

INDUSTRIAL AREA IM/IRA SURFACE WATER MONITORING

MONTHLY STATUS REPORT

MAY 1995

U.S. DEPARTMENT OF ENERGY

Rocky Flats Plant

Golden, Colorado

ENVIRONMENTAL PROTECTION MANAGEMENT DEPARTMENT

SURFACE WATER

June 28, 1995

ADMIN RECORD

IA-A-002976

~~1~~
58

1. INTRODUCTION	1-1
2. HIGHLIGHTS	2-1
3. DATA SUMMARY	3-1
3.1 Tier 1: Industrial Area Outfalls	3-1
3.1.1 Gaging Station GS10	3-1
Discharge Data	3-2
Analytical Results	3-4
3.1.2 Gaging Station GS21	3-5
Discharge Data	3-6
Analytical Results	3-8
3.1.3 Gaging Station GS22	3-9
Discharge Data	3-10
Analytical Results	3-12
3.1.4 Gaging Station GS23	3-13
Discharge Data	3-14
Analytical Results	3-15
3.1.5 Gaging Station GS24	3-16
Discharge Data	3-17
Analytical Results	3-19
3.1.6 Gaging Station GS25	3-20
Discharge Data	3-21
Analytical Results	3-23
3.1.7 Gaging Station SW022	3-24
Discharge Data	3-25
Analytical Results	3-27
3.1.8 Gaging Station SW027	3-28
Discharge Data	3-29
Analytical Results	3-31
3.1.9 Gaging Station SW091	3-32
Discharge Data	3-33
Analytical Results	3-35
3.1.10 Gaging Station SW093	3-36
Discharge Data	3-37
Analytical Results	3-39
3.1.11 Gaging Station SW998	3-40
Discharge Data	3-41
Analytical Results	3-43
3.2 Tier II: D&D Subbasin Outfalls	3-44
3.2.1 Gaging Station GS27	3-44
Discharge Data	3-45
Analytical Results	3-47
3.2.2 Gaging Station GS28	3-48
Discharge Data	3-49
Analytical Results	3-51

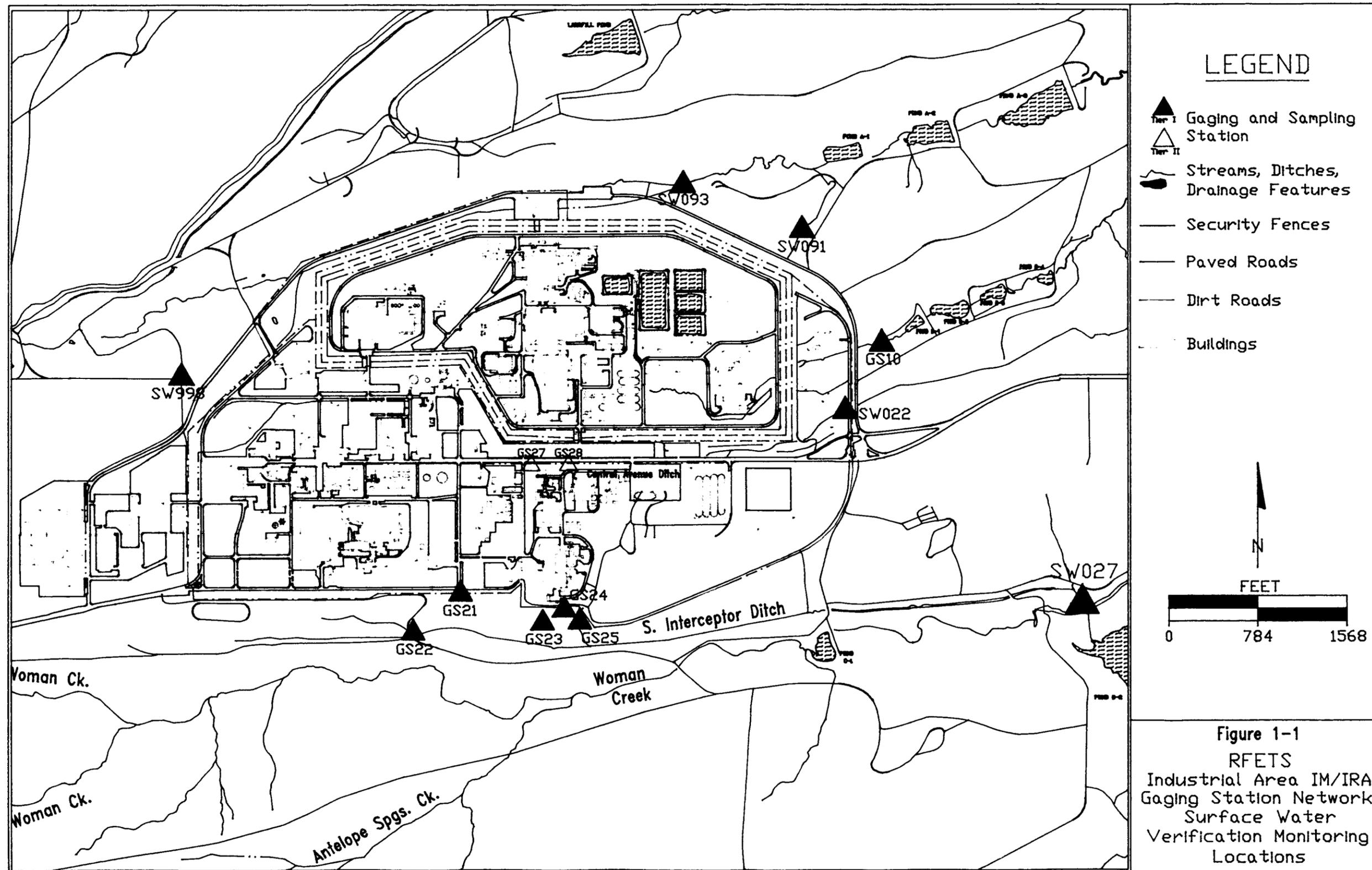
1. INTRODUCTION

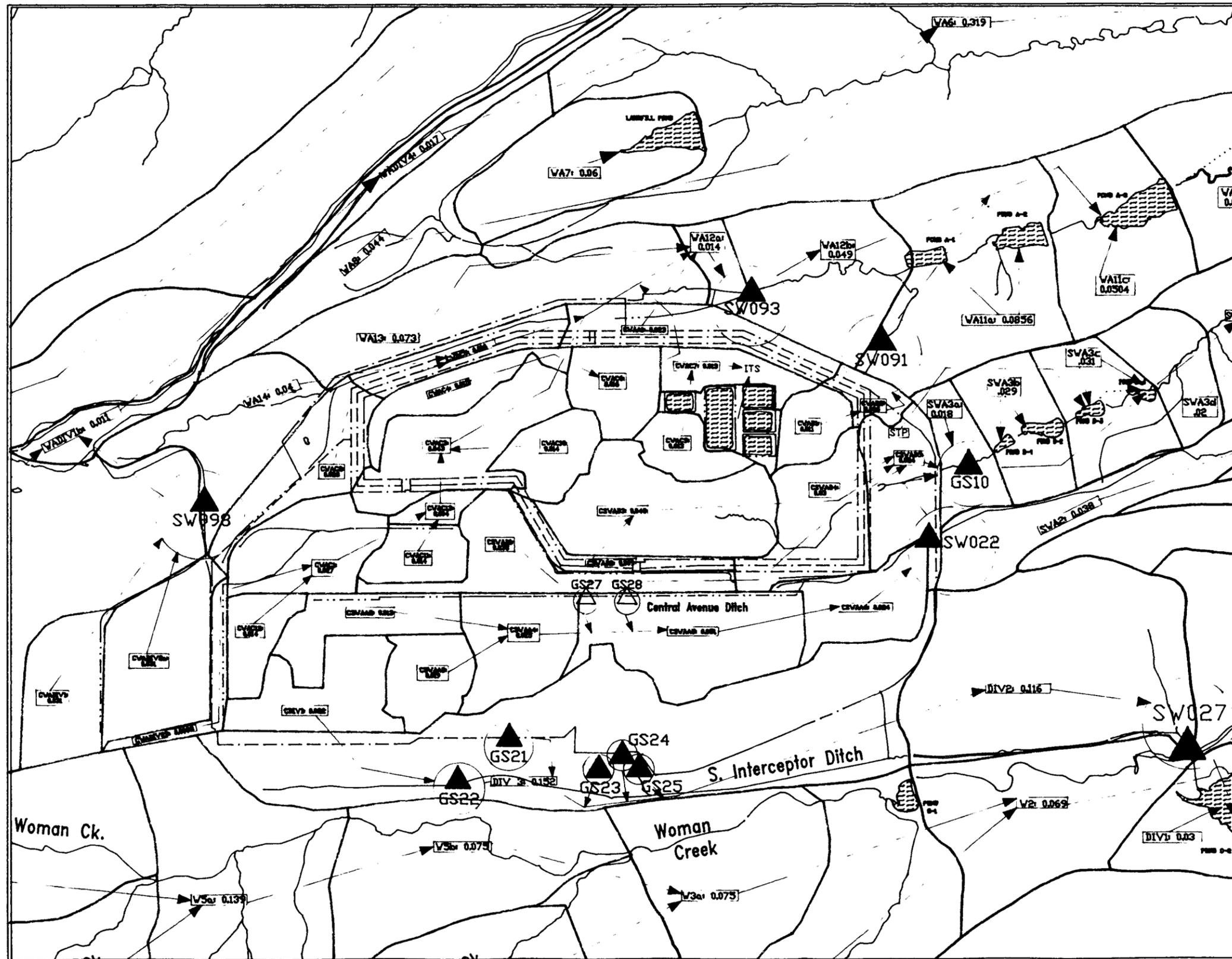
The Interim Measure/Interim Remedial Action/Decision Document (IM/IRA/DD) for the Industrial Area at the Rocky Flats Environmental Technology Site (RFETS) was prepared in accordance with the Rocky Flats Plant Interagency Agreement (IAG), dated January 22, 1991, and applicable regulatory guidance documents. The objective of the Industrial Area IM/IRA/DD is to ensure that environmental monitoring is adequate to support decontamination and decommissioning (D&D) and other nonroutine activities within the Industrial Area at RFETS. To achieve this objective, a monitoring safety net approach is used around the RFETS Industrial Area to monitor for, protect against, and respond to any actual or potential contaminant releases.

The following elements relating to surface water monitoring are detailed in the IM/IRA/DD:

- Surface water monitoring in areas of concern, which previously focused on the terminal ponds (and other sites in the Buffer Zone), will be expanded to include the Industrial Area.
- Surface water quality and hydraulic flow conditions will be studied in the Industrial Area to establish baseline conditions.
- Monitoring systems for air and surface water use state-of-the-art technologies to accomplish plant transition monitoring objectives. Technical improvements for monitoring building D&D and Transition activities will be reviewed regularly in an attempt to improve air and surface water monitoring capabilities.
- Verification monitoring for D&D and Transition activities is the second and outer layer of environmental surveillance that will verify that contaminant pathway protection procedures and site-specific monitoring activities are effective.
- The type and extent of verification monitoring will depend on the type of activity being performed and the assessed environmental hazard associated with that activity.
- A statistically based methodology has been identified to develop site-specific baseline conditions for environmental media at activity locations and to determine when pre-programmed response actions are needed.

