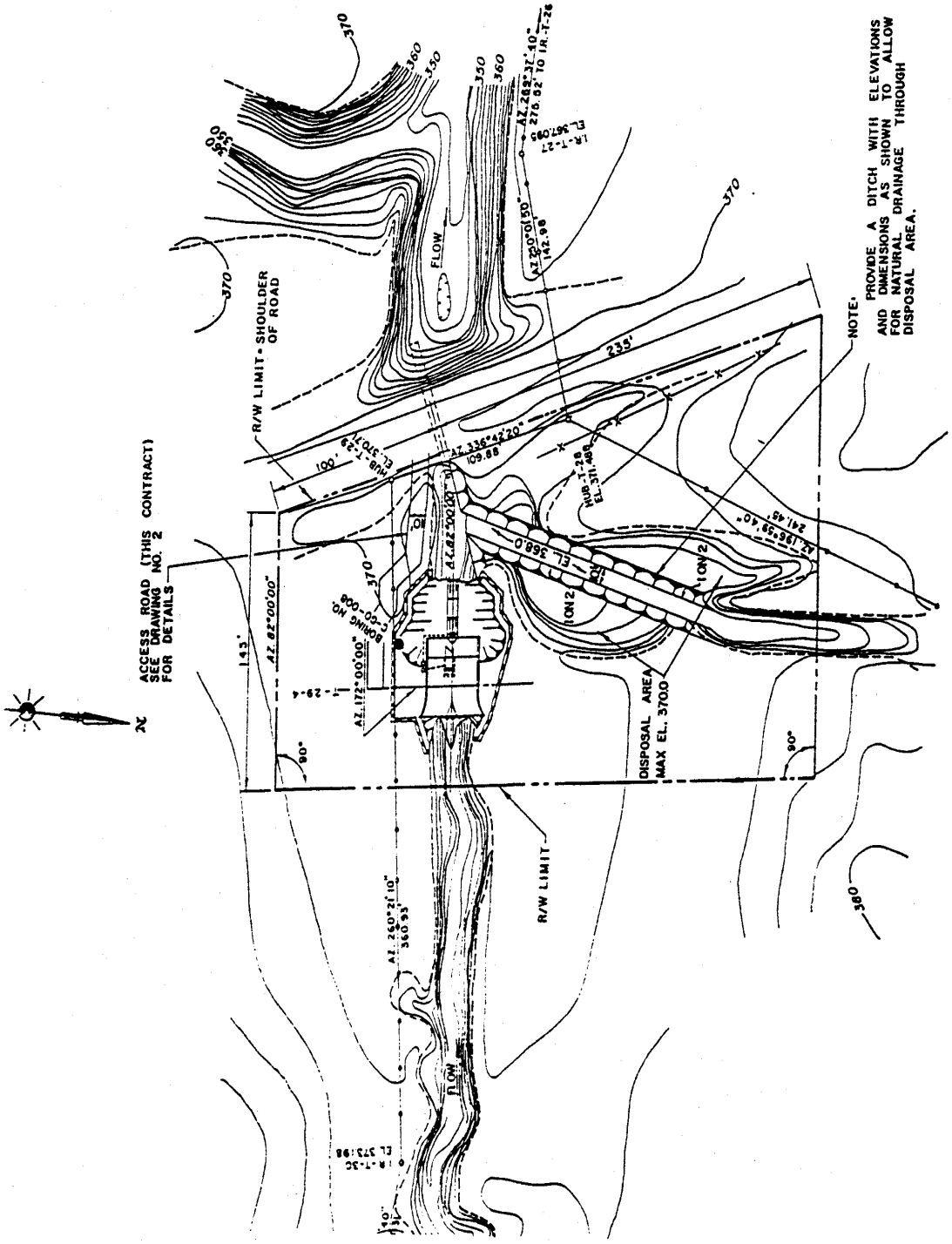



Site 8
Flume #8
Site 9
Flume #9
EXISTING ACCESS ROAD
DISPOSAL AREA
R/W LIMIT
R/W LIMIT
N
30'
115'
100'
350'
20'
41'
60' FROM TOP BANK
60'
BORING NO. C-60-009
BORING NO. C-60-020
J-1-2
T-41-3
HUB-T-40
EL. 358.75E
HUB-T-41
EL. 352.88E
HUB-J-1
EL. 345.10N
FLOW
FLOW
AZ. 357° 30' 00"
AZ. 270° 49' 10"
404.38'
AZ. 300° 35' 50"
248.43'
AZ. 300° 31' 00"
AZ. 210° 45' 00"
248.64'
℄ STRUCTURE
℄ STRUCTURE
340
350
360

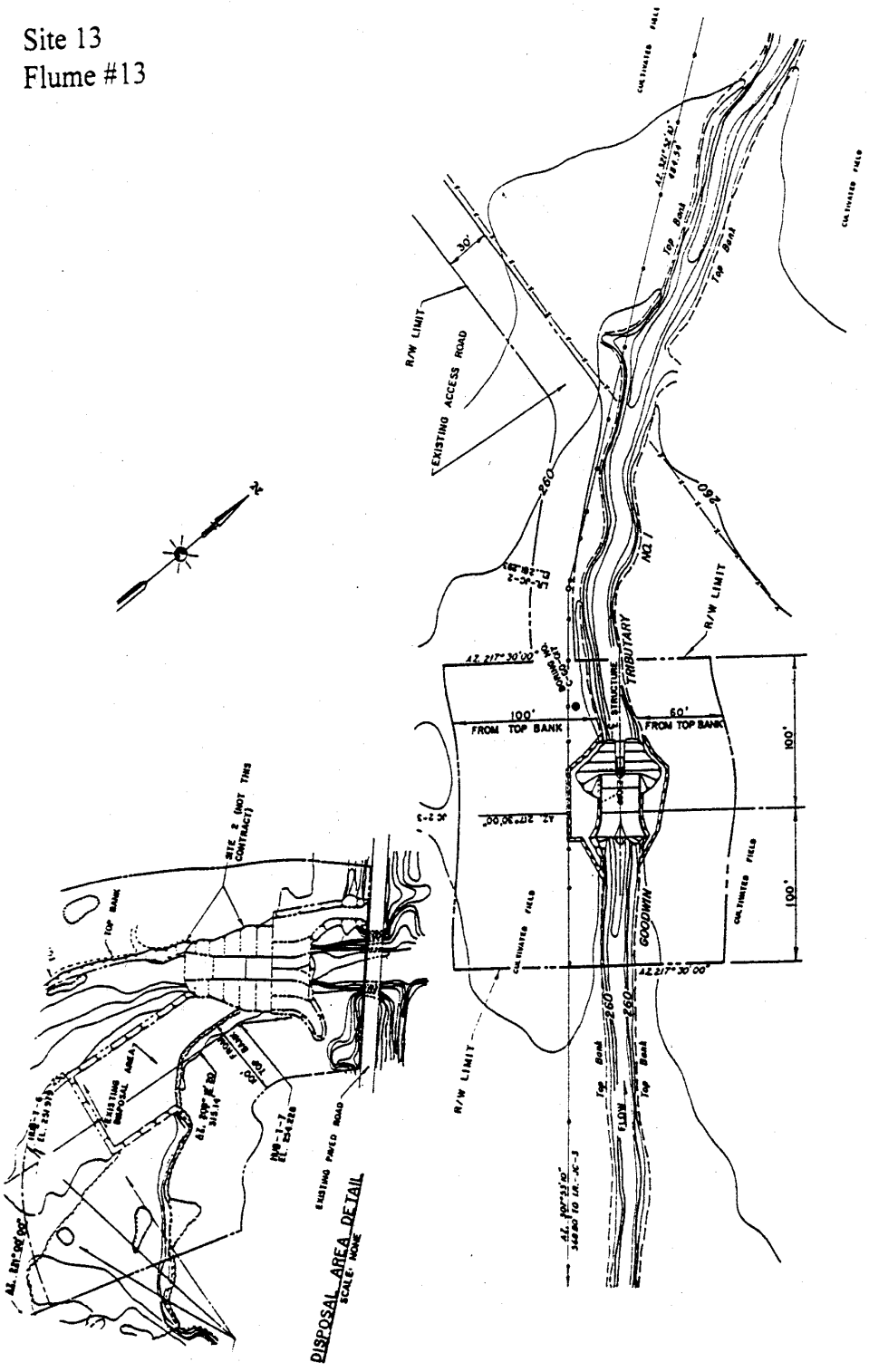
Site 11
Flume #11



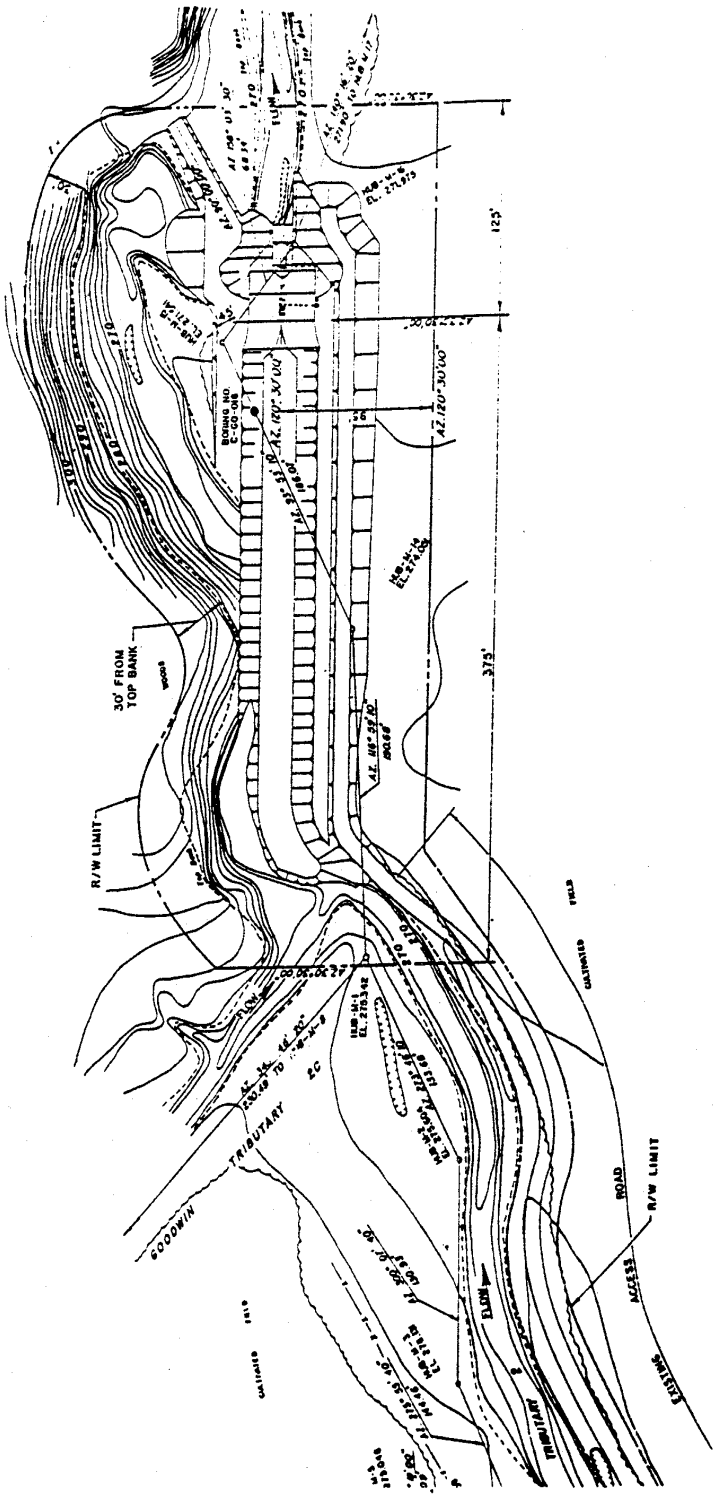
Site 12
Flume #12



Site 13
Flume #13



Site 14
Flume #14



APPENDIX B

Information for SURFRAD Users

APPENDIX B - Information for SURFRAD Users

B.1 Basic Radiation Information

Any object warmer than absolute zero emits radiation, and the intensity and characteristic wavelength of the emitted radiation depends on its temperature. Radiative intensity increases, and the dominant wavelength decreases, with increasing temperature of the emitting surface. Owing to this relationship, the distribution of wavelengths (or spectrum) emitted by the sun, and that of the earth/atmosphere system are virtually distinct. Nearly all of the sun's radiant energy is in the waveband encompassing the ultraviolet, visible, and near infrared (280 to 2800 nm), or short wavelengths; and emissions from the earth and atmosphere are confined to longer wavelengths in the thermal infrared (4000 and 100000 nm). These wavebands represent the primary energy sources and sinks of the earth-atmosphere system.

The solar irradiance intercepted by the earth at the top of the atmosphere, the solar constant, is quite stable with an observed value of 1376 Watts/m2 ± 0.3%. However, in the mean, only about half of this energy reaches the surface and is available to drive surface and biological processes. Of the other half, approximately 30% is reflected back to space, and the remaining 20% is absorbed by clouds, dust, and "greenhouse" gasses such as water vapor, carbon dioxide, and ozone. Solar radiation reaching the surface is made up of two components, direct and diffuse. Direct radiation is that which travels unimpeded through space and the atmosphere to the surface; and diffuse radiation is that scattered by atmospheric constituents such as molecules, aerosols, and clouds. In simple terms, direct radiation causes shadows, and diffuse is responsible for sky light. The sum of the direct and diffuse components reaching a horizontal surface is global radiation.

In moist, cloudy regions, much of the thermal infrared radiation emitted by the surface of the earth is absorbed by clouds and water vapor. Under the clouds, a large fraction of the absorbed radiation is re-emitted back to the surface, keeping it relatively warm. However, a significant amount of thermal energy is lost to space from upward emissions by cloud tops, greenhouse gasses, and from the surface in dry, cloud-free regions. Thus thermal emission is responsible for a net loss of energy from the earth and atmosphere. Because of the earth's rotation, curvature, variable cloud cover, and other factors, the contributions of solar and thermal infrared radiation to the earth's energy budget varies greatly over the globe, and over annual and diurnal cycles. Though, in the mean, over long periods, the earth/atmosphere system is in net radiative balance. Also the general circulation of the earth and weather systems act to counter imbalances created by differential radiative input by net transport of equatorial heat poleward and polar cold equatorward. Owing to this equilibrium, the earth maintains a nearly constant mean temperature, greater than what would be experienced if there were no atmosphere, and

it is that which creates an hospitable environment for life.