EG&G, Environmental Protection Department, Surface Water is responsible for the implementation of surface water monitoring activities required by the Industrial Area IM/IRA/DD. The report contained herein provides a monthly summary of the highlights and analytical results of this activity for the month of May 1995. Figure 1-1 shows the location surface water monitoring sites discussed in this report. Figure 1-2 shows the Industrial Area subbasins and hydrologic routing. Figure 1-3 shows a close-up of gaging stations GS27 and GS28 which support D&D and Transition operations at Building 889 and the Industrial Area IM/IRA Pilot Project.





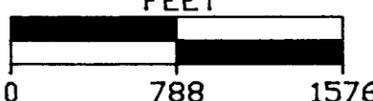
LEGEND

-  Tier I Gaging and Sampling Station
-  Tier II Gaging and Sampling Station
-  Streams, Ditches, Drainage Features
-  Security Fences
-  Basin Boundaries
-  Basin Areas (sq. mi.)
-  Natural Discharge
-  Controlled Transfers and Discharges



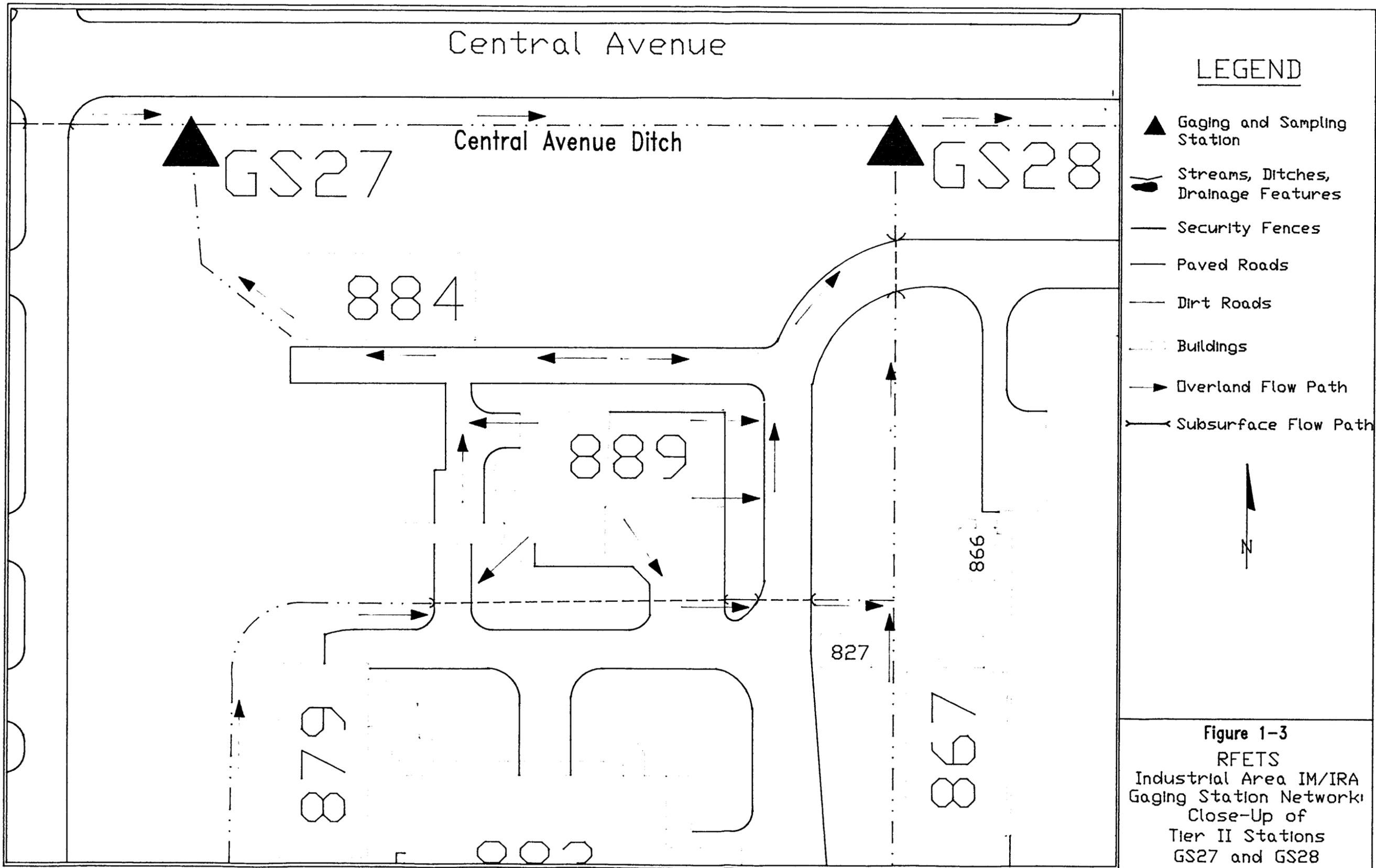
N

FEET



0 788 1576

Figure 1-2
 RFETS
 Industrial Area IM/IRA
 Gaging Station Network
 Surface Water
 Routing Diagram



2. HIGHLIGHTS

The following activities occurred during the period from March 1, 1995 to March 31, 1995:

- A 0.5 foot H-flume was installed at gaging station GS24. The flume was subsequently equipped with a bubbler flow meter, a dedicated DC solar power system, and automated water quality samplers.
- On May 3, stormwater samples were collected at gaging stations GS25, SW022, and GS24.
- A Hydrolab Recorder water quality probe was installed at gaging station GS27. Troubleshooting is ongoing, and the probe is expected to be up and running by July 1.
- On May 16-17, 1995 the Site received approximately 3.4" of precipitation. The resulting runoff exceeded the capacity of all but one flume (GS25). However, stormwater samples were successfully collected at all but one site (GS27: power failure). The exceptionally high runoff volumes damaged equipment at SW093, SW091, GS10, SW022, and SW027. All equipment was quickly repaired and the network was fully operational by Noon on May 18, 1995.
- A stormwater sample was collected at gaging station GS27 on May 23, 1995.
- Stormwater samples were collected at gaging stations SW093, SW091, GS10, and SW027 on May 26, 1995.
- Stormwater samples were collected at gaging stations SW022, GS21, GS10, and GS22 on May 31, 1995.

3. DATA SUMMARY

All discharge data provided in Monthly Status Reports are **preliminary and subject to revision**. Final data will be delivered in the Annual Report.

3.1 Tier 1: Industrial Area Outfalls

The objective of the Tier I Industrial Area gaging stations is to monitor and characterize surface water leaving the Industrial Area and determine if D&D and Transition activities have impacted surface water. These gaging stations monitor six (6) of the seven (7) major pathways discussed in the Industrial Area IM/IRA/DD and 5 culverts on the 81 Hillside.

3.1.1 Gaging Station GS10

Location:

- 39° 53' 35.11"N 105° 11' 26.6"W
- South Walnut Creek, above the Pond B-1 Bypass; co-located with SW023

Drainage Characteristics:

- Pathway 2
- Total and Effective Area: $0.281 \text{ mi.}^2 = 179.8 \text{ ac}$ (approximately 78% impervious)
- Sub-basins: CSWAB1, CSWAB2, CSWAB3, CSWAB4, CSWAB5, CSWAA2, CSWAA3, CSWAA4, CSWAA5, CSWAA6 (Figure 1-2)
- Description: GS10 lies on South Walnut Creek just above the B-1 Bypass. The basin consists of the central and southern area of the Industrial Area (total of 140ac 100% impervious).
- Areas draining to this site: 900, 800, 700, 600, 500, 400, 300, 100

Hardware Configuration:

- Primary Device: 9½" Parshall flume
- Flow Meter: ISCO® Model 3230 (bubbler)
- Sampler: ISCO® Model 3700R Refrigerated
- Radio Telemetry: No
- Power: DC solar power system
- Water Quality Parameters: None

Discharge Data

Table 3-1. GS10 Mean Daily Discharge Data

Date	Mean CFS	Min. CFS	Max. CFS	Discharge
5/1/95	0.316	0.222	0.683	27262
5/2/95	0.388	0.168	2.317	33531
5/3/95	0.662	0.221	2.416	57229
5/4/95	0.384	0.236	1.424	33150
5/5/95	0.185	0.162	0.222	16000
5/6/95	0.156	0.146	0.173	13510
5/7/95	0.147	0.142	0.156	12690
5/8/95	0.182	0.131	0.494	15716
5/9/95	0.132	0.121	0.282	11440
5/10/95	0.123	0.118	0.129	10594
5/11/95	0.129	0.121	0.168	11113
5/12/95	0.146	0.115	0.404	12587
5/13/95	0.147	0.108	0.445	12661
5/14/95	0.125	0.110	0.231	10829
5/15/95	0.151	0.112	0.480	13020
5/16/95	0.857	0.115	9.400	74014
5/17/95	5.327	0.727	29.702	460245
5/18/95	0.634	0.412	1.725	54795
5/19/95	0.342	0.280	0.996	29513
5/20/95	0.265	0.242	0.309	22928
5/21/95	0.238	0.226	0.251	20584
5/22/95	0.258	0.200	0.606	22316
5/23/95	1.544	0.320	4.853	133420
5/24/95	1.077	0.494	2.614	93055
5/25/95	0.562	0.393	1.243	48519
5/26/95	1.079	0.334	11.492	93192
5/27/95	1.755	0.633	9.366	151673
5/28/95	2.041	0.602	10.480	176382
5/29/95	1.093	0.812	2.033	94473
5/30/95	1.063	0.770	2.545	91877
5/31/95	1.124	0.697	4.594	97071
Monthly Values				
Mean	0.730	0.306	3.298	63077
Min.	0.123	0.108	0.129	10594
Max.	5.327	0.812	29.702	460245

Total Discharge: 1955389 Cubic Feet

KEY: BD = bad data; *italics* = estimated data from field observations and discharge record at adjacent gages

Bad data can be attributed to equipment failures and winter freezing conditions.