B.2 Function of the SURFRAD Instruments

The basic function of a radiometer is to convert radiant energy to another form of energy (e. g., thermal, electrical) that can be measured. Instruments that measure solar and thermal infrared broadband radiation generally use thermal detectors, whereas the "spectral" instruments (MFRSR, UVB meter, and PAR) use photoelectric detectors. Descriptions and specifications of the radiometers used for SURFRAD are given below:

B.2.1 Normal Incidence Pyrheliometer (NIP)

The pyrheliometer is a broadband instrument that measures the direct (or beam) component of solar radiation at normal incidence, i. e., it always is aimed directly at the sun. It is sensitive to wavelengths in the band from 280 to 3000 nm. To achieve normal incidence to the sun, the NIP is mounted on an Epply equatorial solar "smart" tracker that continuously trains the instrument on the sun. After sunset the tracker resets to the sunrise position. The aperture of the NIP is small enough to minimize the registration of circumsolar radiation but large enough to allow for the performance tolerance of the tracker. Solar irradiance enters the instrument through a crystal-quartz window that is sealed to the aperture. Within the instrument, the irradiance is directed onto a 3/8" square black mylar receiver on which a set of thermocouples (a thermopile) is cemented. The radiation warms the detector and excites the thermopile, which produces an electrical signal. A calibration factor is applied to convert the millivolt signal to an equivalent radiant energy flux in Watts/m2.

B.2.2 Precision Spectral Photometer (PSP)

The PSP, or pyranometer, measures global solar irradiance in the same spectral range as the NIP (280 to 3000 nm). The detector is made up of a circular multijunction thermopile attached to a black mylar disk, which sits horizontally beneath two quartz-glass domes. The inner dome protects the detector from infrared radiation from the outer dome, which may change rapidly with meteorological conditions. The detector is heated by solar energy and the thermopile reacts to the heating by generating a small electrical signal. A calibration factor converts the millivolt signal to an equivalent radiant energy flux in Watts/m2. At each SURFRAD site there are two PSPs, one facing upward to measure downwelling global solar radiation, and another is mounted near the top of a 10-meter tower viewing downward to measure upwelling solar radiation, i. e., that reflected from the surface. The pyranometer on the platform is mounted on a ventilator that circulates ambient air over the outer quartz dome to reduce frost, dew, and snow accumulation. The PSP on the tower is shielded from the sun by a shallow aluminum cylinder painted white.

B.2.3 Precision Infrared Radiometer (PIR)

The PIR, or pyrgeometer, measures global thermal infrared irradiance. It is sensitive to wavelengths in the range from 3000 to 50000 nm, which covers the span of temperatures (or thermal radiation) expected from the earth and atmosphere. The pyrgeometer works on the same principle as the pyranometer in that radiant energy is converted to heat energy which, in turn, is measured by a thermopile. However, protecting the sensor from the environment (e. g., solar radiation) is difficult. To do this, the dome is made of silicon, which is nearly opaque to solar wavelengths. The dome is also coated with a grayish interference filter that does not transmit wavelengths shorter than 3000 nm, but sharply increases to 50% transmission at 4000 nm. From 4000 to 50000 nm its transmittance slowly falls to about 30-40%.

The detector senses a net signal from a number of sources which includes emissions from targets in its field of view, emission from the case of the instrument, and emission from the dome. To resurrect the true environmental thermal infrared irradiance, temperatures of the detector, case, and dome are monitored with thermistors. Because the case is shielded from the sun, its temperature represents the air temperature and therefore is a proxy for the degree of thermal emission by the atmosphere. The dome, however, is not protected from solar heating. Therefore, the difference between the thermal emissions of the case and dome represents an erroneous signal that must be removed. (As mentioned before, shading the dome would make this error negligible.) An empirical calibration equation accounts for all of these effects and converts the three measured temperatures to a true environmental thermal infrared irradiance in Watts m-2.

There are two pyrgeometers at SURFRAD stations, one on the platform that faces upward and one on the tower that views the surface. Like the pyranometers, the up-facing pyrgeometer is ventilated to protect the dome from the elements and reduce the effect of solar heating, and the pyrgeometer mounted on the tower is protected by a white aluminum sunshield.

B.2.4 UVB Photometer

The UVB photometer deployed at SURFRAD sites measures global solar ultraviolet irradiance between 290 and 315 nm, peaking in response at about 300 nm. This covers the part of the solar spectrum that is responsible for sunburns on human skin. The protective dome over the receiving surface is made of a special glass that transmits visible and UV wavelengths. A feature that differentiates this instrument from the solar pyranometer is that the receiving surface beneath the dome is not the detector. Rather, it is a UV-transmitting black filter that screens out visible wavelengths--except for a small bit of red light. Beneath this filter, the transmitted energy cascades through a layer of

UVB-sensitive phosphor, where it is absorbed and reemitted as visible light (primarily green). The visible light then passes through a green filter, below which its intensity is measured by a photodiode detector. The UVB meter is thermally stabilized at 45iC to maintain all components at a nearly constant operating temperature, and to keep the body of the instrument free of moisture, snow, and frost.

B.2.5 Photosynthetically Active Radiation (PAR) Sensor

The PAR sensor measures global solar radiation from 400 to 700 nm, which approximates the spectral band active in photosynthesis. The response of the instrument falls sharply to zero on either side of this band, and between 400 and 670 nm it increases monotonically from about 50% to 100%. There is no protective glass dome over the receiving surface. Irradiance from the sun passes through a small white visible bandpass filter/diffuser in the shape of a horizontal disk at the top of the instrument. Within the instrument radiation is directed through a series of colored glass filters and onto a silicon photodiode detector. The factory-supplied calibration converts the signal from the detector to a flux of photons in mmole (of photons) s-1 m-2. (One mmole equals 6.022 x 1017photons.) For the solar spectrum, these units may be converted to Watts m-2 by dividing by 4.6.

B.2.6 Multi-Filter Rotating Shadowband Radiometer (MFRSR)

The MFRSR is the most complex instrument in the SURFRAD suite, and new enough to be considered experimental. It measures both global and diffuse radiation in six narrow bands, approximately 10 nm wide, centered on 415, 500, 615, 673, 870, and 940 nm. The first four channels are in the visible and last two are in the near infrared part of the solar spectrum. These particular bands were selected to allow for the computation of optical depths for aerosols, water vapor and ozone. The MFRSR also has one silicon broadband detector for measuring total solar irradiance. The receiving surface is a small unprotected horizontal diffuser disk covering the aperture atop of a cylindrical, temperature-controlled enclosure. Within this enclosure selective waveband sampling is accomplished by interference filters, and photodetectors beneath the filters measure the signal strengths. However, presently, these signals can not be converted to an equivalent radiant energy flux because calibration factors have not been supplied by the manufacturer. Nevertheless, this deficiency does not affect optical depth calculations made using the Langley slope method[1]; which circumvents the need for absolute

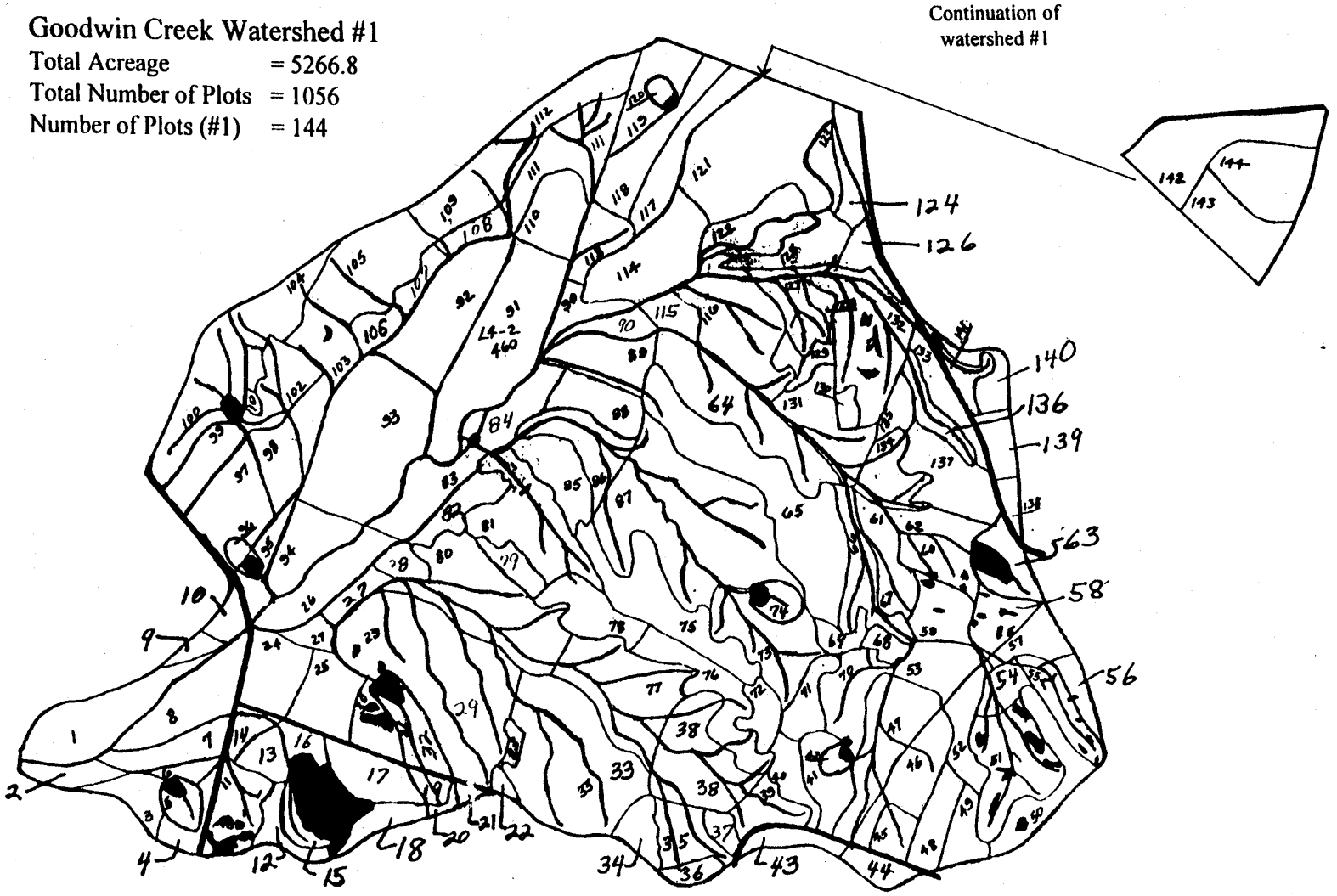
[1] In applying the Langley slope method to compute optical depth, the log of the output signals (voltages) of several measurements of monochromatic radiation taken throughout the day are plotted against the secant of the solar zenith angle (or the airmass). The slope of the resultant line is the mean optical depth.

calibrations. The ability to obtain both global and diffuse measurements is made possible by the rotating curved metal strip (the shadowband). While the band is at rest, below the receiving enclosure, the instrument measures downwelling global radiation. Periodically (four times per minute at most), the curved band swings over the top and shades the aperture, restricting the measured solar radiation to the diffuse component. Measurements are made every 15 seconds and one-minute averages are recorded. The MFRSR is heated to keep its components at a constant temperature, and to keep it free of snow and ice.

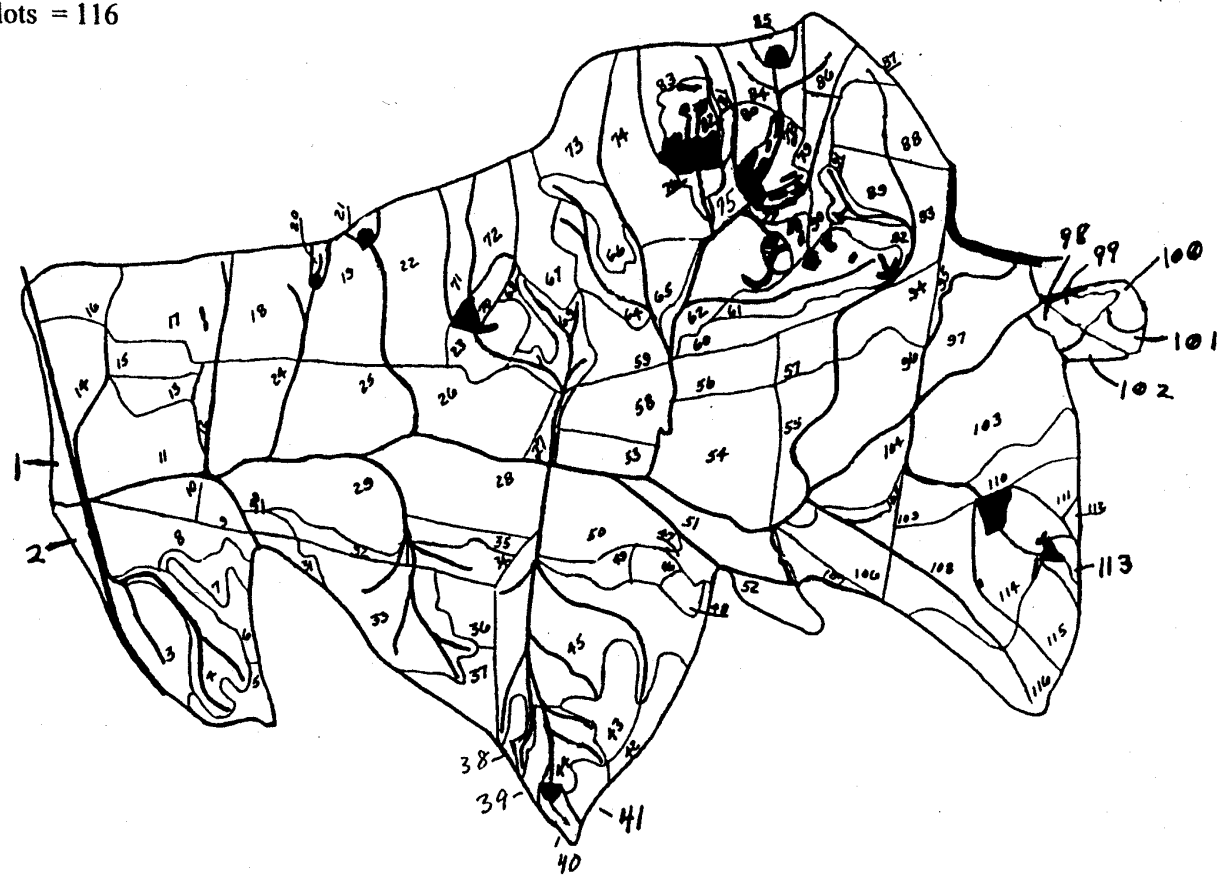
APPENDIX C

Goodwin Creek Subwatershed Field Numbers
Used for Land Use Surveys

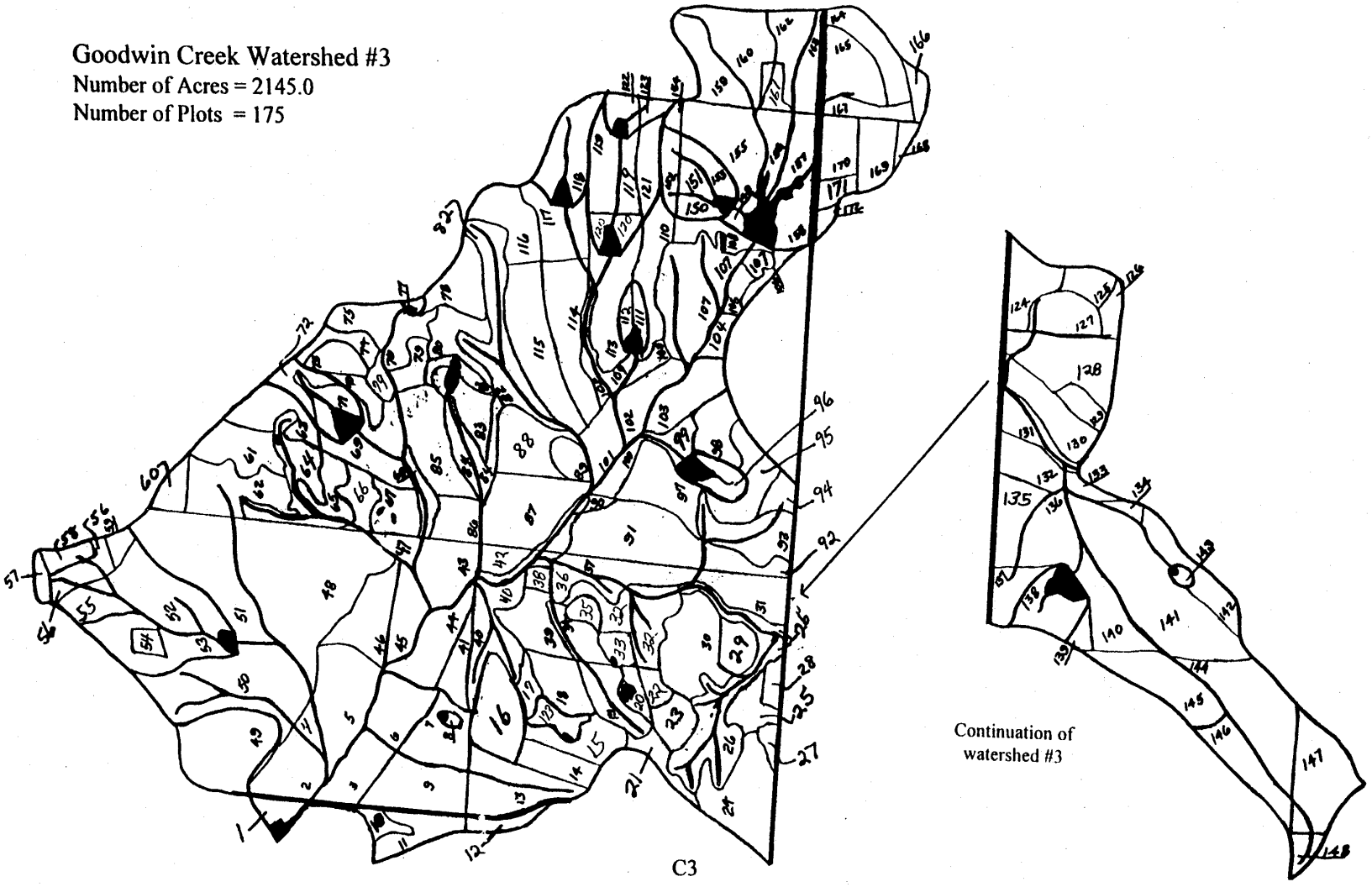
Goodwin Creek Watershed #1
Total Acreage = 5266.8
Total Number of Plots = 1056
Number of Plots (#1) = 144



Goodwin Creek Watershed #2
Number of Acres = 4421.6
Number of Plots = 116



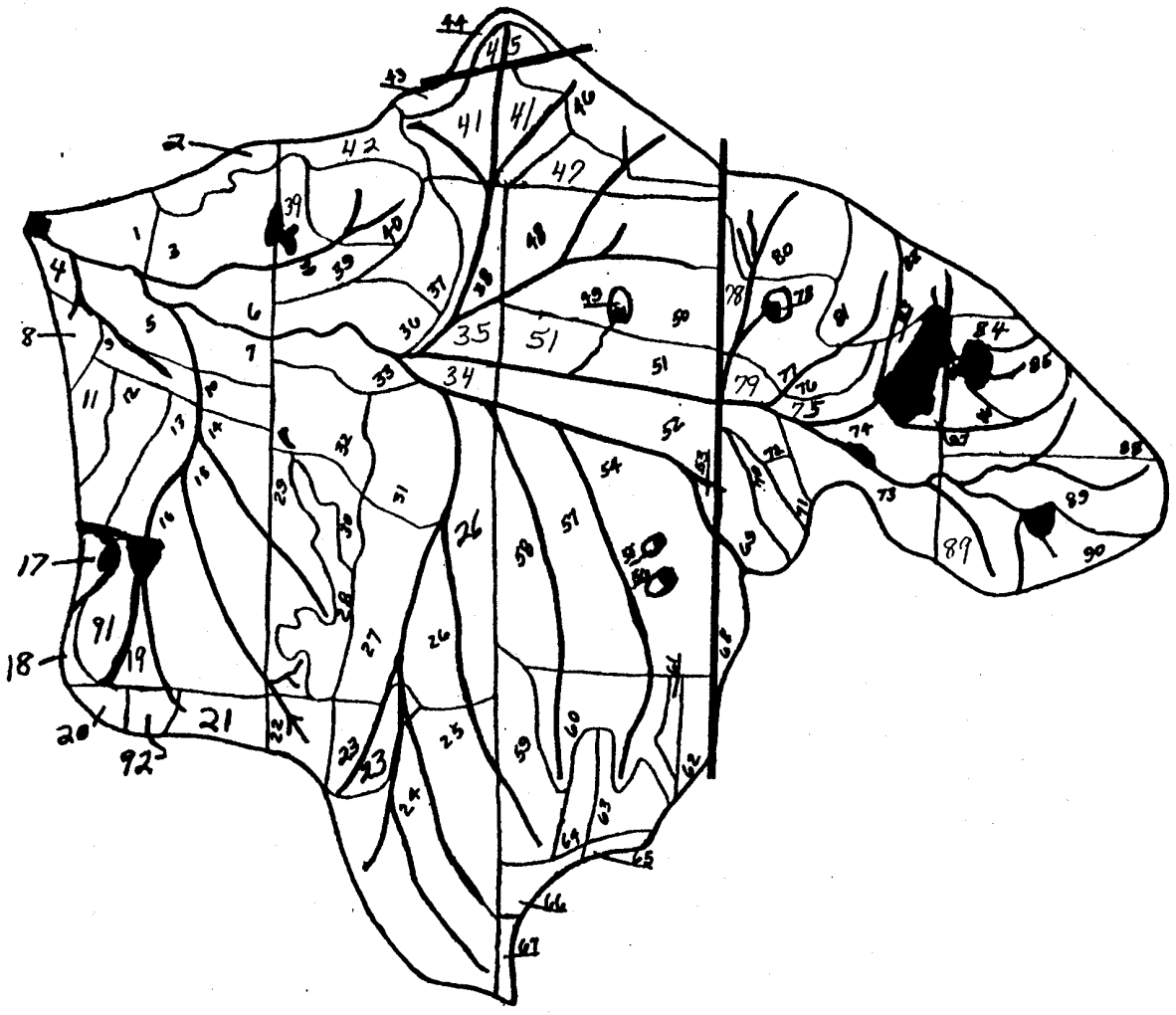
Goodwin Creek Watershed #3
Number of Acres = 2145.0
Number of Plots = 175