Figure 3-1. GS10 Monthly Discharge

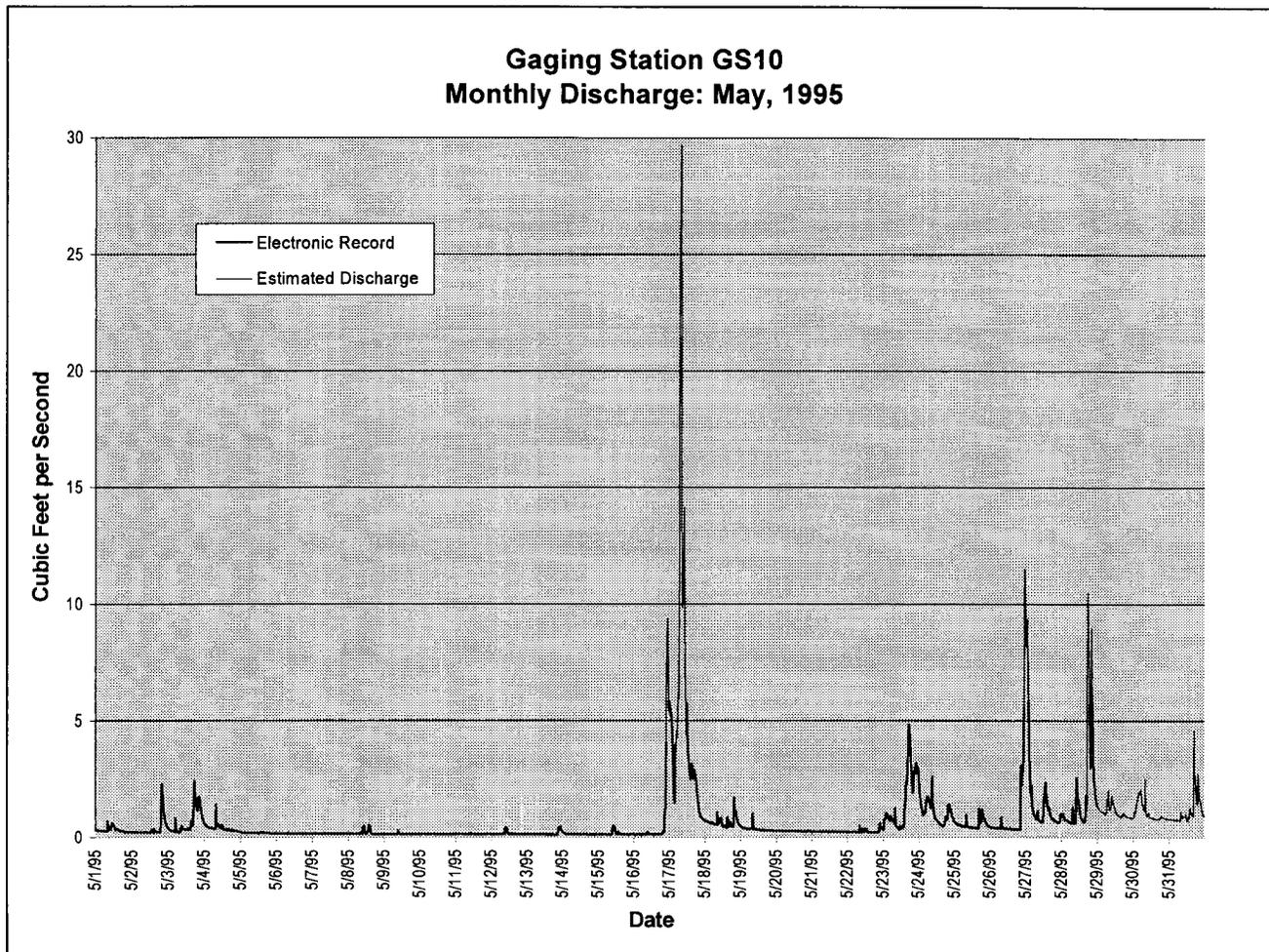
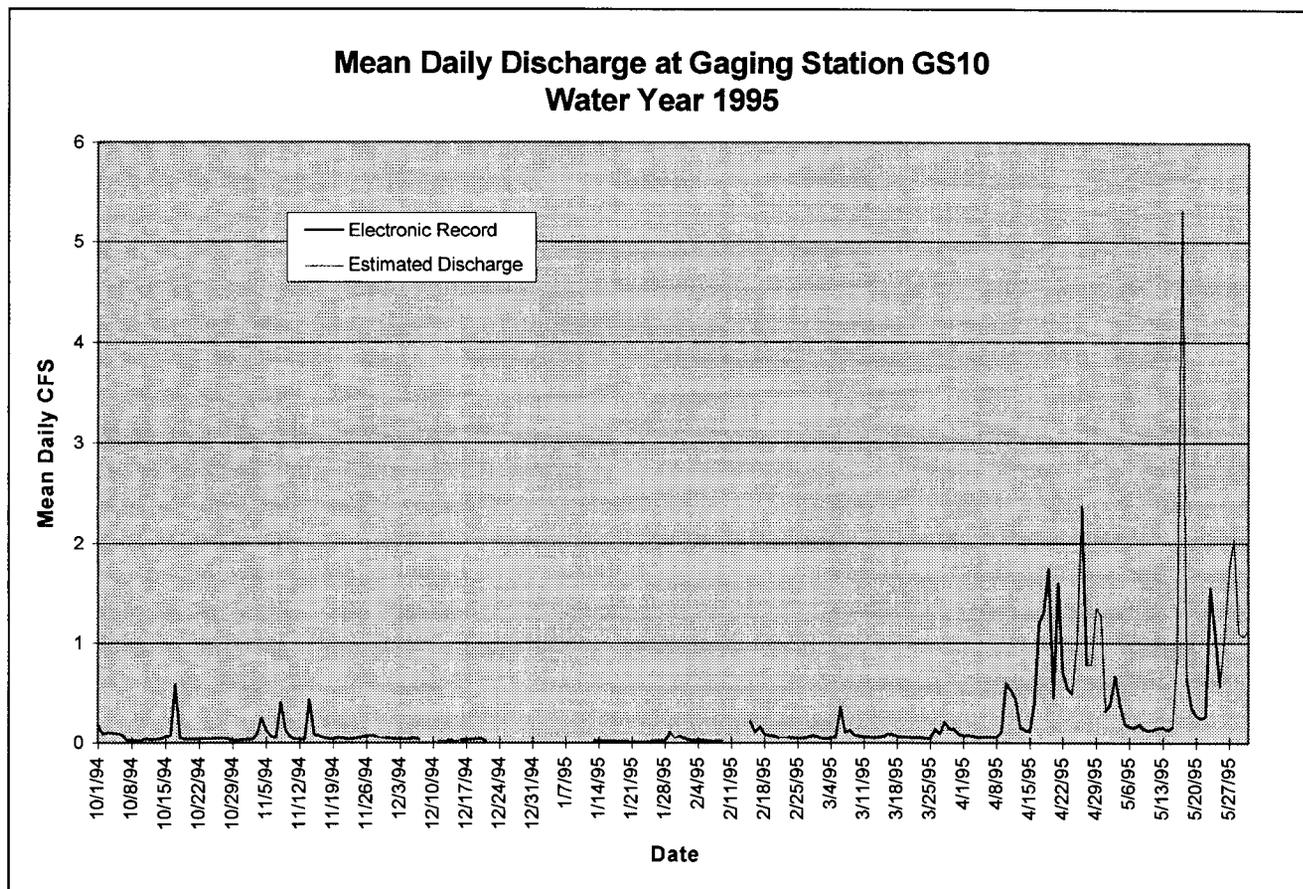


Figure 3-2. GS10 Mean Daily Discharge, Water Year 1995



Analytical Results

No analytical results compiled to date.

3.1.2 Gaging Station GS21

Location:

- State Plane: 2083061; 748147
- concrete spillway near intersection of Seventh St. and Cactus Avenue

Drainage Characteristics:

- Pathway 5
- Buildings: T664A, 664
- Sub-basins: DIV3 (Figure 1-2)
- Description: GS21 lies on the concrete spillway near intersection of Seventh St. and Cactus Avenue, at the southwest corner of the 850 parking lot. This basin receives Industrial Area runoff principally from the roads, parking lots and storage area south of Building 664.

Hardware Configuration:

- Primary Device: 4" cutthroat flume
- Flow Meter: ISCO 4230 bubbler
- Sampler: ISCO 3710 Automatic
ISCO 6000 Automatic VOC
- Radio Telemetry: Yes
- Power: DC solar power system
- Precipitation: ISCO Rain Gage
- Water Quality Parameters: None

Discharge Data

Table 3-2. GS21 Mean Daily Discharge Data

Date	Mean CFS	Min. CFS	Max. CFS	Discharge
5/1/95	0.007	0.005	0.007	571
5/2/95	0.007	0.001	0.212	599
5/3/95	0.010	0.001	0.090	829
5/4/95	0.002	0.001	0.005	176
5/5/95	0.000	0.000	0.001	30
5/6/95	0.000	0.000	0.000	0
5/7/95	0.000	0.000	0.000	0
5/8/95	0.000	0.000	0.000	0
5/9/95	0.000	0.000	0.000	0
5/10/95	0.000	0.000	0.000	0
5/11/95	0.000	0.000	0.000	0
5/12/95	0.000	0.000	0.000	0
5/13/95	0.001	0.000	0.012	74
5/14/95	0.001	0.000	0.004	66
5/15/95	0.000	0.000	0.000	0
5/16/95	0.021	0.000	0.323	1807
5/17/95	<i>0.347</i>	<i>0.003</i>	<i>1.725</i>	29944
5/18/95	0.012	0.000	0.376	1027
5/19/95	0.002	0.001	0.004	155
5/20/95	0.001	0.000	0.003	59
5/21/95	0.000	0.000	0.001	20
5/22/95	0.001	0.000	0.020	68
5/23/95	0.049	0.000	0.235	4251
5/24/95	0.022	0.002	0.060	1943
5/25/95	0.007	0.001	0.063	563
5/26/95	0.032	0.001	0.553	2792
5/27/95	0.040	0.002	0.381	3443
5/28/95	0.050	0.002	0.470	4328
5/29/95	0.012	0.002	0.107	1055
5/30/95	0.010	0.001	0.052	859
5/31/95	0.012	0.001	0.231	1010
Monthly Values				
Mean	0.021	0.001	0.159	1796
Min.	0.000	0.000	0.000	0
Max.	0.347	0.005	1.725	29944

Total Discharge: 55668 Cubic Feet

KEY: BD = bad data; *italics* = estimated data from field observations and discharge record at adjacent gages

Bad data can be attributed to equipment failures and winter freezing conditions.