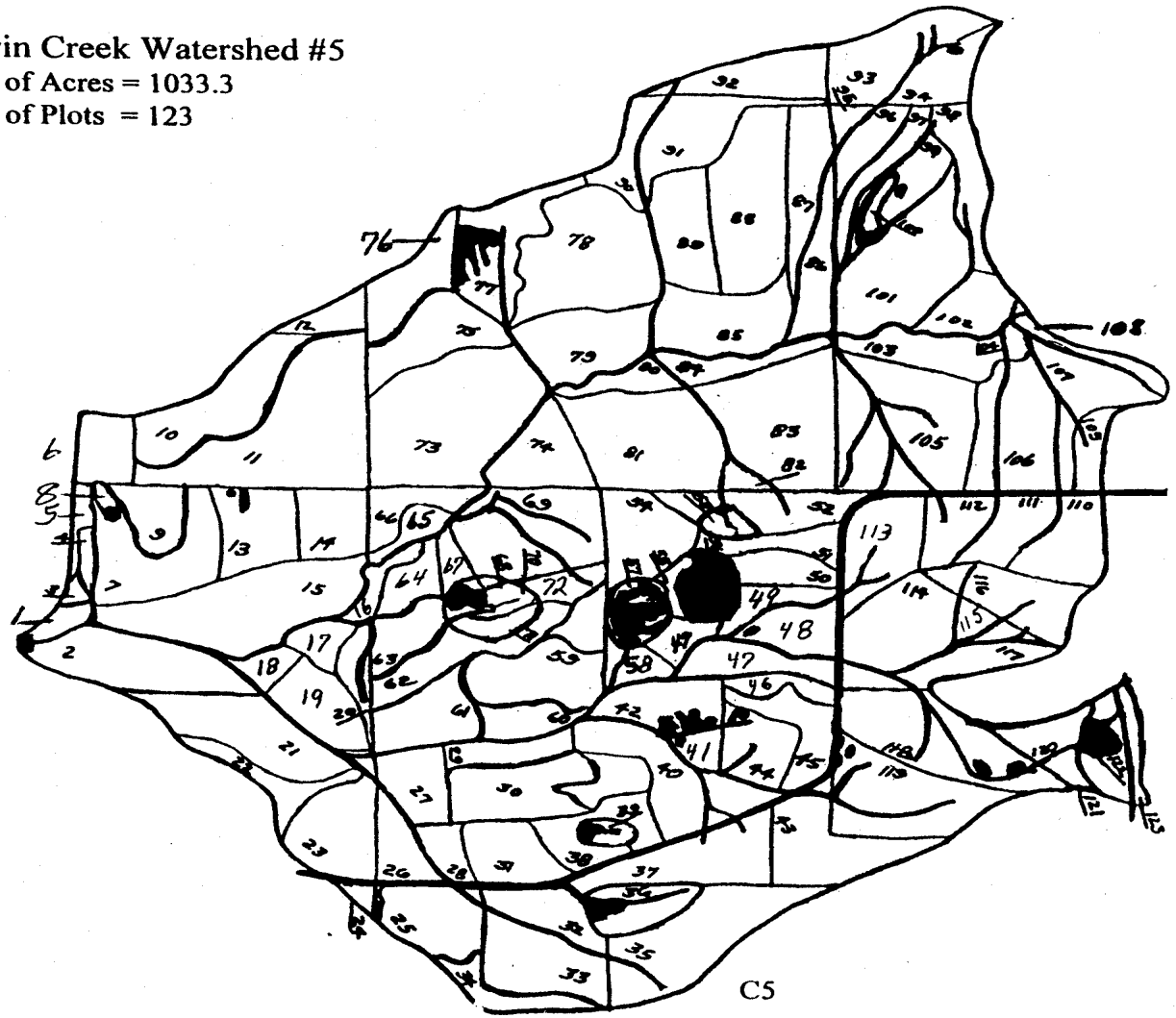
Continuation of watershed #3

C3

Goodwin Creek Watershed #4
Number of Acres = 893.7
Number of Plots = 92

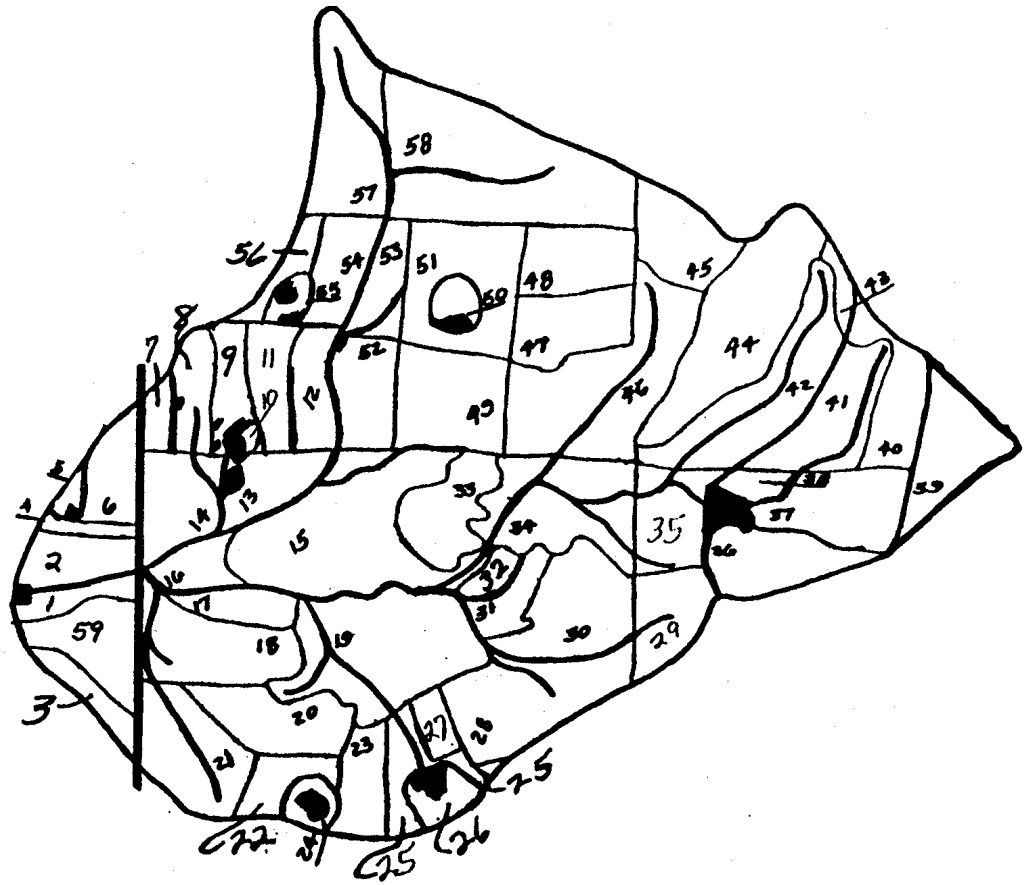


Goodwin Creek Watershed #5
Number of Acres = 1033.3
Number of Plots = 123

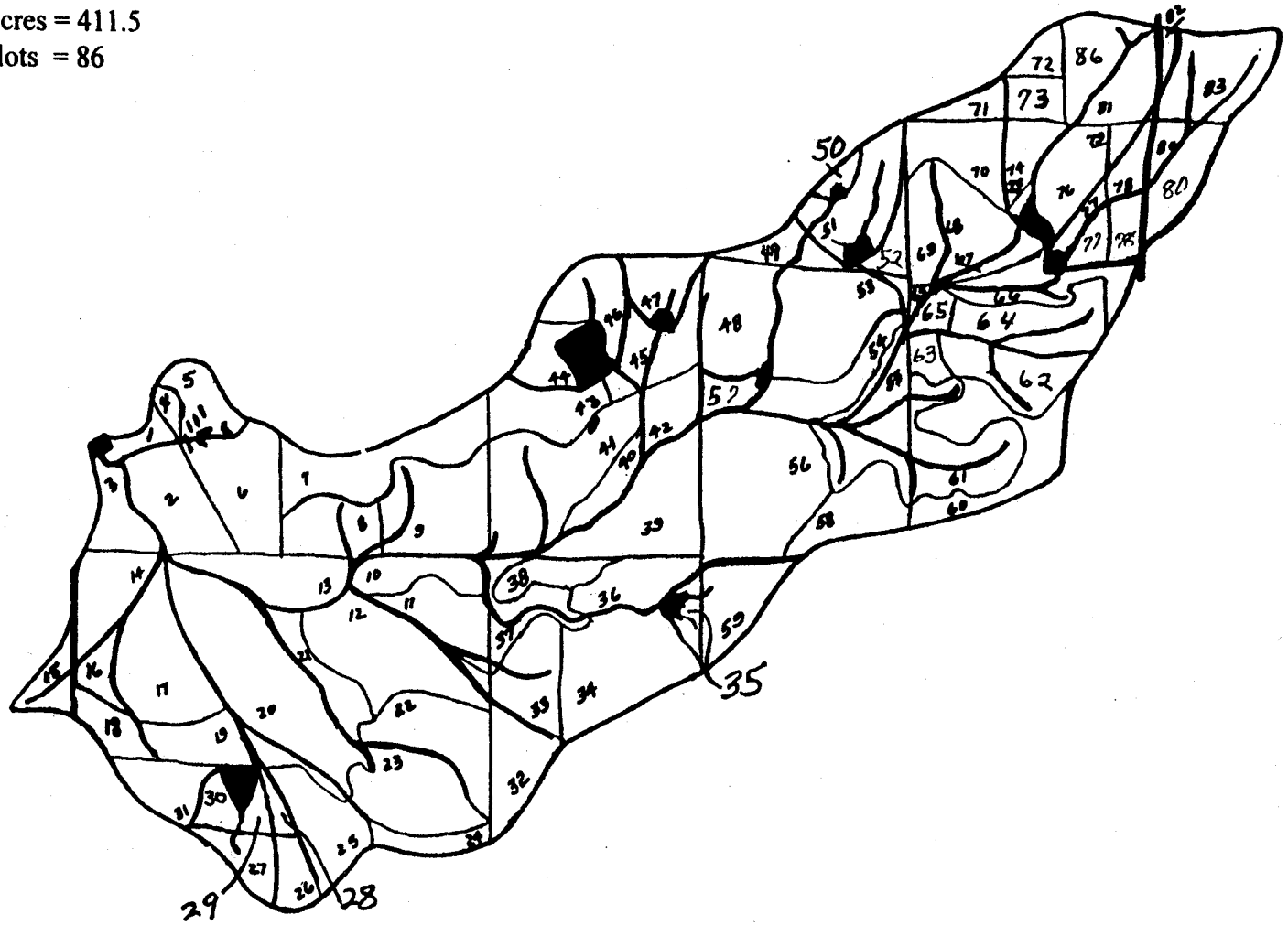


C5

Goodwin Creek Watershed #6
Number of Acres = 311.3
Number of Plots = 59



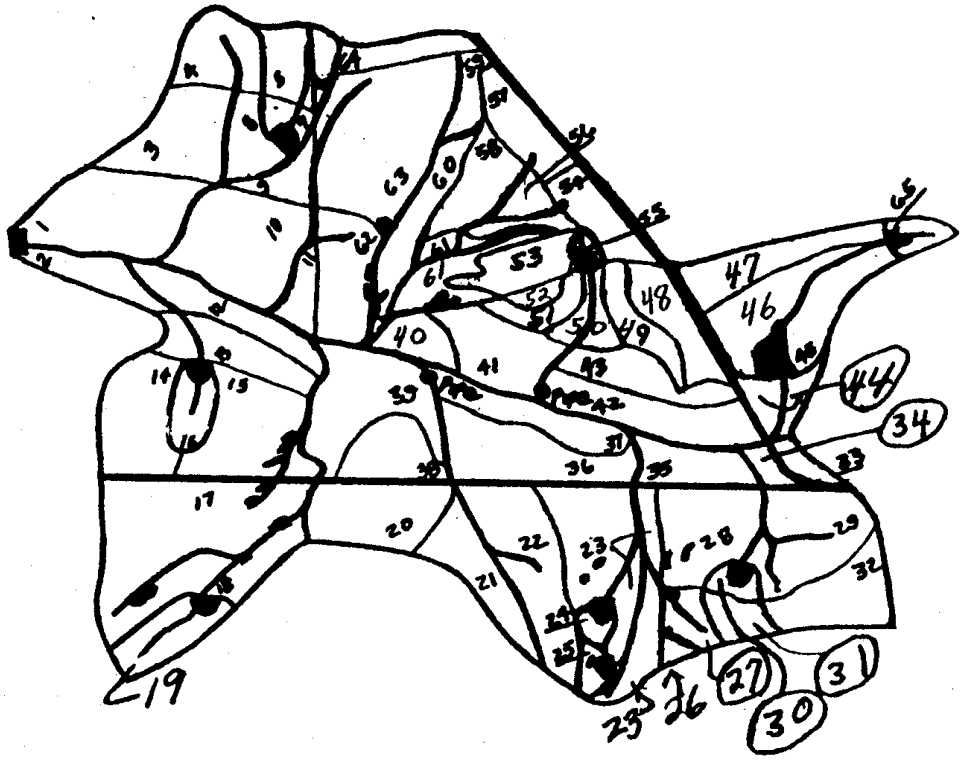
Goodwin Creek Watershed #7
Number of Acres = 411.5
Number of Plots = 86



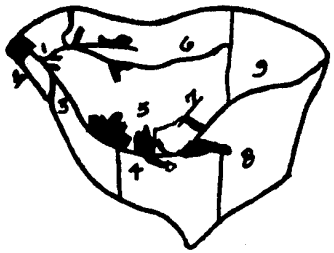
Goodwin Creek Watershed #8

Number of Acres = 364.2

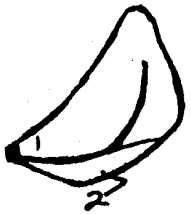
Number of Plots = 66



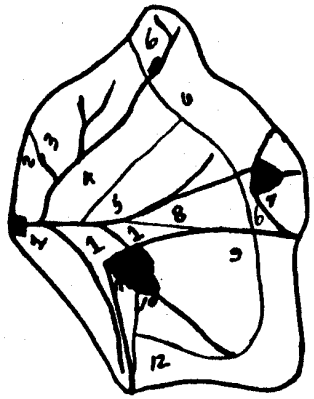
Goodwin Creek Watershed #9
Number of Acres = 39.8
Number of Plots = 92



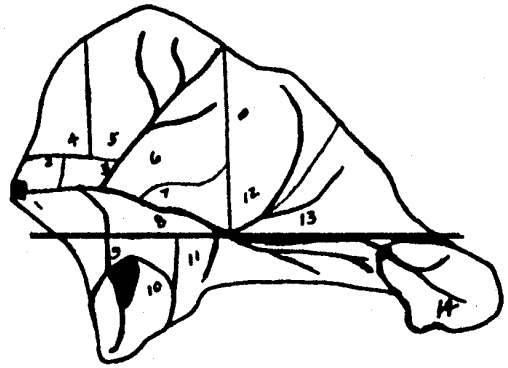
Goodwin Creek Watershed #10
Number of Acres = 13
Number of Plots = 2



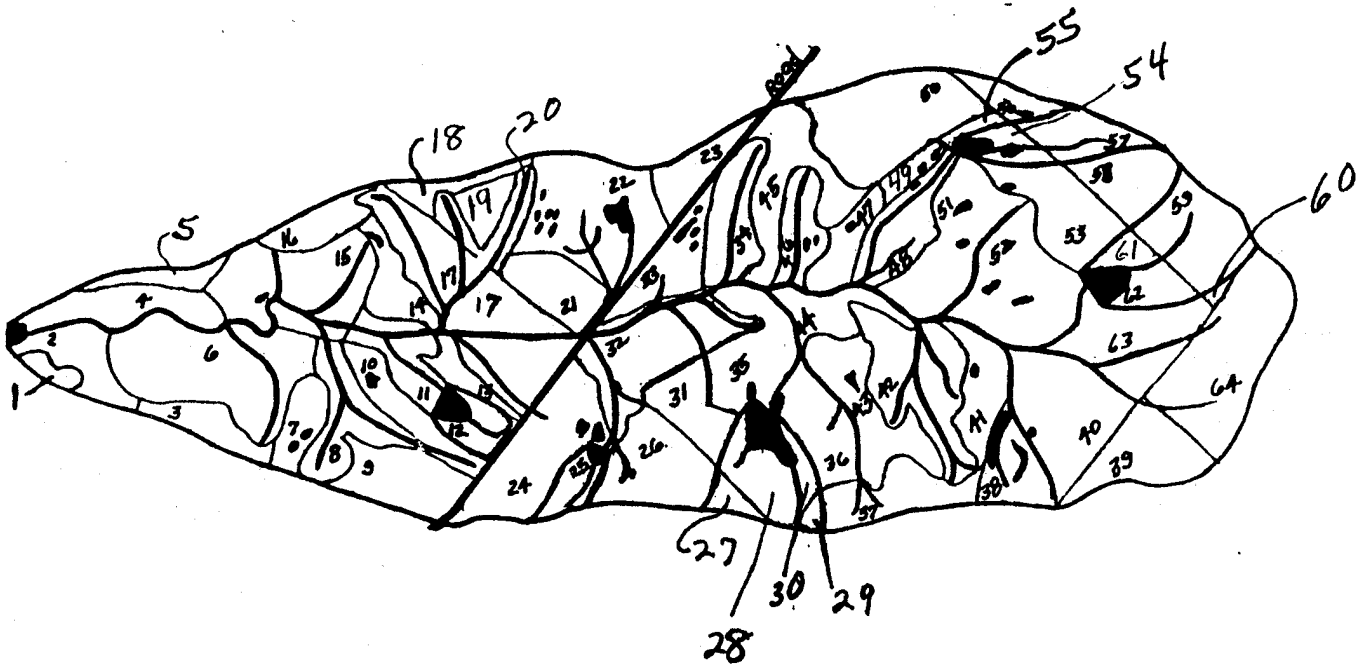
Goodwin Creek Watershed #11
Number of Acres = 65.3
Number of Plots = 12



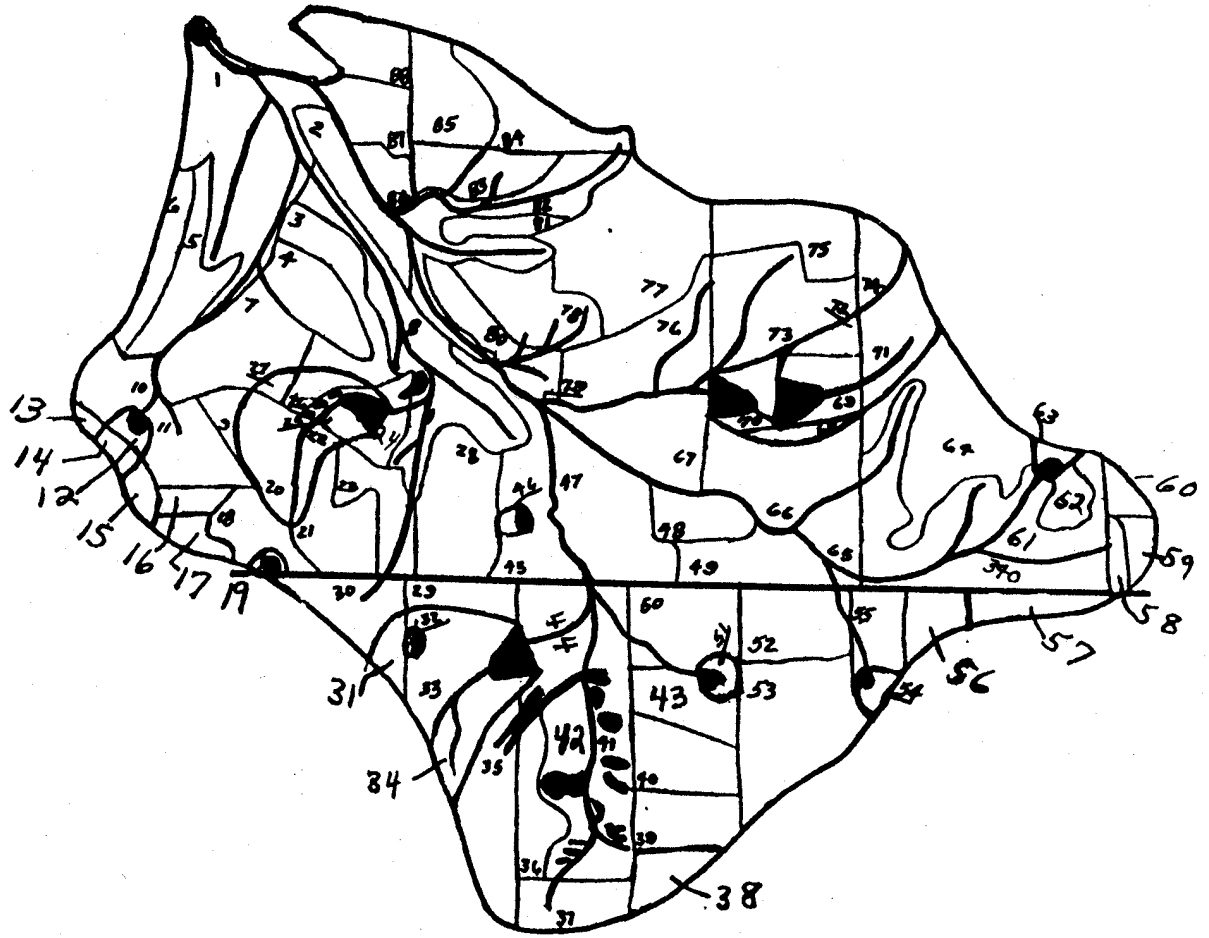
Goodwin Creek Watershed #12
Number of Acres = 73.9
Number of Plots = 14