Figure 3-3. GS21 Monthly Discharge

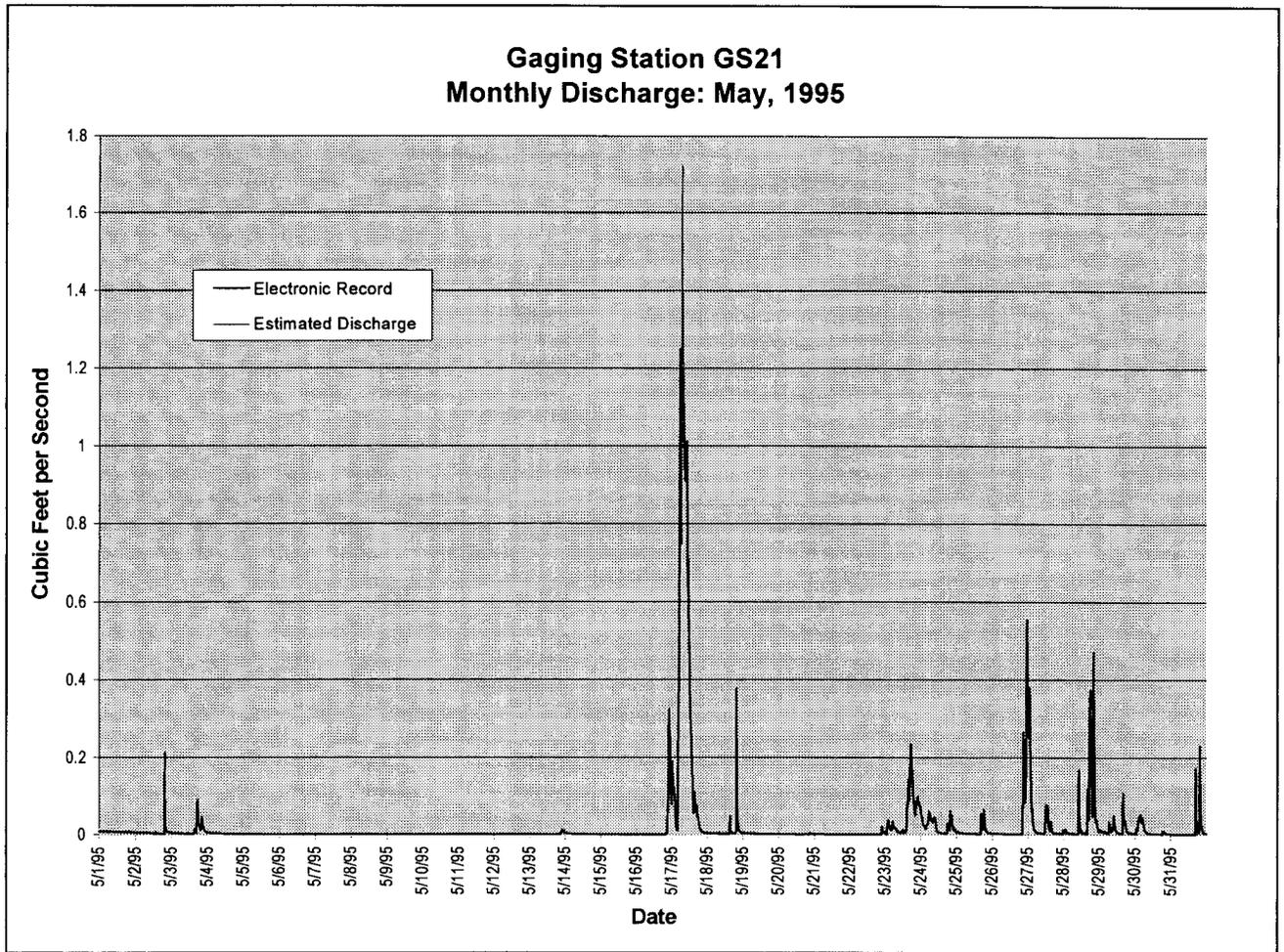
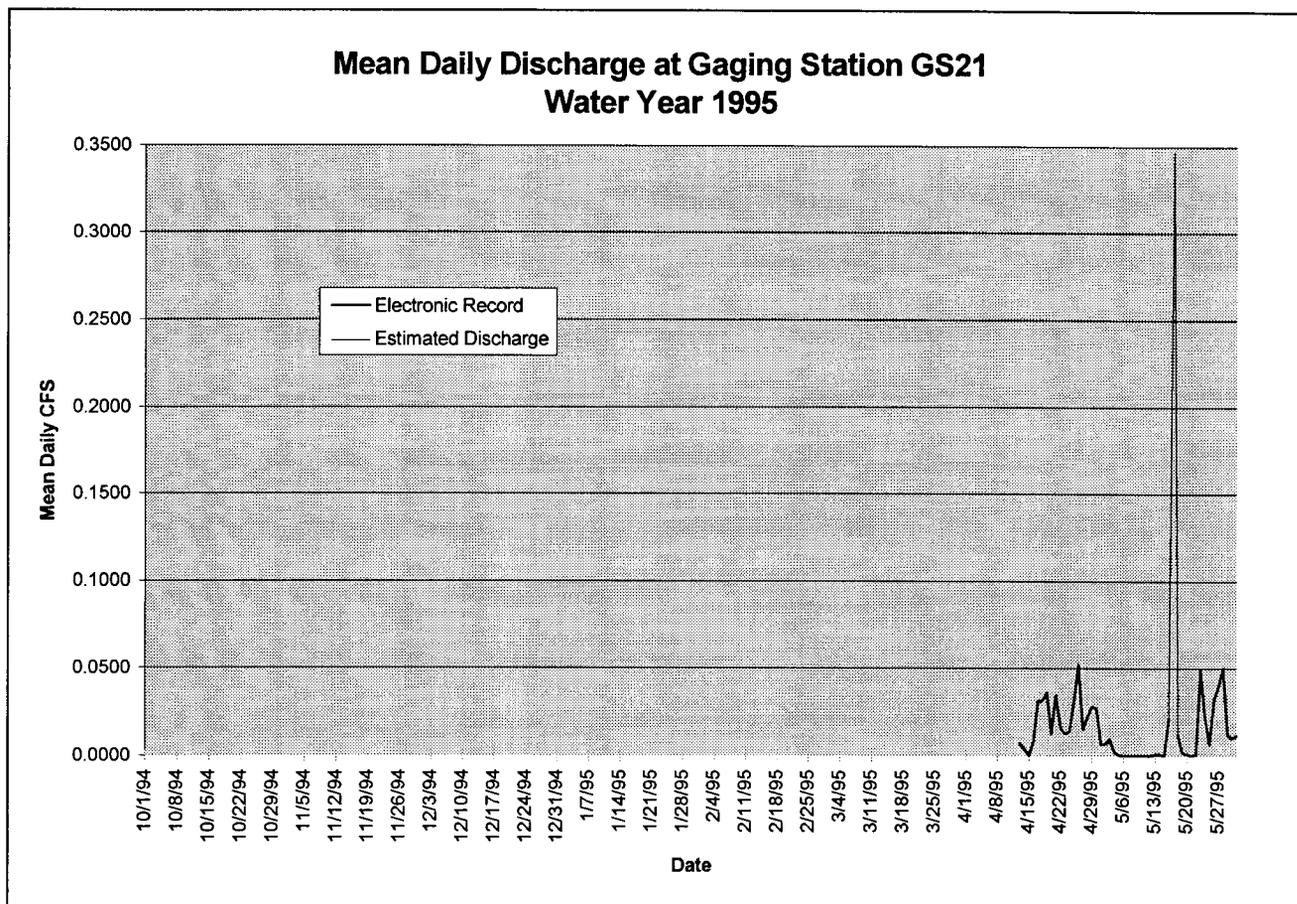


Figure 3-4. GS21 Mean Daily Discharge, Water Year 1995



Analytical Results

No analytical results compiled to date.

3.1.3 Gaging Station GS22

Location:

- State Plane: 2082646; 747799
- concrete apron at 400 Area outfall to SID

Drainage Characteristics:

- Pathway 5
- Buildings: T124A, 440, 444, T444A, 447, 451, 457, 460, 461, 462
- Sub-basins: CDIV1 (Figure 1-2)
- Description: GS22 lies at the concrete apron at the 400 Area outfall to the SID. This basin receives Industrial Area runoff principally from the roads, parking lots and buildings of the 400 Area.

Hardware Configuration:

- Primary Device: 1.5 foot H flume
- Flow Meter: ISCO 4230 bubbler
- Sampler: ISCO 3710 Automatic
ISCO 6000 Automatic VOC
- Radio Telemetry: No
- Power: DC solar power system
- Water Quality Parameters: None

Discharge Data

Table 3-3. GS22 Mean Daily Discharge Data

Date	Mean CFS	Min. CFS	Max. CFS	Discharge
5/1/95	0.038	0.036	0.061	3298
5/2/95	0.088	0.033	2.612	7629
5/3/95	0.167	0.032	1.699	14464
5/4/95	0.058	0.030	0.419	5015
5/5/95	0.034	0.030	0.121	2959
5/6/95	0.030	0.028	0.050	2611
5/7/95	0.030	0.028	0.069	2613
5/8/95	0.033	0.026	0.091	2814
5/9/95	0.026	0.025	0.027	2208
5/10/95	0.027	0.024	0.126	2356
5/11/95	0.027	0.024	0.056	2307
5/12/95	0.026	0.024	0.067	2228
5/13/95	0.067	0.021	0.528	5774
5/14/95	0.026	0.021	0.097	2273
5/15/95	0.022	0.020	0.037	1860
5/16/95	0.265	0.019	3.468	22854
5/17/95	1.877	0.060	8.333	162158
5/18/95	0.134	0.035	3.863	11559
5/19/95	0.028	0.017	0.048	2445
5/20/95	0.039	0.010	0.268	3338
5/21/95	0.047	0.038	0.075	4097
5/22/95	0.061	0.030	0.571	5307
5/23/95	0.427	0.010	1.921	36896
5/24/95	0.270	0.044	1.061	23305
5/25/95	0.107	0.040	1.350	9248
5/26/95	0.281	0.037	3.851	24291
5/27/95	0.330	0.048	2.857	28481
5/28/95	0.395	0.043	3.761	34157
5/29/95	0.152	0.053	0.964	13139
5/30/95	0.129	0.047	0.478	11166
5/31/95	0.135	0.041	2.771	11635
Monthly Values				
Mean	0.173	0.031	1.345	14983
Min.	0.022	0.010	0.027	1860
Max.	1.877	0.060	8.333	162158

Total Discharge: 464485 Cubic Feet

KEY: BD = bad data; *italics* = estimated data from field observations and discharge record at adjacent gages

Bad data can be attributed to equipment failures and winter freezing conditions.

Figure 3-5. GS22 Monthly Discharge

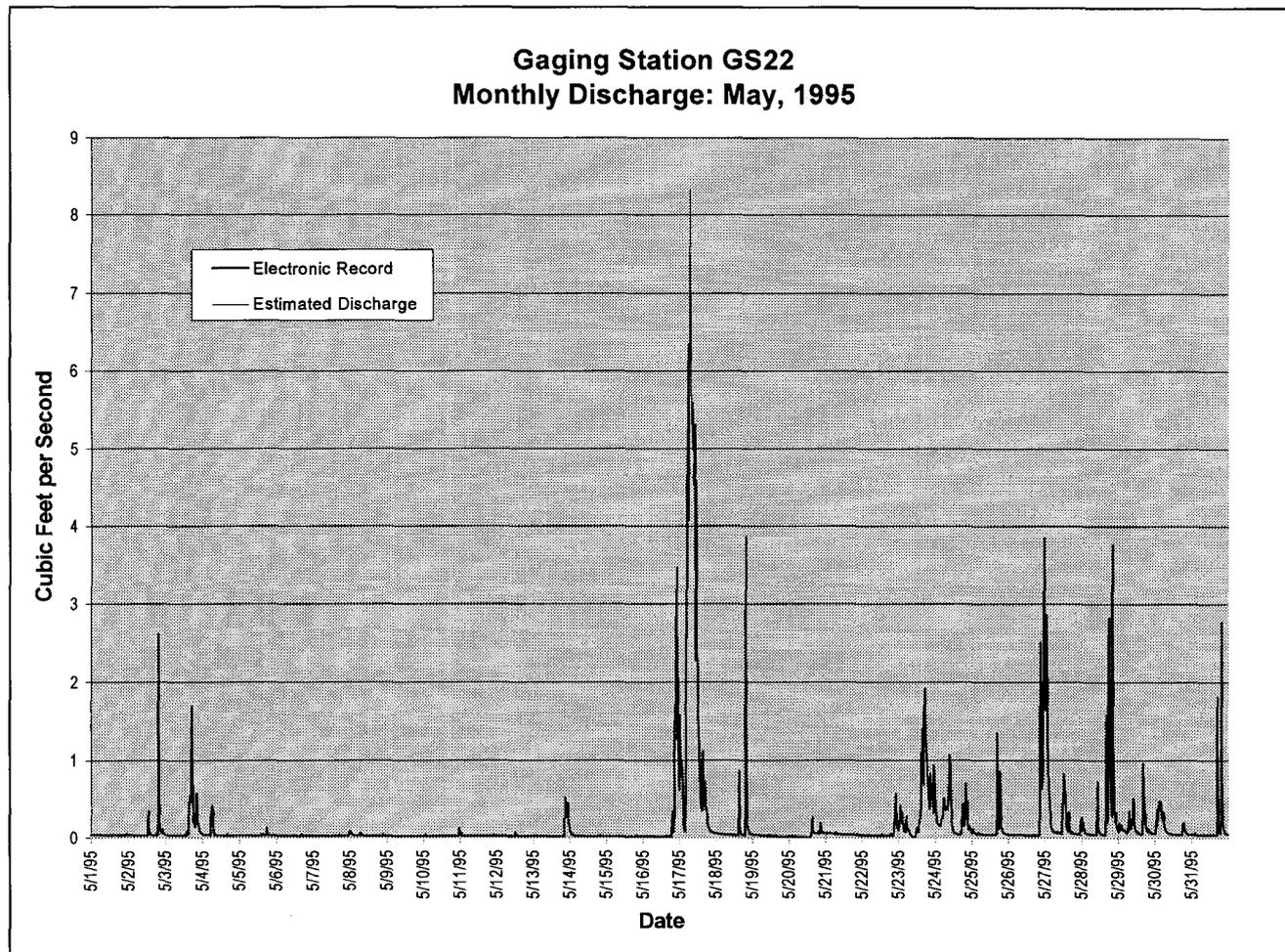
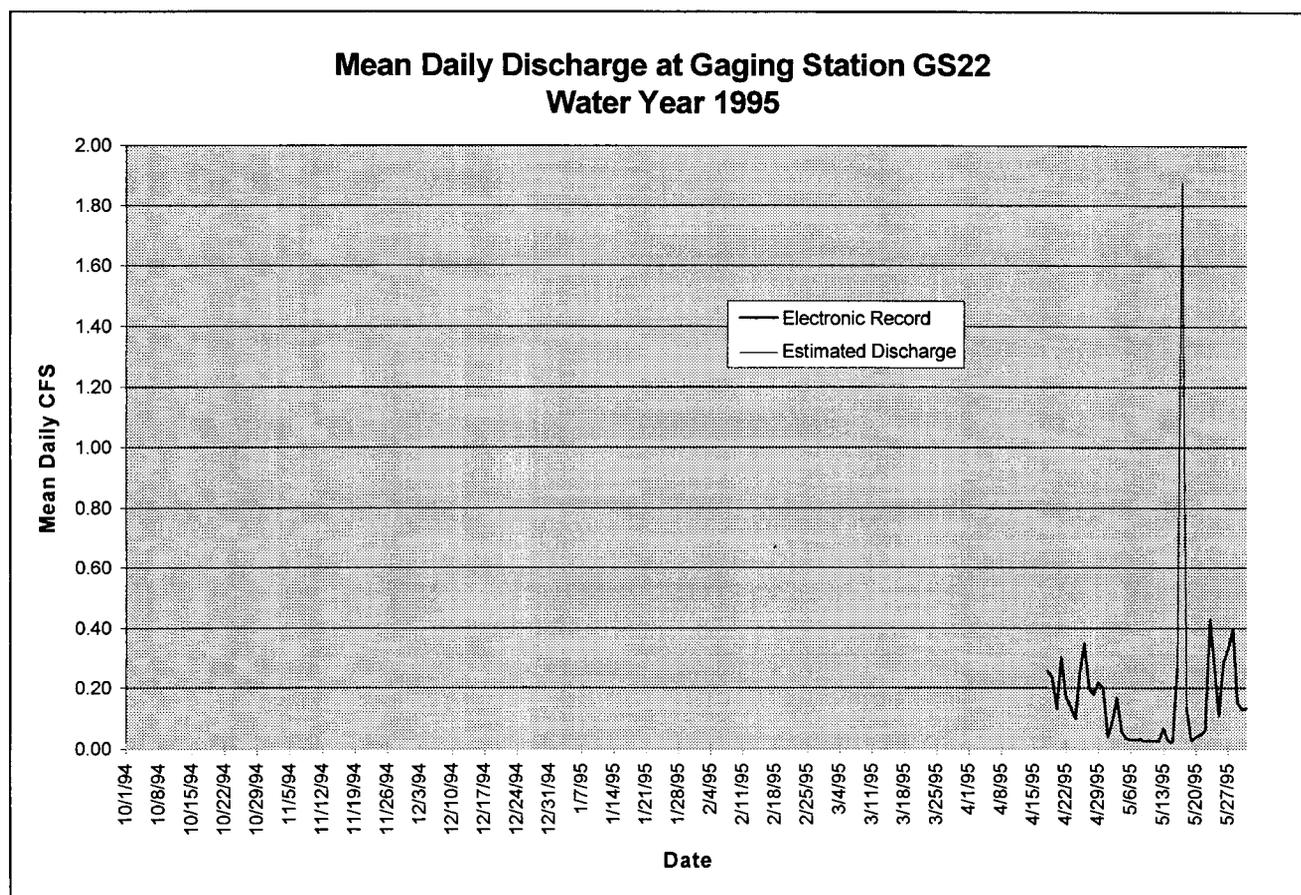


Figure 3-6. GS22 Mean Daily Discharge, Water Year 1995



Analytical Results

No analytical results compiled to date.

3.1.4 Gaging Station GS23

Location:

- State Plane: 2083781; 747885
- Suspected Building 881 septic lift overflow outfall south of 881

Drainage Characteristics:

- Pathway 5
- Buildings: unknown surface water flow
- Sub-basins: unknown surface water contributions (Figure 1-2)
- Description: GS23 monitors a 5.5" metal pipe which outfalls on the hillside south of the southwest corner of Building 881. The pipe is thought to be the outfall for the overflow from the Bldg. 881 septic lift station. The sources of any surface water seen at this site are unknown.

Hardware Configuration:

- Primary Device: .6 foot HS flume
- Flow Meter: ISCO 4230 bubbler
- Sampler: ISCO 3710 Automatic
ISCO 6000 Automatic VOC
- Radio Telemetry: No
- Power: DC solar power system
- Water Quality Parameters: None

Discharge Data

Table 3-4. GS23 Mean Daily Discharge Data

Date	Mean CFS	Min. CFS	Max. CFS	Discharge
5/1/95	0.000	0.000	0.000	0
5/2/95	0.000	0.000	0.000	0
5/3/95	0.000	0.000	0.000	0
5/4/95	0.000	0.000	0.000	0
5/5/95	0.000	0.000	0.000	0
5/6/95	0.000	0.000	0.000	0
5/7/95	0.000	0.000	0.000	0
5/8/95	0.000	0.000	0.000	0
5/9/95	0.000	0.000	0.000	0
5/10/95	0.000	0.000	0.000	0
5/11/95	0.000	0.000	0.000	0
5/12/95	0.000	0.000	0.000	0
5/13/95	0.000	0.000	0.000	0
5/14/95	0.000	0.000	0.000	0
5/15/95	0.000	0.000	0.000	0
5/16/95	0.000	0.000	0.000	0
5/17/95	0.000	0.000	0.000	0
5/18/95	0.000	0.000	0.000	0
5/19/95	0.000	0.000	0.000	0
5/20/95	0.000	0.000	0.000	0
5/21/95	0.000	0.000	0.000	0
5/22/95	0.000	0.000	0.000	0
5/23/95	0.000	0.000	0.000	0
5/24/95	0.000	0.000	0.000	0
5/25/95	0.000	0.000	0.000	0
5/26/95	0.000	0.000	0.000	0
5/27/95	0.000	0.000	0.000	0
5/28/95	0.000	0.000	0.000	0
5/29/95	0.000	0.000	0.000	0
5/30/95	0.000	0.000	0.000	0
5/31/95	0.000	0.000	0.000	0
Monthly Values				
<i>Mean</i>	0.000	0.000	0.000	0
<i>Min.</i>	0.000	0.000	0.000	0
<i>Max.</i>	0.000	0.000	0.000	0

Total Discharge: 0 Cubic Feet

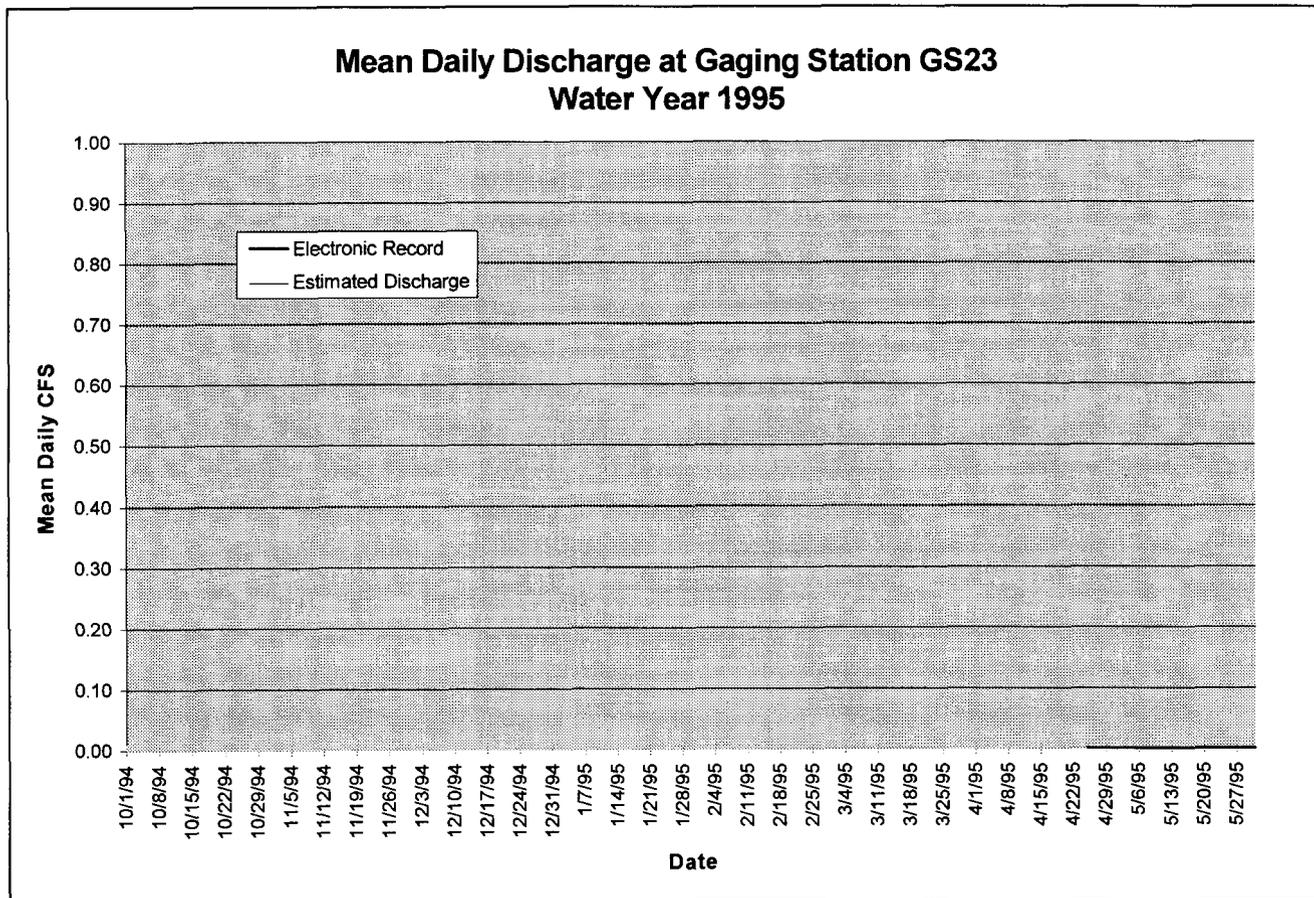
KEY: BD = bad data; *italics* = estimated data from field observations and discharge record at adjacent gages

Bad data can be attributed to equipment failures and winter freezing conditions.