Goodwin Creek Watershed #13
Number of Acres = 303.4
Number of Plots = 65

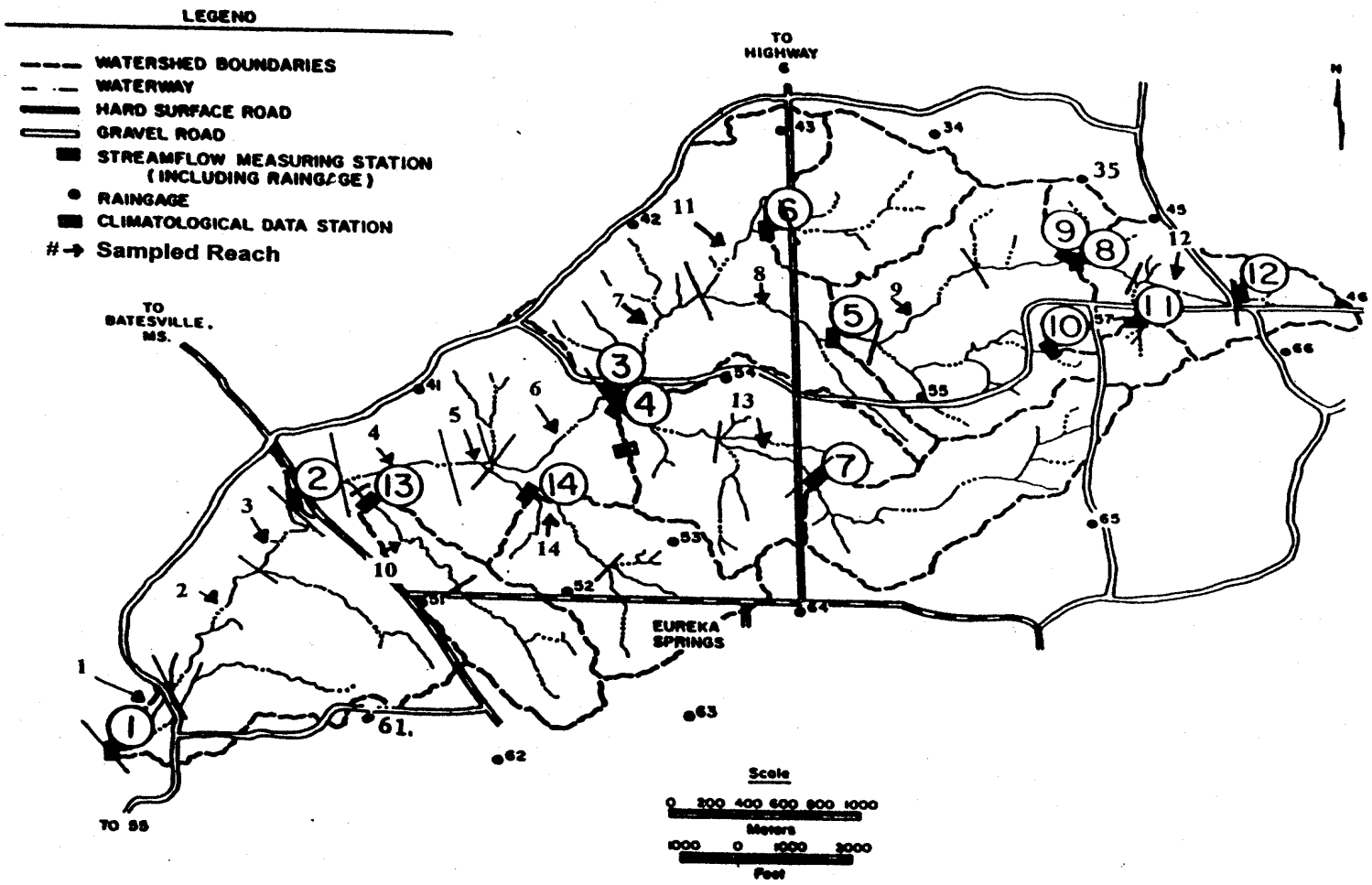


Goodwin Creek Watershed #14
Number of Acres = 411.9
Number of Plots = 88



APPENDIX D

Particle Size Distributions of Selected Channel Reaches in Goodwin Creek Watershed



Location of Sampled Reaches in Goodwin Creek Watershed

Reach 1 Date: 5/09/94

Total Sample 64435.3 grams
Percent Gravel 40.09091
Percent Sand 59.90909
Total Gravel 25832.7 grams
Total Gravel Analyzed 25832.7 grams
Total Sand 38602.6 grams
Total Sand Analyzed 47.77 grams

Sieve Size	Phi	Amount	Percent	Percent Finer
64	-6	0	0	100
53.8	-5.75	0	0	100
45.3	-5.5	0	0	100
38.1	-5.25	116.6	0.18	99.82
32	-5	526.9	0.82	99
26.9	-4.75	625	0.97	98.03
22.6	-4.5	1442	2.24	95.79
19	-4.25	1706.2	2.65	93.15
15.9	-4	1842.3	2.86	90.29
13.5	-3.75	1886.3	2.93	87.36
11.2	-3.5	2520.5	3.91	83.45
9.51	-3.25	1929	2.99	80.45
8	-3	2256.3	3.5	76.95
6.73	-2.75	1872.2	2.91	74.05
5.66	-2.5	1593.2	2.47	71.57
4.76	-2.25	1354.4	2.1	69.47
4	-2	1701.1	2.64	66.83
3.36	-1.75	1081.4	1.68	65.15
2.83	-1.5	1240.2	1.92	63.23
2.38	-1.25	1126.8	1.75	61.48
2	-1	1012.3	1.57	59.91
1.7	-0.75	1.33	1.67	58.24
1.4	-0.5	1.92	2.41	55.83
1.18	-0.25	1.96	2.46	53.38
1	0	1.81	2.27	51.11
0.85	0.25	3.85	4.83	46.28
0.71	0.5	3.41	4.26	42
0.6	0.75	5.45	6.83	35.17
0.5	1	7.8	9.78	25.38
0.425	1.25	5.85	7.34	18.05
0.355	1.5	6.34	7.95	10.1
0.3	1.75	4.13	5.18	4.92
0.25	2	1.98	2.48	2.43
0.212	2.25	1.94	2.43	0

Reach 2 **Date: 5/10/94**

Total Sample 143920.9 grams
Percent Gravel 47.40528
Percent Sand 52.59473
Total Gravel 68226.1 grams
Total Gravel Analyzed 68226.1 grams
Total Sand 75694.8 grams
Total Sand Analyzed 47.04 grams

Sieve Size	Phi	Amount	Percent	Percent Finer
64	-6	0	0	100
53.8	-5.75	0	0	100
45.3	-5.5	0	0	100
38.1	-5.25	1246.2	0.87	99.13
32	-5	3055.3	2.12	97.01
26.9	-4.75	4231.4	2.94	94.07
22.6	-4.5	5990.9	4.16	89.91
19	-4.25	5354.9	3.72	86.19
15.9	-4	5448.2	3.79	82.4
13.5	-3.75	5254.6	3.65	78.75
11.2	-3.5	5897.2	4.1	74.65
9.51	-3.25	4163.5	2.89	71.76
8	-3	4974.5	3.46	68.3
6.73	-2.75	4162.1	2.89	65.41
5.66	-2.5	3463.4	2.41	63.01
4.76	-2.25	2659.7	1.85	61.16
4	-2	3722.9	2.59	58.57
3.36	-1.75	2191.1	1.52	57.05
2.83	-1.5	2420.1	1.68	55.37
2.38	-1.25	2036	1.41	53.95
2	-1	1954.1	1.36	52.59
1.7	-0.75	1.27	1.42	51.17
1.4	-0.5	1.23	1.38	49.8
1.18	-0.25	1.45	1.62	48.18
1	0	1.49	1.67	46.51
0.85	0.25	3.04	3.4	43.11
0.71	0.5	2.92	3.26	39.85
0.6	0.75	4.87	5.45	34.4
0.5	1	6.91	7.73	26.68
0.425	1.25	6.03	6.74	19.94
0.355	1.5	7.2	8.05	11.89
0.3	1.75	5.48	6.13	5.76
0.25	2	2.75	3.07	2.68
0.212	2.25	2.4	2.68	0

Reach 3 **Date: 5/11-13/94**

Total Sample 126433.8 grams
Percent Gravel 58.02444
Percent Sand 41.97557
Total Gravel 73362.5 grams
Total Gravel Analyzed 73362.5 grams
Total Sand 53071.3 grams
Total Sand Analyzed 89.15 grams

Sieve Size	Phi	Amount	Percent	Percent Finer
64	-6	0	0	100
53.8	-5.75	0	0	100
45.3	-5.5	391.6	0.31	99.69
38.1	-5.25	2123.1	1.68	98.01
32	-5	4615	3.65	94.36
26.9	-4.75	5683.8	4.5	89.87
22.6	-4.5	6684.7	5.29	84.58
19	-4.25	5765.8	4.56	80.02
15.9	-4	5719.2	4.52	75.49
13.5	-3.75	5205.5	4.12	71.38
11.2	-3.5	5709.6	4.52	66.86
9.51	-3.25	4325.5	3.42	63.44
8	-3	5000.7	3.96	59.49
6.73	-2.75	4082	3.23	56.26
5.66	-2.5	3466.2	2.74	53.52
4.76	-2.25	2800.8	2.22	51.3
4	-2	3491.2	2.76	48.54
3.36	-1.75	2146.3	1.7	46.84
2.83	-1.5	2352.1	1.86	44.98
2.38	-1.25	1981.2	1.57	43.41
2	-1	1818.2	1.44	41.98
1.7	-0.75	2	0.94	41.03
1.4	-0.5	2.79	1.31	39.72
1.18	-0.25	3.01	1.42	38.3
1	0	2.95	1.39	36.91
0.85	0.25	6.59	3.1	33.81
0.71	0.5	6.81	3.21	30.6
0.6	0.75	11.35	5.34	25.26
0.5	1	14.81	6.97	18.29
0.425	1.25	12	5.65	12.64
0.355	1.5	12.26	5.77	6.86
0.3	1.75	7.8	3.67	3.19
0.25	2	3.64	1.71	1.48
0.212	2.25	3.14	1.48	0

Reach 4 **Date: 5/16/94**

Total Sample 98926.4 grams
Percent Gravel 64.54496
Percent Sand 35.45505
Total Gravel 63852.0 grams
Total Gravel Analyzed 63852.0 grams
Total Sand 35074.4 grams
Total Sand Analyzed 45.4 grams

Sieve Size	Phi	Amount	Percent	Percent Finer
64	-6	0	0	100
53.8	-5.75	0	0	100
45.3	-5.5	1725.9	1.74	98.26
38.1	-5.25	2359.8	2.39	95.87
32	-5	3779.3	3.82	92.05
26.9	-4.75	5440.4	5.5	86.55
22.6	-4.5	6620.7	6369	79.86
19	-4.25	5289.8	5.35	74.51
15.9	-4	4951.2	5	69.51
13.5	-3.75	4402.4	4.45	65.06
11.2	-3.5	4565.7	4.62	60.44
9.51	-3.25	3582.6	3.62	56.82
8	-3	4011.6	4.06	52.76
6.73	-2.75	3200.5	3.24	49.53
5.66	-2.5	2759	2.79	46.74
4.76	-2.25	2195.8	2.22	44.52
4	-2	2750.6	2.79	41.74
3.36	-1.75	1628.8	1.65	40.09
2.83	-1.5	1736.1	1.75	38.34
2.38	-1.25	1512.7	1.53	36.81
2	-1	1339.1	1.35	35.46
1.7	-0.75	2.06	1.61	33.85
1.4	-0.5	2.38	1.86	31.99
1.18	-0.25	2.33	1.82	30.17
1	0	2.22	1.73	28.43
0.85	0.25	4.57	3.57	24.87
0.71	0.5	3.82	2.98	21.88
0.6	0.75	6.18	4.83	17.06
0.5	1	7.19	5.62	11.44
0.425	1.25	5.2	4.06	7.38
0.355	1.5	4.74	3.7	3.68
0.3	1.75	2.53	1.98	1.7
0.25	2	1.13	0.88	0.82
0.212	2.25	1.05	0.82	0

Reach 5 **Date: 5/16-17/94**

Total Sample 59896.8 grams
Percent Gravel 56.3172
Percent Sand 43.6828
Total Gravel 33732.2 grams
Total Gravel Analyzed 33732.2 grams
Total Sand 26164.6 grams
Total Sand Analyzed 39.63