Figure 3-7. GS23 Monthly Discharge

No discharge for May 1995.

Figure 3-8. GS23 Mean Daily Discharge, Water Year 1995



Analytical Results

No analytical results compiled to date.

3.1.5 Gaging Station GS24

Location:

- State Plane: 2083973; 747999
- 12" cmp south of 881

Drainage Characteristics:

- Pathway 5
- Buildings: 869, 881, T881G, 887, 885
- Sub-basins: DIV3 (Figure 1-2)
- Description: GS24 monitors a 12" cmp which outfalls on the hillside south of Building 881. Surface water originates as runoff from the areas south and west of Building 881.

Hardware Configuration:

- Primary Device: 0.5' H flume
- Flow Meter: ISCO 4230 bubbler
- Sampler: ISCO 3710 Automatic
ISCO 6000 Automatic VOC
- Radio Telemetry: No
- Power: DC solar power system
- Water Quality Parameters: None

Discharge Data

Table 3-5. GS24 Mean Daily Discharge Data

Date	Mean CFS	Min. CFS	Max. CFS	Discharge
5/1/95	0.000	0.000	0.000	0
5/2/95	0.002	0.000	0.108	165
5/3/95	0.003	0.000	0.051	294
5/4/95	0.000	0.000	0.001	5
5/5/95	0.000	0.000	0.000	0
5/6/95	0.000	0.000	0.000	0
5/7/95	0.000	0.000	0.000	0
5/8/95	0.000	0.000	0.000	0
5/9/95	0.000	0.000	0.000	0
5/10/95	0.000	0.000	0.034	36
5/11/95	0.000	0.000	0.000	0
5/12/95	0.000	0.000	0.000	0
5/13/95	0.000	0.000	0.000	0
5/14/95	0.000	0.000	0.000	0
5/15/95	0.000	0.000	0.000	0
5/16/95	0.013	0.000	0.190	1143
5/17/95	0.126	0.005	0.798	10861
5/18/95	0.005	0.000	0.146	463
5/19/95	0.000	0.000	0.001	9
5/20/95	0.000	0.000	0.000	0
5/21/95	0.000	0.000	0.000	0
5/22/95	0.000	0.000	0.009	29
5/23/95	0.025	0.001	0.101	2117
5/24/95	0.011	0.001	0.041	913
5/25/95	0.003	0.000	0.042	237
5/26/95	0.013	0.000	0.247	1138
5/27/95	0.021	0.001	0.206	1779
5/28/95	0.025	0.000	0.230	2203
5/29/95	0.005	0.001	0.027	459
5/30/95	0.004	0.000	0.023	378
5/31/95	0.004	0.000	0.107	359
Monthly Values				
Mean	0.008	0.000	0.076	729
Min.	0.000	0.000	0.000	0
Max.	0.126	0.005	0.798	10861

Total Discharge: 22589 Cubic Feet

KEY: BD = bad data; *italics* = estimated data from field observations and discharge record at adjacent gages

Bad data can be attributed to equipment failures and winter freezing conditions.

Figure 3-9. GS24 Monthly Discharge

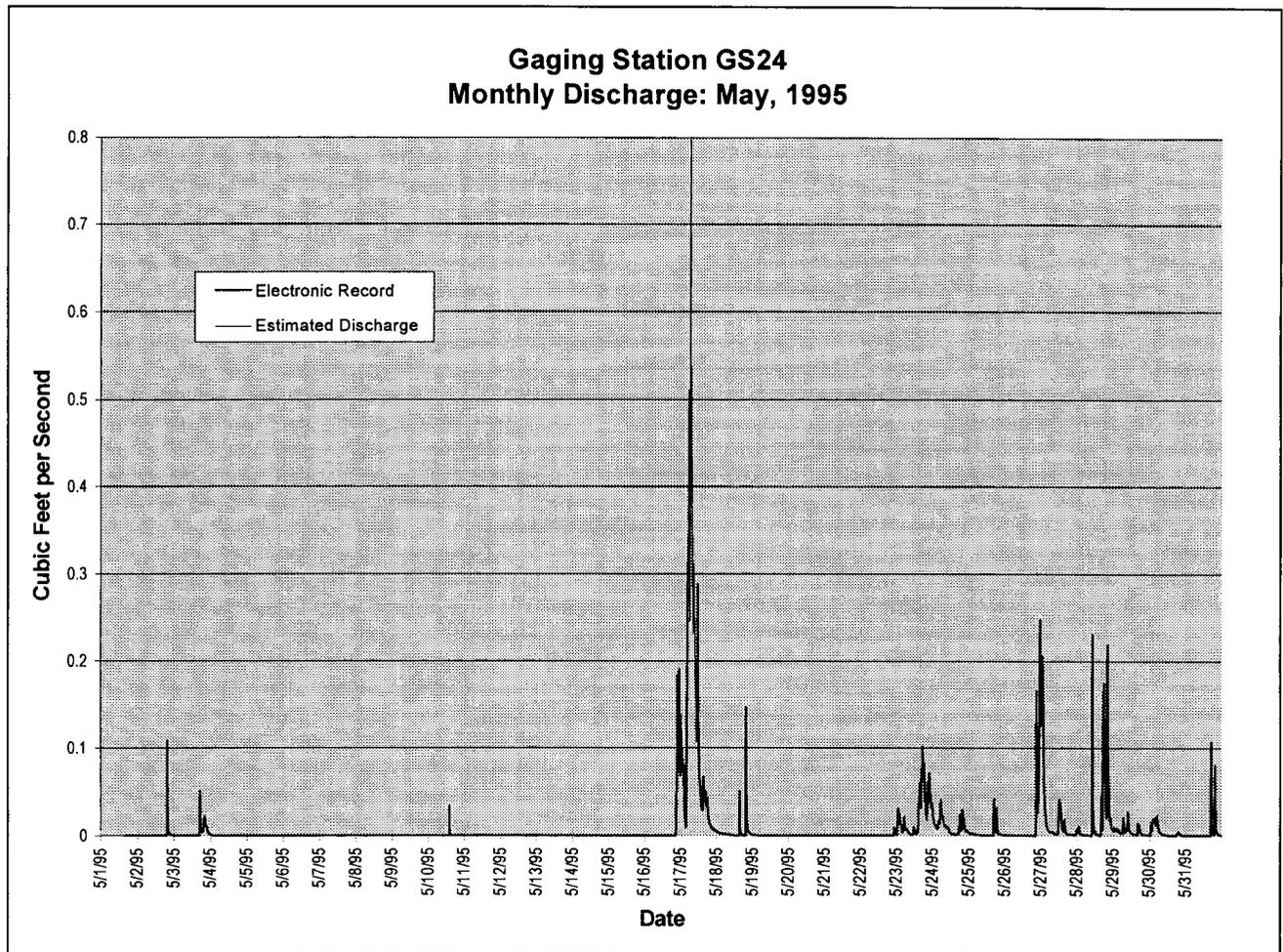
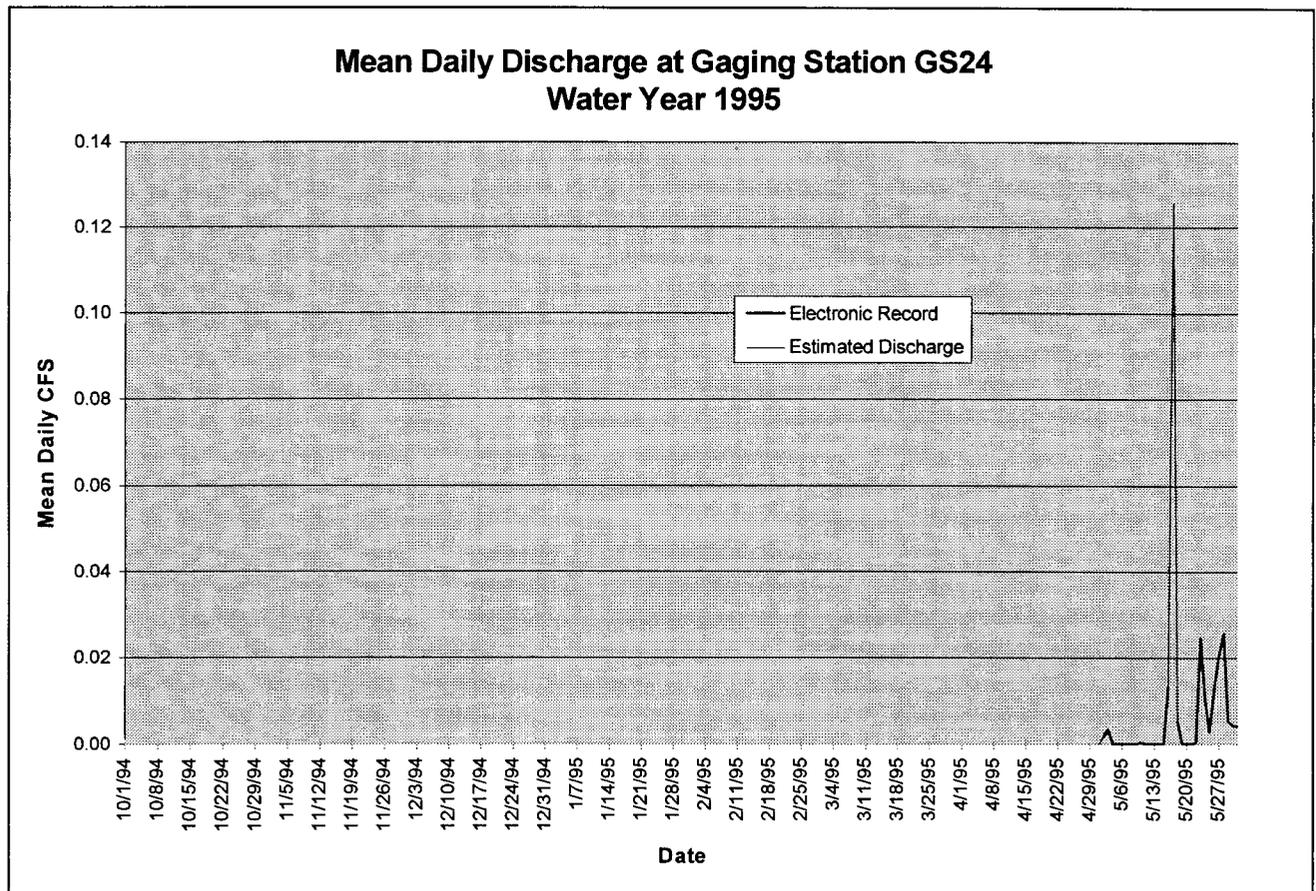


Figure 3-10. GS24 Mean Daily Discharge, Water Year 1995



Analytical Results

No analytical results compiled to date.