Sieve Size	Phi	Amount	Percent	Percent Finer
64	-6	0	0	100
53.8	-5.75	0	0	100
45.3	-5.5	1445.3	2.41	97.59
38.1	-5.25	721.3	1.2	96.38
32	-5	1210	2.02	94.36
26.9	-4.75	2345.7	3.92	90.45
22.6	-4.5	2516.5	4.2	86.25
19	-4.25	2202.7	3.68	82.57
15.9	-4	2288.5	3.82	78.75
13.5	-3.75	2215.7	3.7	75.05
11.2	-3.5	2694.7	4.5	70.55
9.51	-3.25	1893	3.16	67.39
8	-3	2257.8	3.77	63.62
6.73	-2.75	2010.4	3.36	60.26
5.66	-2.5	1804.2	3.01	57.25
4.76	-2.25	1603	2.51	54.74
4	-2	1711.7	2.86	51.88
3.36	-1.75	1345.3	2.25	49.64
2.83	-1.5	1309.9	2.19	47.45
2.38	-1.25	1134.1	1.89	45.56
2	-1	1122.4	1.87	43.68
1.7	-0.75	1.58	1.74	41.94
1.4	-0.5	1.94	2.14	39.8
1.18	-0.25	1.87	2.06	37.74
1	0	1.62	1.79	35.96
0.85	0.25	3.42	3.77	32.19
0.71	0.5	2.91	3.21	28.98
0.6	0.75	4.68	5.16	23.82
0.5	1	5.46	6.02	17.8
0.425	1.25	4.1	4.52	13.28
0.355	1.5	4.44	4.89	8.39
0.3	1.75	3.27	3.6	4.78
0.25	2	1.93	2.13	2.66
0.212	2.25	2.41	2.66	0

Reach 6 Date 5/18/94

Total Sample 149515.2 grams
Percent Gravel 64.33607
Percent Sand 35.66393 grams
Total Gravel 96192.21 grams
Total Gravel Analyzed 96192.21 grams
Total Sand 53323.0 grams
Total Sand Analyzed 42.15 grams

Sieve Size	Phi	Amount	Percent	Percent Finer
64	-6	0	0	100
53.8	-5.75	1347.8	0.9	99.1
45.3	-5.5	2608.9	1.74	97.35
38.1	-5.25	3238.9	2.17	95.19
32	-5	6635.4	4.44	90.75
26.9	-4.75	7075.6	4.73	86.02
22.6	-4.5	9129.7	6.11	79.91
19	-4.25	7970.3	5.33	74.58
15.9	-4	7205.8	4.82	69.76
13.5	-3.75	6509.4	4.35	65.41
11.2	-3.5	6936.2	4.64	60.77
9.51	-3.25	5105.6	3.41	57.35
8	-3	6130.6	4.1	53.25
6.73	-2.75	4918.9	3.29	49.96
5.66	-2.5	4253.1	2.84	47.12
4.76	-2.25	3387.7	2.27	44.85
4	-2	3941.4	2.64	42.22
3.36	-1.75	2655.3	1.78	40.44
2.83	-1.5	2746.8	1.84	38.6
2.38	-1.25	2344.4	1.57	37.04
2	-1	2050.4	1.37	35.66
1.7	-0.75	1.59	1.35	34.32
1.4	-0.5	2.04	1.73	32.59
1.18	-0.25	1.96	1.66	30.93
1	0	1.63	1.38	29.55
0.85	0.25	3.68	3.11	26.44
0.71	0.5	3.23	2.73	23.71
0.6	0.75	5.13	4.34	19.37
0.5	1	6.2	5.25	14.12
0.425	1.25	4.63	3.92	10.2
0.355	1.5	4.85	4.1	6.1
0.3	1.75	3.24	2.74	3.36
0.25	2	1.66	1.4	1.95
0.212	2.25	2.31	1.95	0

Reach 7 **Date 5/23/94**

Total Sample 111111.70 grams
Percent Gravel 56.27247
Percent Sand 43.72753
Total Gravel 62525.3 grams
Total Gravel Analyzed 62525.3 grams
Total Sand 48586.4 grams
Total Sand Analyzed 44.18 grams

Sieve Size	Phi	Amount	Percent	Percent Finer
64	-6	0	0	100
53.8	-5.75	0	0	100
45.3	-5.5	1752.4	1.58	98.42
38.1	-5.25	1726.4	1.55	96.87
32	-5	3245.4	2.92	93.95
26.9	-4.75	4282.8	3.85	90.09
22.6	-4.5	6578.1	5.92	84.17
19	-4.25	5477.9	4.93	79.24
15.9	-4	4606.5	4.15	75.1
13.5	-3.75	4306.9	3.88	71.22
11.2	-3.5	4540.4	4.09	67.14
9.51	-3.25	3421.2	3.08	64.06
8	-3	3924	3.53	60.52
6.73	-2.75	3313.9	2.98	57.54
5.66	-2.5	2871.4	2.58	54.96
4.76	-2.25	2249.7	2.02	52.93
4	-2	3050	2.74	50.19
3.36	-1.75	1928.4	1.74	48.45
2.83	-1.5	2017.2	1.82	46.64
2.38	-1.25	1660	1.49	45.14
2	-1	1572.7	1.42	43.73
1.7	-0.75	1.32	1.31	42.42
1.4	-0.5	1.66	1.64	40.78
1.18	-0.25	1.61	1.59	39.18
1	0	1.46	1.45	37.74
0.85	0.25	3.25	3.22	34.52
0.71	0.5	2.94	2.91	31.61
0.6	0.75	4.75	4.7	26.91
0.5	1	6.49	6.42	20.49
0.425	1.25	5.21	5.16	15.33
0.355	1.5	6	5.94	9.39
0.3	1.75	4.32	4.28	5.12
0.25	2	2.31	2.29	2.83
0.212	2.25	2.86	2.83	0

Reach 8 Date 5/24/94

Total Sample 121701.9 grams
Percent Gravel 43.52175
Percent Sand 56.47825
Total Gravel 52966.8 grams
Total Gravel Analyzed 52966.8 grams
Total Sand 68735.1 grams
Total Sand Analyzed 41.32 grams

Sieve Size	Phi	Amount	Percent	Percent Finer
64	-6	0	0	100
53.8	-5.75	0	0	100
45.3	-5.5	476	0.39	99.61
38.1	-5.25	691.3	0.57	99.04
32	-5	2817.7	2.32	96.73
26.9	-4.75	2905.4	2.39	94.34
22.6	-4.5	4542.5	3.73	90.61
19	-4.25	3861.5	3.17	87.43
15.9	-4	3731.9	3.07	84.37
13.5	-3.75	3677.2	3.02	81.34
11.2	-3.5	4074.6	3.35	78
9.51	-3.25	3019.5	2.48	75.52
8	-3	3684.8	3.03	72.49
6.73	-2.75	3135.4	2.58	69.91
5.66	-2.5	2775.5	2.28	67.63
4.76	-2.25	2415.7	1.98	65.65
4	-2	2923.4	2.4	63.24
3.36	-1.75	2156.7	1.77	61.47
2.83	-1.5	2196.4	1.8	59.67
2.38	-1.25	1973.5	1.62	58.05
2	-1	1907.8	1.57	56.48
1.7	-0.75	1.2	1.64	54.84
1.4	-0.5	1.57	2.15	52.69
1.18	-0.25	1.49	2.04	50.66
1	0	1.55	2.12	48.54
0.85	0.25	3.21	4.39	44.15
0.71	0.5	2.96	4.05	40.1
0.6	0.75	5.13	7.01	33.09
0.5	1	6.07	8.3	24.79
0.425	1.25	4.87	6.66	18.14
0.355	1.5	5.47	7.48	10.66
0.3	1.75	3.95	5.4	5.26
0.25	2	1.88	2.57	2.69
0.212	2.25	1.97	2.69	0

Reach 9 Date 6/8/94

Total Sample 72722.9 grams
Percent Gravel 46.3539
Percent Sand 53.6461
Total Gravel 33709.9 grams
Total Gravel Analyzed 33709.9 grams
Total Sand 39013.0 grams
Total Sand Analyzed 38.86 grams

Sieve Size	Phi	Amount	Percent	Percent Finer
64	-6	0	0	100
53.8	-5.75	0	0	100
45.3	-5.5	125.4	0.17	99.83
38.1	-5.25	388.5	0.53	99.29
32	-5	1460.3	2.01	97.29
26.9	-4.75	2170.5	2.98	94.3
22.6	-4.5	3176.4	4.37	89.93
19	-4.25	2726.8	3.75	86.18
15.9	-4	2670	3.67	82.51
13.5	-3.75	2502.5	3.44	79.07
11.2	-3.5	2579.4	3.55	75.52
9.51	-3.25	2087.1	2.87	72.65
8	-3	2376.8	3.27	69.39
6.73	-2.75	2038.7	2.8	66.58
5.66	-2.5	1779.5	2.45	64.14
4.76	-2.25	1490.3	2.05	62.09
4	-2	1732.9	2.38	59.7
3.36	-1.75	1160.7	1.6	58.11
2.83	-1.5	1213.3	1.67	56.44
2.38	-1.25	1041.1	1.43	55.01
2	-1	989.7	1.36	53.65
1.7	-0.75	1.05	1.45	52.2
1.4	-0.5	1.23	1.7	50.5
1.18	-0.25	1.29	1.78	48.72
1	0	1.19	1.64	47.07
0.85	0.25	2.48	3.42	43.65
0.71	0.5	2.36	3.26	40.39
0.6	0.75	3.96	5.47	34.93
0.5	1	5.09	7.03	27.9
0.425	1.25	4.29	5.92	21.98
0.355	1.5	5.18	7.15	14.83
0.3	1.75	4.11	5.67	9.15
0.25	2	2.35	3.24	5.91
0.212	2.25	4.28	5.91	0

Reach 10 Date 6/09/94

Total Sample 72366.71 grams
Percent Gravel 64.36413
Percent Sand 35.63587
Total Gravel 46578.2 grams
Total Gravel Analyzed 46578.2 grams
Total Sand 25788.5 grams
Total Sand Analyzed 38.86 grams

Sieve Size	Phi	Amount	Percent	Percent Finer
64	-6	0	0	100
53.8	-5.75	0	0	100
45.3	-5.5	915.6	1.27	98.73
38.1	-5.25	2335.1	3.23	95.51
32	-5	4059.1	5.61	89.9
26.9	-4.75	4300.2	5.94	83.96
22.6	-4.5	5305.6	7.33	76.63
19	-4.25	4424.4	6.11	70.51
15.9	-4	3238.7	4.48	66.04
13.5	-3.75	2946.6	4.07	61.96
11.2	-3.5	2874.4	3.97	57.99
9.51	-3.25	2389.3	3.3	54.69
8	-3	2346.9	3.24	51.45
6.73	-2.75	2045	2.83	48.62
5.66	-2.5	1659.4	2.29	46.33
4.76	-2.25	1412.8	1.95	44.38
4	-2	1660.7	2.29	42.08
3.36	-1.75	1244.4	1.72	40.36
2.83	-1.5	1249	1.73	38.64
2.38	-1.25	1130.8	1.56	37.07
2	-1	1040.2	1.44	35.64
1.7	-0.75	1.42	1.3	34.33
1.4	-0.5	1.75	1.6	32.73
1.18	-0.25	1.59	1.46	31.27
1	0	1.31	1.2	30.07
0.85	0.25	2.89	2.65	27.42
0.71	0.5	2.27	2.08	25.34
0.6	0.75	3.82	3.5	21.83
0.5	1	4.81	4.41	17.42
0.425	1.25	4.07	3.73	13.69
0.355	1.5	4.72	4.33	9.36
0.3	1.75	3.62	3.32	6.04
0.25	2	2.15	1.97	4.07
0.212	2.25	4.44	4.07	0

Reach 11 **Date: 6/13/94**

Total Sample 69077.3 grams
Percent Gravel 47.69078
Percent Sand 52.30923
Total Gravel 32943.5 grams
Total Gravel Analyzed 32943.5 grams
Total Sand 36133.8 grams
Total Sand Analyzed 37.52 grams

Sieve Size	Phi	Amount	Percent	Percent Finer
64	-6	0	0	100
53.8	-5.75	0	0	100
45.3	-5.5	1047.3	1.52	98.48
38.1	-5.25	1722.2	2.49	95.99
32	-5	2253.3	3.26	92.73
26.9	-4.75	2220.7	3.21	89.51
22.6	-4.5	2923.8	4.23	85.28
19	-4.25	2354.8	3.41	81.87
15.9	-4	1690.2	2.45	79.43
13.5	-3.75	1871.6	2.71	76.72
11.2	-3.5	2048.2	2.97	73.75
9.51	-3.25	1507.8	2.18	71.57
8	-3	2022.1	2.93	68.64
6.73	-2.75	1865.7	2.7	65.94
5.66	-2.5	1697	2.46	63.48
4.76	-2.25	1513.2	2.19	61.29
4	-2	1668.5	2.42	58.88
3.36	-1.75	1304.1	1.89	56.99
2.83	-1.5	1223.7	1.77	55.22
2.38	-1.25	1063.7	1.54	53.68
2	-1	945.6	1.37	52.31
1.7	-0.75	0.83	1.16	51.15
1.4	-0.5	0.7	0.98	50.18
1.18	-0.25	0.78	1.09	49.09
1	0	0.8	1.12	47.97
0.85	0.25	2.01	2.8	45.17
0.71	0.5	1.89	2.63	42.54
0.6	0.75	3.58	4.99	37.54
0.5	1	5.09	7.1	30.45
0.425	1.25	4.4	6.13	24.31
0.355	1.5	5.49	7.65	16.66
0.3	1.75	4.58	6.39	10.28
0.25	2	2.89	4.03	6.25
0.212	2.25	4.48	6.25	0

Reach 12 **Date: 6/14/94**

Total Sample 66921.3 grams
Percent Gravel 29.73389
Percent Sand 70.26612
Total Gravel 19898.3 grams
Total Gravel Analyzed 19898.3 grams
Total Sand 47023.0 grams
Total Sand Analyzed 45.63 grams