3.1.6 Gaging Station GS25

Location:

- State Plane: 2084114; 747891
- 18.5" cmp southeast of 881

Drainage Characteristics:

- Pathway 5
- Buildings: 883, T883, T881A, -B, 890, 881, 881F, 882, 830, T881G, 887, 885
- Sub-basins: DIV3 (Figure 1-2)
- Description: GS25 monitors a 18.5" cmp which outfalls on the hillside southeast of Building 881. Surface water at this site originates as runoff from the areas east, north, and northeast of 881.

Hardware Configuration:

- Primary Device: 1 foot H flume
- Flow Meter: ISCO 4230 bubbler
- Sampler: ISCO 3710 Automatic
ISCO 6000 Automatic VOC
- Radio Telemetry: No
- Power: DC solar power system
- Water Quality Parameters: None

Discharge Data

Table 3-6. GS25 Mean Daily Discharge Data

Date	Mean CFS	Min. CFS	Max. CFS	Discharge
5/1/95	0.009	0.003	0.024	760
5/2/95	0.013	0.003	0.213	1148
5/3/95	0.020	0.003	0.161	1759
5/4/95	0.005	0.003	0.015	461
5/5/95	0.003	0.002	0.003	248
5/6/95	0.002	0.001	0.003	140
5/7/95	0.001	0.001	0.001	81
5/8/95	0.001	0.000	0.002	89
5/9/95	0.000	0.000	0.001	35
5/10/95	0.001	0.000	0.007	56
5/11/95	0.000	0.000	0.001	20
5/12/95	0.000	0.000	0.000	11
5/13/95	0.003	0.000	0.039	249
5/14/95	0.002	0.000	0.020	134
5/15/95	0.000	0.000	0.000	0
5/16/95	0.032	0.000	0.450	2734
5/17/95	0.257	0.025	1.424	22165
5/18/95	0.026	0.011	0.262	2238
5/19/95	0.009	0.005	0.017	737
5/20/95	0.004	0.003	0.005	349
5/21/95	0.002	0.000	0.004	162
5/22/95	0.004	0.001	0.041	380
5/23/95	0.068	0.011	0.247	5918
5/24/95	0.050	0.011	0.148	4331
5/25/95	0.017	0.007	0.067	1457
5/26/95	0.038	0.004	0.483	3243
5/27/95	0.057	0.011	0.363	4883
5/28/95	0.071	0.010	0.433	6091
5/29/95	0.027	0.014	0.078	2322
5/30/95	0.023	0.009	0.072	2029
5/31/95	0.022	0.005	0.321	1925
Monthly Values				
<i>Mean</i>	0.025	0.005	0.158	2134
<i>Min.</i>	0.000	0.000	0.000	0
<i>Max.</i>	0.257	0.025	1.424	22165

Total Discharge: 66154 Cubic Feet

KEY: BD = bad data; *italics* = estimated data from field observations and discharge record at adjacent gages

Bad data can be attributed to equipment failures and winter freezing conditions.

Figure 3-11. GS25 Monthly Discharge

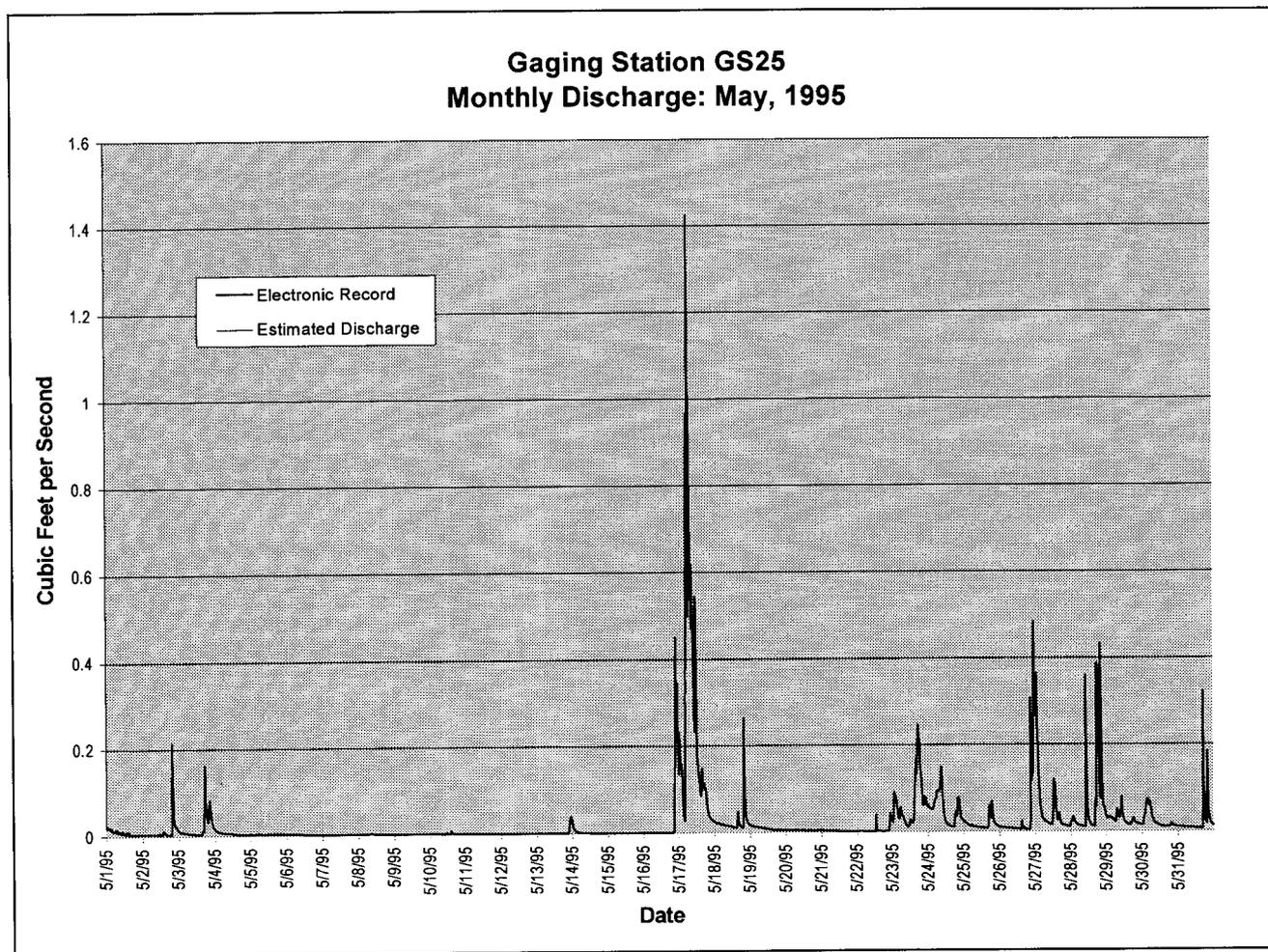
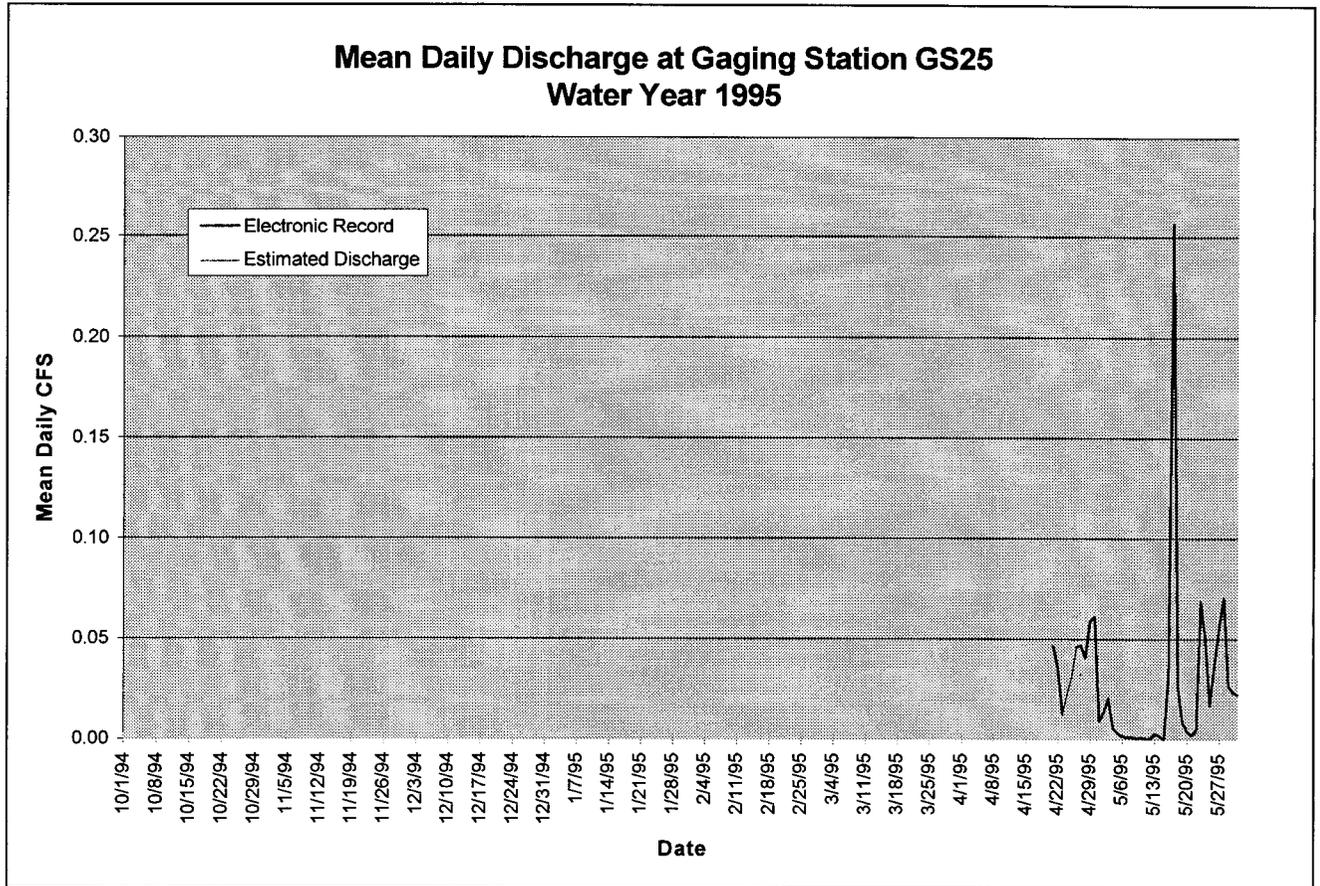


Figure 3-12. GS25 Mean Daily Discharge, Water Year 1995



Analytical Results

No analytical results compiled to date.