Sieve Size	Phi	Amount	Percent	Percent Finer
64	-6	0	0	100
53.8	-5.75	0	0	100
45.3	-5.5	363.6	0.54	99.46
38.1	-5.25	109.5	0.16	99.29
32	-5	427.9	0.64	98.65
26.9	-4.75	631.2	0.94	97.71
22.6	-4.5	1085.2	1.62	96.09
19	-4.25	875.6	1.31	94.78
15.9	-4	970.8	1.45	93.33
13.5	-3.75	880.8	1.32	92.01
11.2	-3.5	1351	2.02	89.99
9.51	-3.25	764.7	1.14	88.85
8	-3	2057.4	3.07	85.78
6.73	-2.75	2016.8	3.01	82.76
5.66	-2.5	1940.5	2.9	79.86
4.76	-2.25	1873.2	2.8	77.07
4	-2	1227	1.83	75.23
3.36	-1.75	961.4	1.29	73.94
2.83	-1.5	908.5	1.36	72.59
2.38	-1.25	800.9	1.2	71.39
2	-1	752.3	1.12	70.27
1.7	-0.75	0.65	1	69.27
1.4	-0.5	0.81	1.25	68.02
1.18	-0.25	0.86	1.32	66.69
1	0	0.66	1.02	65.68
0.85	0.25	1.65	2.54	63.14
0.71	0.5	1.57	2.42	60.72
0.6	0.75	2.43	3.74	56.98
0.5	1	3.93	6.05	50.92
0.425	1.25	3.73	5.74	45.18
0.355	1.5	5.52	8.5	36.68
0.3	1.75	6.05	9.32	27.36
0.25	2	5.93	9.13	18.23
0.212	2.25	11.84	18.23	0

Reach 13 **Date: 6/15/94**

Total Sample 67295 grams
Percent Gravel 51.49462
Percent Sand 48.50539
Total Gravel 34653.3 grams
Total Gravel Analyzed 34653.3 grams
Total Sand 32641.7 grams
Total Sand Analyzed 37.9 grams

Sieve Size	Phi	Amount	Percent	Percent Finer
64	-6	0	0	100
53.8	-5.75	209.3	0.31	99.69
45.3	-5.5	0	0	99.69
38.1	-5.25	1025.5	1.52	98.17
32	-5	2190.3	3.25	94.91
26.9	-4.75	2733.2	4.06	90.85
22.6	-4.5	3857.1	5.73	85.12
19	-4.25	2759.3	4.1	81.02
15.9	-4	2347.7	3.49	77.53
13.5	-3.75	2451.1	3.64	73.89
11.2	-3.5	2299	3.42	70.47
9.51	-3.25	1595.6	2.37	68.1
8	-3	1942.8	2.89	65.21
6.73	-2.75	1805.1	2.68	62.53
5.66	-2.5	1619	2.41	60.12
4.76	-2.25	1455.8	2.16	57.96
4	-2	1742.7	2.59	55.37
3.36	-1.75	1214.9	1.81	53.57
2.83	-1.5	1283.7	1.91	51.66
2.38	-1.25	1136.5	1.69	49.97
2	-1	984.7	1.46	48.51
1.7	-0.75	1.03	1.32	47.19
1.4	-0.5	1.23	1.57	45.61
1.18	-0.25	1.18	1.51	44.1
1	0	1	1.28	42.82
0.85	0.25	2.31	2.96	39.87
0.71	0.5	2.05	2.62	37.24
0.6	0.75	3.36	4.3	32.94
0.5	1	4.64	5.94	27
0.425	1.25	4.02	5.14	21.86
0.355	1.5	4.92	6.3	15.56
0.3	1.75	4.08	5.22	10.34
0.25	2	2.43	3.11	7.23
0.212	2.25	5.65	7.23	0

Reach 14 **Date: 6/16/94**

Total Sample 94871.6 grams
Percent Gravel 64.94725
Percent Sand 35.05275
Total Gravel 61616.5 grams
Total Gravel Analyzed 61616.5 grams
Total Sand 33255.1 grams
Total Sand Analyzed 38.7 grams

Sieve Size	Phi	Amount	Percent	Percent Finer
64	-6	0	0	100
53.8	-5.75	1037.1	1.09	98.91
45.3	-5.5	1837	1.94	96.97
38.1	-5.25	2489.6	2.62	94.35
32	-5	5001.4	5.27	89.07
26.9	-4.75	5052.1	5.33	83.75
22.6	-4.5	6981	7.36	76.39
19	-4.25	5300	5.59	70.8
15.9	-4	4359.9	4.6	66.21
13.5	-3.75	4154.4	4.38	61.83
11.2	-3.5	3917.6	4.13	57.7
9.51	-3.25	2910.2	3.07	54.63
.8	-3	3184.5	3.36	51.28
6.73	-2.75	2797	2.95	48.33
5.66	-2.5	2279.1	2.4	45.93
4.76	-2.25	1950.1	2.06	43.87
4	-2	2292.6	2.42	41.45
3.36	-1.75	1608.2	1.7	39.76
2.83	-1.5	1624.4	1.71	38.05
2.38	-1.25	1454	1.53	36.51
2	-1	1386.3	1.46	35.05
1.7	-0.75	2.27	2.06	33
1.4	-0.5	2.34	2.12	30.38
1.18	-0.25	1.84	1.67	29.21
1	0	1.62	1.47	27.74
0.85	0.25	2.85	2.58	25.16
0.71	0.5	2.43	2.2	22.96
0.6	0.75	4.04	3.66	19.3
0.5	1	5.29	4.79	14.51
0.425	1.25	4.09	3.7	10.81
0.355	1.5	4.21	3.81	6.99
0.3	1.75	3.15	2.85	4.14
0.25	2	1.87	1.69	2.45
0.212	2.25	2.7	2.45	0

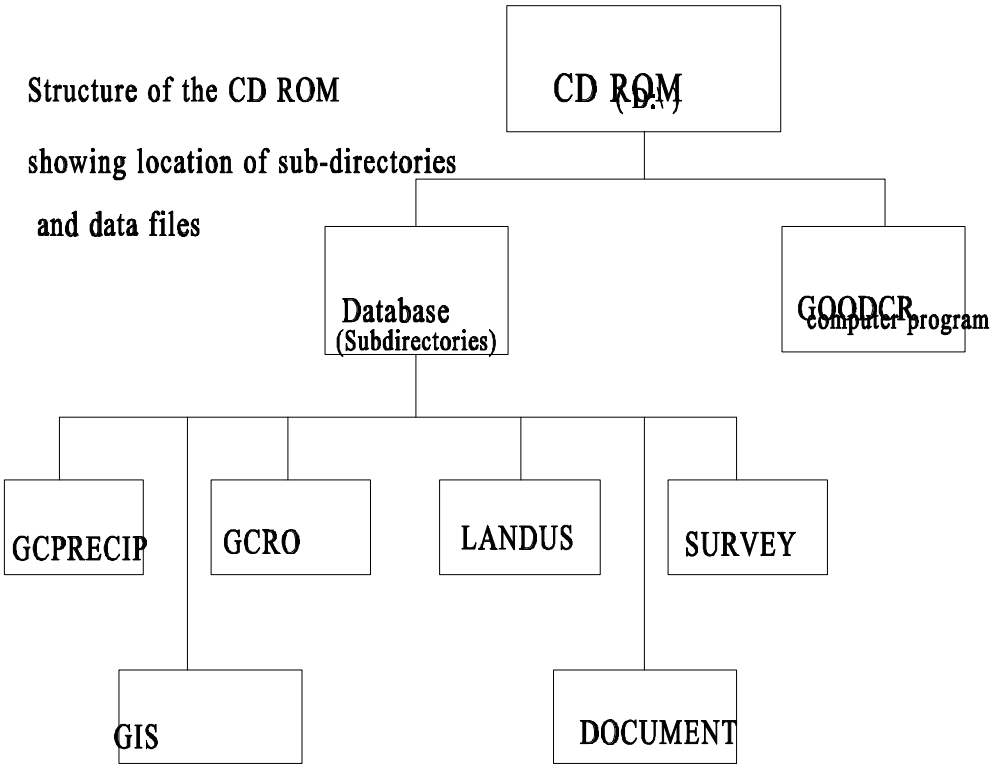
APPENDIX E

Structure, Description and Data on the CD ROM

Structure, Description, and Data on the CD ROM

The CD-ROM is structured to allow access on an interactive basis or as a database. Interactively, the user is presented with data and/or the document through use of a computer program. The program is initiated by typing GOODCR. It is a menu driven program used to access and present Goodwin Creek Watershed data. It allows the user to view, print or copy data for a specified station and time interval or sections of the document. As a database, the data is stored as ASCII (DOS) text files (see file descriptions, pp. E9-E15). Storage in an ASCII format allows the user to access and retrieve data for his or her personal use. The data is structured by sub-directory and file and is accessible by using DOS commands. The sub-directories for each type of data are given in the following:

Sub-Directory	Description of Data
GCPRECIP	Precipitation Files
GCRO	Runoff and Sediment Files
LANDUS	Land Use Files
SURVEY	Survey Files
GIS	ERDAS (Raster) Files
DOCUMENT	WordPerfect Document File



A brief definition and summary of each type of data is given. Also, a description of each type of data file is presented in the succeeding pages (E9-E15) which specifies the file name, structure (row and column) and location of each item of Goodwin Creek Watershed data.

Runoff and Sediment

Runoff refers to the flow that passes through the control at the point of measurement. In Goodwin Creek, runoff is collected on a daily basis. It is determined from the stage measurements in the flume structures. The data is calculated from rating curves (see Table 2.2) and presented as runoff rate in cubic feet per second (cfs) and in inches per hour (in./hr.), runoff interval (cfs-days), accumulated runoff in cfs-days and in inches.

Sediment is defined as the detachment, entrainment, transportation and deposition of eroded soil. In Goodwin Creek, fine (<0.062 mm) sediment samples are collected on a storm basis. The samples are analyzed to determine the concentration in parts per million (ppm). The sample concentrations are accumulated for each water year and appended to the database for the period of record (1978-1993). At the end of each water year, the concentration equations are produced using the least squares method. The equations are used to generate concentration values for stage breakpoints when no samples were taken. The types of data determined and presented are sediment interval in tons, accumulated sediment in tons and tons/acre, and concentration in parts per million.

Precipitation

Precipitation is defined as any moisture falling from the atmosphere in liquid or frozen form. In Goodwin Creek, precipitation is collected from 37 gages; however, some gages have been discontinued over the years. Precipitation is collected on a daily basis, however, only storm events are recorded. The data is processed and presented as storm break point data which includes station, time (month, day, year, hour and minute), and amount of precipitation in inches.

Land Use

Land use in Goodwin Creek Watershed was established from ground surveys to characterize the watershed for crop and cover condition and determine their influence. The surveys have been conducted on a yearly basis for the watershed and divided into subwatersheds and fields (see Appendix C). The classification used in the ground surveys has been divided into five categories: cultivated, pasture, idle land, forest and planted forest. Each class is defined and presented in number of contributing and non-contributing acres (see section 4.8.2 Ground Surveys).

Surveys

The Survey data consists of channel cross-section surveys of Goodwin Creek. Twenty-nine surveys have been conducted which represents a compilation of data from 1977 to 1995 (see section 4.6 Channel Surveys). Presently, only twenty-six survey data sets are available on the CD-ROM. Each set of cross-sections consists of cross-section codes, current and corrected horizontal distance, elevation, point coordinates (Mississippi State Plane West (feet)) and point description.

GIS

The sub-directory contains ERDAS GIS (raster) files. The files were created using the ERDAS Geographical Information System, version 7.5 and TOPAZ. The files presented and titled in the sub-directory are land use (GCLU.GIS), slope (GCSLOPE.GIS), aspect (GCASPECT.GIS), elevation (GCRELIEF.GIS), watershed boundary (GCBND.GIS), subwatersheds (GCSUBWAT.GIS) and Strahler

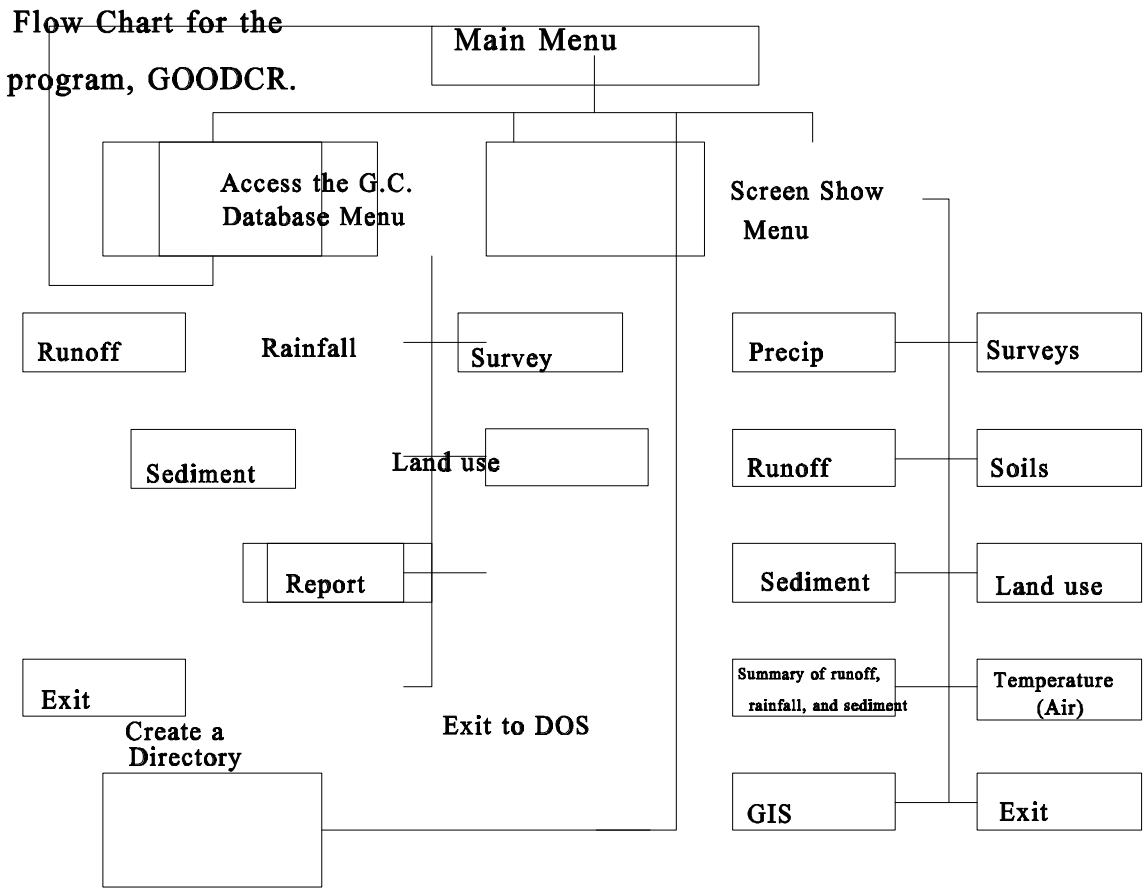
drainage network (GCNETWRK). The watershed boundary, subwatersheds and drainage network files were created using TOPAZ and put into an ERDAS GIS format (see ERDAS File description). Additionally, an ERDAS trailer file (.TRL) is included. A trailer file accompanies a ".GIS" file and contains information about the GIS classes.

WordPerfect Document

This is a copy of the Goodwin Creek Watershed report stored in a WordPerfect format, version 6.0.

GOODCR (Computer Program)

As stated above, GOODCR is a computer program used to access and present Goodwin Creek Watershed data. The program allows the user to view, print and/or copy data for a specified station and time interval or section of the document. To run the program, change directory to D drive of the computer (CD D:\ or the letter, which specifies the CD ROM drive). The program is started by typing GOODCR at the prompt and follows the instructions on the screen (menu). To exit the program and return to DOS, choose the "exit" option at the prompt in the program. An overview of the program is illustrated by a flow chart on page E5. Also, a description of the program's menus and options are given on pages E6, E7 and E8.



Menus and Options of the Computer Program GOODCR

Main Menu	
Command	**Description**
CD D:\	Changes the directory of the computer to the CD ROM drive
D:\>GOODCR	Initiates the program and shows the main menu and gives the following options: (1) Access the Goodwin Creek Database (2) Start the Goodwin Creek Screen Show (3) Exit menu and return to DOS (4) Create a Directory -- creates a sub-directory "Goodwin" on the root directory ----Choice of 1, 2, 3 or 4 takes the user to the specified option

Option (1)	Access the Goodwin Creek Database -- presents a menu with the following options: (1) Report -- Views the Goodwin Creek Report (2) Database -- Presents menu of available types of data (3) Exit -- Exits the user to the Main Menu
Option (2)	Start the Goodwin Creek Screen Show -- initiates a slide show showing graphs and images of Goodwin Creek Watershed Data files. The user views image and are given the option to continue viewing images or exit.
Option (3)	Exits the user from the program and returns to a DOS.
Option (4)	Designed for first time users, the option creates a sub-directory on the root directory of the computer entitled "Goodwin". The Goodwin sub-directory will then be used to store all files that are copied from the database. After creating the sub-directory, the user will be returned to the main menu for the next option.

Screen Show Menu	
Command	**Description**
(A) Precip	A series of graphs showing precipitation (rainfall) for Goodwin Creek Watershed for the period of record (1981-1993).
(B) Runoff	A series of graphs showing runoff for Goodwin Creek Watershed for the period of record (1982-1993).
(C) Sediment	A series of graphs showing sediment for Goodwin Creek Watershed for the period of record (1978-1993).
(D) Summary of Runoff, Rainfall and Sediment	A series of graphs showing runoff, rainfall, and sediment for Goodwin Creek Watershed for the period of record (1982-1993).
(E) Surveys	A series of graphs showing surveys that have been conducted on Goodwin Creek for the period of record (1977-1993).

Screen Show Menu -- continued	
Command	**Description**
(F) Soils	A graph showing the soils of Goodwin Creek Watershed
(G) Land use	A series of graphs showing the land use of Goodwin Creek Watershed for the period of record (1980-1993).
(H) Temperature (Air)	A series of graphs showing air temperatures for Goodwin Creek Watershed for the period of record (1982-1993).
(I) GIS	A series of digital images showing the Goodwin Creek Watershed**.**
(J) Exit	Returns the user to the Screen Show Menu.

Access the Goodwin Creek Database Menu

Command	Description	
(1) Report	Views the Goodwin Creek Report Allows the user to view, print or copy a specified section(s) of the report or the entire report. When finished viewing a section of the report, the user is given the option to continue viewing or exiting to the Access the Goodwin Creek Database Menu.	
(2) Database	Presents menu of available types of data (1) Runoff (2) Sediment (3) Rainfall (4) Land use (5) Survey	
	(1) Runoff	User specifies the station number, date, runoff, sediment, or both. Once specified, the user is given the option of viewing, printing, copying the specified data to a file or exiting to the Access Menu. The data is presented as: Time (m,d,y) Stage (ft) Shift Runoff Rate Runoff (int) Accum. Runoff (inches) (cfs)
	(2) Sediment	User specifies the station number, date, runoff, sediment, or both. Once specified, the user is given the option of viewing, printing, copying the specified data to a file or exiting to the Access Menu. The data is presented as: Time (m,d,y) Stage (ft) Shift Sediment (tons) Accum. Sediment (tons) Concen. (tons/acre) (ppm)

Access the Goodwin Creek Database Menu -- continued		
Command	**Description**	
	(3) Rainfall	User specifies the station number and time. Once specified, the user is given the option of viewing, printing, copying the specified data to a file or exiting to the Access Menu. The data is presented as: Station # Time(m,d,y) Time(hr., min.) Amount (inches)
	(4) Land use	User specifies the water year (1980, 1982-1993). The user is given the option of viewing, printing, copying the specific data to a file or exiting to the Access Menu. The data is presented as: contributing and non-contributing acreage for cultivated, idle land, pasture, forest, & planted forest.
	(5) Survey	User specifies the channel cross-section survey set(s) (A, B, 1-24). Once specified, the data is shown on the screen and the user is given the option of continued viewing, printing, copying the specified data to a file or exiting to the Access Menu.
(3) Exit	Exits the user to the Main Menu	

ERDAS GIS Files*

Geographic Information System (.GIS) file. This is a single band image file, usually containing data file values that correspond to GIS classes. The file was created by a supervised classification program entitled MAXCLAS.

The format for each GIS file contains a header record, followed by the image data. The image data are arranged in a Band Interleaved by Line (BIL) format. Each file is virtually unlimited in size - the file structure allows up to 274 billion bytes. The only size constraint is the capacity of the particular storage medium.

The file consists of 512-byte records. The first 128 bytes of the first record contains the header information which consists of the following:

Name	Byte(s)	Description
HDWORD	1:6	A 6 byte array containing 'HEAD75'.
IPACK	7:8	An integer value which indicates the pack type of the data: 0= 8 bit, 1= 4 bit, 2 = 16 bit.

NBANDS	9:10	An integer that indicates number of bands/channels per line. (Always 1 for GIS.)
	11:16	Unused.
ICOLS	17:20	An integer*4 number specifying the width of the file in lines of pixels.
IROWS	21:24	An integer*4 number specifying the length of the file in lines of pixels.
XSTART	25:28	An integer*4 number specifying the data base x-coordinate of the first pixel (upper left) in the file.
YSTART	29:32	An integer*4 number specifying the data base y-coordinate of the first pixel (upper left) in the file.
	33:88	Unused.
MAPTYP	89:90	An integer, which indicates the type of map units, associated with the file.
NCLASS	91:92	An integer, which indicates the number of classes in the data, set.
	93:106	Unused.
IAUTYP	107:108	An integer which indicates the unit of area associated with each pixel: 0 = None, 1 = Acre, 2 = Hectare, 3 = Other.
ACRE	109:112	A real number, which specifies the number of area units, represented by each pixel, in the units given in IAUTYP.
XMAP	113:116	A real number, which gives the map, x-coordinate for the center of the upper left corner pixel in the file.
YMAP	117:120	A real number, which gives the map, y-coordinate for the center of the upper left corner pixel in the file.
XCELL	121:124	A real number which gives the x size of each pixel. Units depend upon the map type specified in MAPTYP: State Plane = feet Lat/Lon = degrees all others = meters. XCELL is 0 if MAPTYP is "none."
YCELL	125:128	A real number which gives the y size of each pixel, in the same units as XCELL.

Data file values begin at byte 129, and cross over record boundaries as necessary. The data are arranged in the following order:

where
x = the number of columns,
y = the number of lines (rows), and
n = the number of bands,

Pixels 1 through x of line 1, band 1
Pixels 1 through x of line 1, band 2
Pixels 1 through x of line 1, band 3
.....
Pixels 1 through x of line 1, band n

Pixels 1 through x of line 2, band 1
Pixels 1 through x of line 2, band 2
Pixels 1 through x of line 2, band 3
.....
Pixels 1 through x of line 2, band n

Pixels 1 through x of line y, band 1
Pixels 1 through x of line y, band 2
Pixels 1 through x of line y, band 3
.....
Pixels 1 through x of line y, band n

The pixel values may be packed in one of three ways: 4-bit or 8-bit. The 4-bit packing places two pixels per byte and 8-bit packing places one pixel per byte.

*Format as described by ERDAS, Inc., in the ERDAS Field Guide, Second Edition, Version 7.5, July 1991.

Precipitation Data Files

The files are data files. The files are a compilation of data that has been collected since 1981 on Goodwin Creek Watershed, Panola County, Mississippi. Each file contains the precipitation gage, time (date (month, day, year), hour and minute), and the collected precipitation. Additionally, the files are entitled PRECIP.0xx. The file extension of .0xx identifies the gage at which the data was collected. For example, .001 represents data collected at gage #1, .011 is for gage #11. There are 37 files (.001-.067) which represent the 37 precipitation gages located in and near Goodwin Creek Watershed. It is important to note that some gages have been discontinued since 1981 and are indicated by the absence of data (see Watershed Operations, Precipitation, section).

The format for each data file is ASCII (DOS) text. There is no heading for each column or header information attached to the beginning of each file. The files are arranged from left to right in a specific row and column for each measured value. A synopsis of the data location (row and column) is given below with an appropriate heading, column and description:

Heading	Column*	Description
Precipitation Gage	2-3	Defines the precipitation gage by number (see Watershed Operations section for location).
Date	8-9	Month
	10-11	Day
	12-13	Year
Time	14-17	Time of day when measurement was taken; all times are recorded in military time (0:00-24:00) in the Central Time Zone (cst).
Precipitation	18-21	The amount of precipitation recorded for a storm event; values are given in hundredths of inches (0.00); example, 197=1.97 inches of precipitation

* columns not designated are unused (blank)

Runoff and Sediment Data Files

The files are data files. The files are a compilation of data that has been collected since 1981 on Goodwin Creek Watershed, Panola County, Mississippi. Each file contains the time (date (month, day, year), hour and minute), stage, shift, runoff rate (CFS and in/hr), runoff interval, accumulated runoff (CFS and inches), sediment (tons), accumulated sediment (tons and tons/acre), and concentration. Additionally, the files are entitled GCRO.0xx. The file extension of .0xx represents the station at which the data was collected. For example, .001 identifies data collected for station #1, .011 is for station #11. There are fourteen files (.001-.014) which represent the 14 subwatersheds in Goodwin Creek.

The format for each data file is ASCII (DOS) text. There is no heading for each column or header information attached to the beginning of each file. The files are arranged from left to right in a specific row and column for each measured value. A synopsis of the data location (row and column) is given below with an appropriate heading, column and description:

Heading	Column*	Description
Date	2-3 5-6 8-9	Month Day Year
Time	11-14	Time of day when measurement was taken; all times are recorded in military time (0:00-24:00) in the Central Time Zone (cst).
Stage	17-21	The flow measured through the flume structure (in feet) by one-minute time intervals; the vertical height above the invert elevation of the flume at the stilling well section.
Shift	25-28	Error correction for stage readings measured in feet; it is used for both the stage and runoff measurements.
Runoff Rate	32-38	The amount of flow through the flume; measured in cubic feet per second (CFS).
Runoff Rate	43-48	The amount of flow through the flume; measured in inches per hour (in/hr).
Runoff (interval)	53-58	The runoff between 2 break points (interval--change in stage measurements); measured in cubic feet per second (CFS)-Days
Accumulated Runoff	62-68	The summation of runoff volumes from the runoff interval measurements; measured in cubic feet per second (CFS)
Accumulated Runoff	73-78	The summation of runoff volumes from the runoff interval measurements; measured in inches.
Sediment	83-88	Amount of sediment (fines, only, < 0.062

(interval)		mm) measured through the flumes; measured in tons.
Accumulated Sediment	92-98	The summation of each sediment quantity for each interval, measured in tons.
Accumulated Sediment	103-108	The summation of each sediment quantity divided by the watershed area (acres) each station drains; given in tons per acre (tons/acre).
Concentration	112-116	The amount of fine sediment based on the specific time measured, not interval; measured in parts per million. (ppm)

* columns not designated are unused (blank)

Survey Data Files

The files are data files. The files are a compilation of primarily cross section survey data that has been collected since 1977 on Goodwin Creek Watershed, Panola County, Mississippi. There are 29 sets of cross section files (A, B, C, 1-26) for Goodwin Creek. Each file contains the cross-section codes, current and corrected horizontal distance, elevation, point coordinates in Mississippi State Plane West (feet) (northing and easting), and point description. Additionally, the files are entitled SURxx.dat. The file name identifies the survey number (see survey section of report). For example, SUR0A.DAT represents the original 1977 survey by the Corps of Engineers and SUR01-26.DAT identifies the cross-sections taken by the USDA-ARS-NSL, number 1-26.

The format for each data file is ASCII (DOS) text. At the beginning of each set of cross section data, the file contains a header describing the survey number and survey date. The files are arranged from left to right in a specific row and column for each measured value. A synopsis of the data location (row and column) is given below with an appropriate heading, column and description:

Heading	Column*	Description
Header	1-34	Used to describe the survey by series and date.
Cross-Section Code	1-4	Coding used to identify each cross-section.
Current Horizontal Distance	10-15	Current horizontal distance from 0.0 at original left monument ('-' towards bank, '+' towards stream).
Corrected Horizontal Distance	16-21	Corrected horizontal distance from original left monument ('-' towards bank, '+' towards stream).
Elevation (MSL)	23-28	Elevation of point in feet measured at mean sea level (MSL).
Y coordinate of point	30-39	Northing (y) component of coordinate; Mississippi State Plane West, NAD27, feet.
X coordinate of point	42-50	Easting (x) component of coordinate; Mississippi State Plane West, NAD27, feet.
Point Code	54-80	Comments describing point.

* columns not designated are not used (blank)

APPENDIX F

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APPENDIX G

Goodwin Creek - Related Publications
Reports, Journal Papers and Conference Proceedings

GOODWIN CREEK - RELATED PUBLICATIONS
REPORTS, JOURNAL PAPERS AND CONFERENCE PROCEEDINGS

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