3.1.7 Gaging Station SW022

Location:

- State Plane: 2086443.2; 749757.8
- Central Avenue Ditch at the splitter box near T903A, Inner East Gate

Drainage Characteristics:

- Pathway 1
- Total and Effective Area: $0.132 \text{ mi.}^2 = 84.5 \text{ ac}$ (approximately 75% impervious)
- Sub-basins: CSWAA2, CSWAA3, CSWAA4, CSWAA5, CSWAA6 (Figure 1-2)
- Description: SW022 lies on the Central Avenue Ditch at the splitter box near T903A, Inner East Gate. The basin consists of the southern area of the Industrial Area.
- Areas draining to this site: 900, 800, 600, 400, 300, 100

Hardware Configuration:

- Primary Device: 9 1/2" Parshall flume
- Flow Meter: ISCO® Model 4230 (bubbler)
- Sampler: ISCO® Model 3700R Refrigerated
ISCO® Model 6000 Automatic VOC
- Radio Telemetry: No
- Power: DC solar power system
- Water Quality Parameters: None

Discharge Data

Table 3-7. SW022 Mean Daily Discharge Data

Date	Mean CFS	Min. CFS	Max. CFS	Discharge
5/1/95	0.039	0.007	0.224	3349
5/2/95	0.085	0.004	1.559	7338
5/3/95	0.250	0.008	1.521	21582
5/4/95	0.131	0.030	0.317	11312
5/5/95	0.013	0.003	0.045	1084
5/6/95	0.001	0.000	0.003	63
5/7/95	0.000	0.000	0.000	0
5/8/95	0.006	0.000	0.083	544
5/9/95	0.000	0.000	0.000	0
5/10/95	0.000	0.000	0.000	0
5/11/95	0.000	0.000	0.000	0
5/12/95	0.000	0.000	0.000	0
5/13/95	0.000	0.000	0.000	0
5/14/95	0.002	0.000	0.034	203
5/15/95	0.000	0.000	0.000	0
5/16/95	0.297	0.000	4.397	25622
5/17/95	3.128	0.202	11.651	270283
5/18/95	0.213	0.042	2.571	18441
5/19/95	0.031	0.009	0.132	2649
5/20/95	0.009	0.006	0.016	755
5/21/95	0.004	0.000	0.012	352
5/22/95	0.006	0.000	0.117	518
5/23/95	1.061	0.057	4.075	91701
5/24/95	0.630	0.209	2.052	54390
5/25/95	0.243	0.115	0.730	20954
5/26/95	0.372	0.052	3.991	32136
5/27/95	0.928	0.116	4.421	80193
5/28/95	0.976	0.077	4.458	84356
5/29/95	0.302	0.088	0.792	26056
5/30/95	0.222	0.028	0.851	19140
5/31/95	0.223	0.010	2.650	19251
Monthly Values				
<i>Mean</i>	0.296	0.034	1.507	25557
<i>Min.</i>	0.000	0.000	0.000	0
<i>Max.</i>	3.128	0.209	11.651	270283

Total Discharge: 792272 Cubic Feet

KEY: BD = bad data; *italics* = estimated data from field observations and discharge record at adjacent gages

Bad data can be attributed to equipment failures and winter freezing conditions.

Figure 3-13. SW022 Monthly Discharge

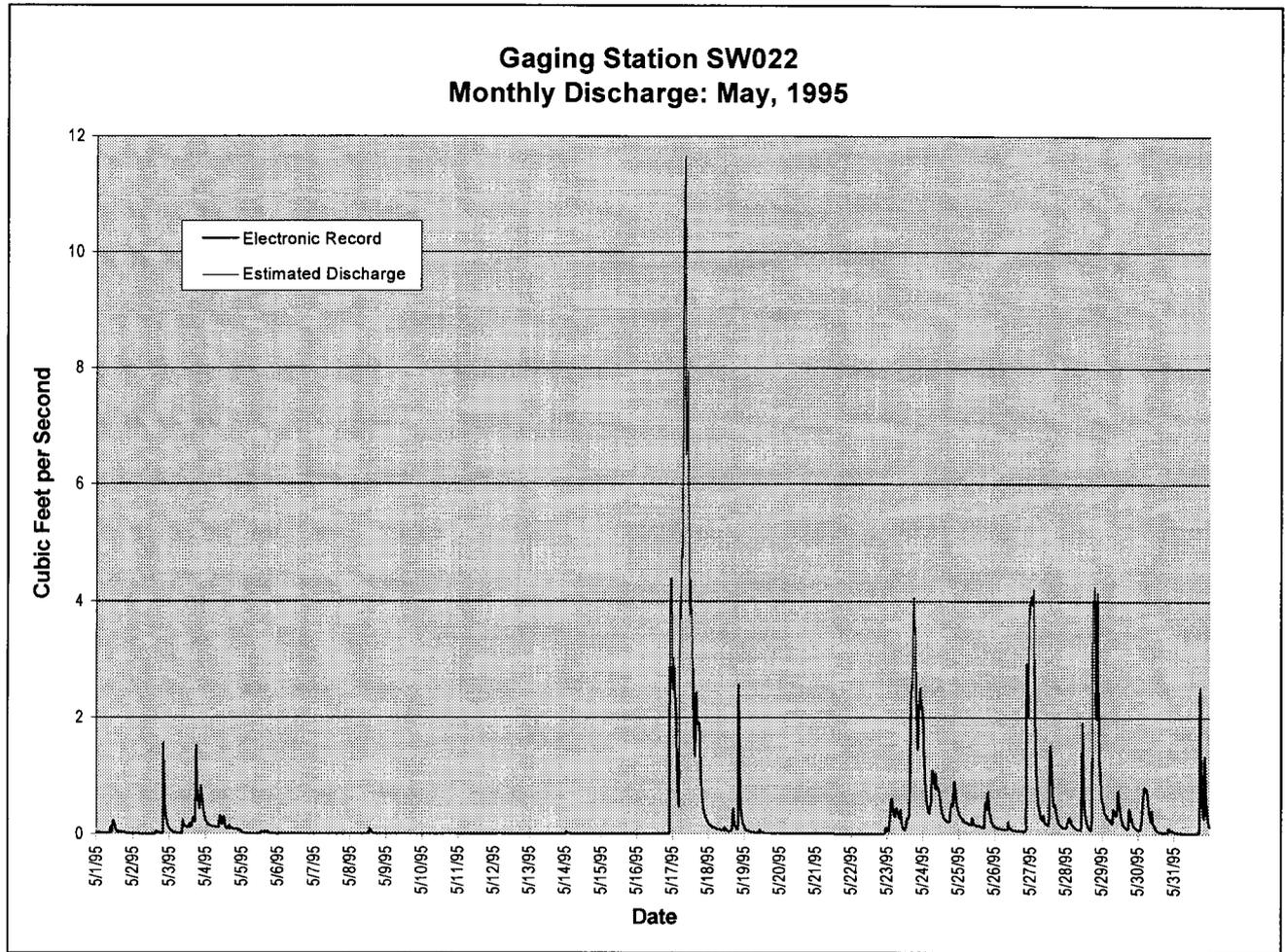
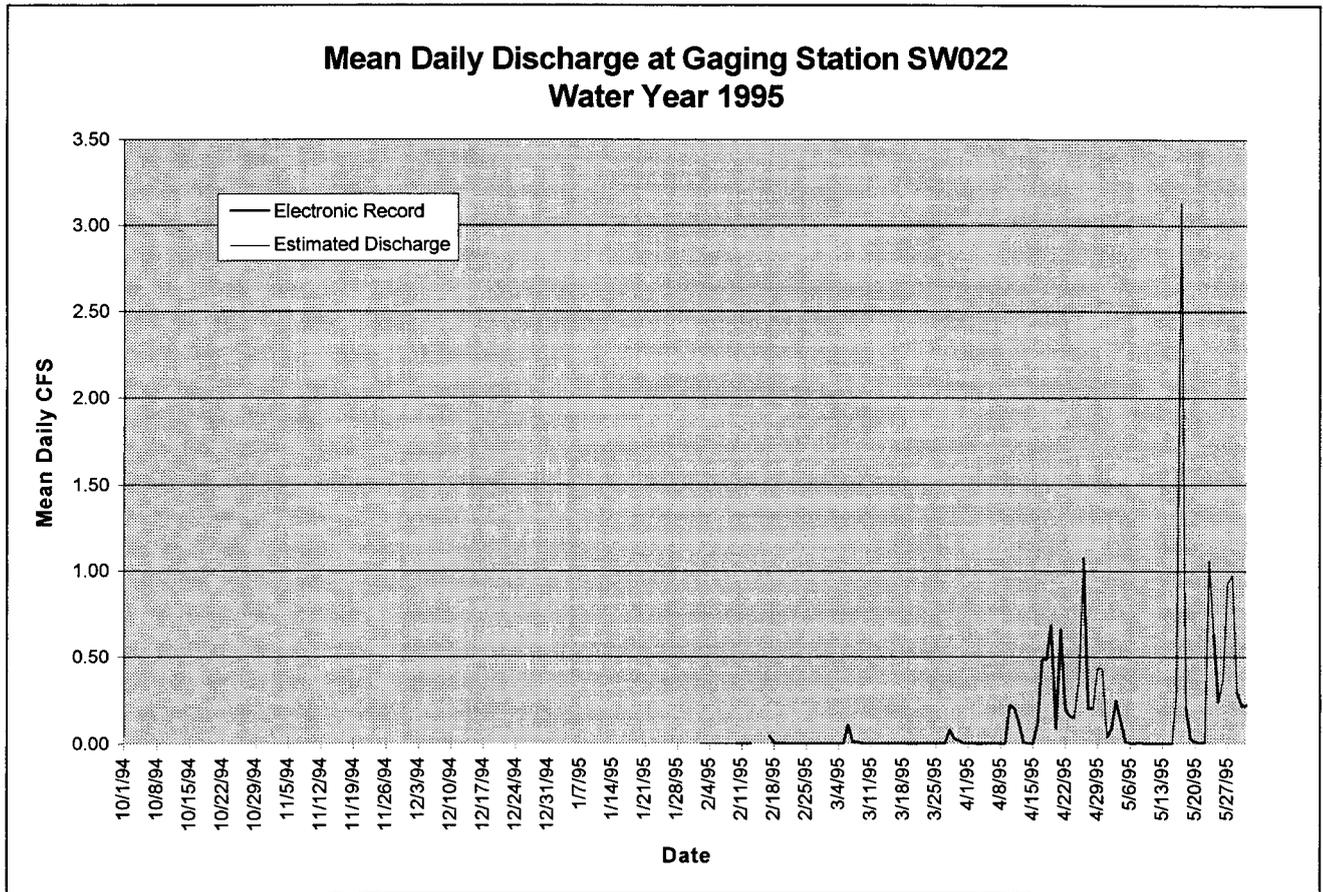


Figure 3-14. SW022 Mean Daily Discharge, Water Year 1995



Analytical Results

No analytical results compiled to date.

3.1.8 Gaging Station SW027

Location:

- 39° 53' 11.5"N 105° 11' 4.3"W
- SID Culvert Number 4; outlet of SID to Pond C-2 prior to crossing under Woman Creek

Drainage Characteristics:

- Pathway 5
- Area: 0.29 mi.² = 185.6 ac (approximately 15% impervious)
- Sub-basins: DIV2, DIV3, CDIV1 (Figure 1-2)
- Description: SW027 lies on the South Interceptor Ditch at the upstream end of dual 66" cmps which convey SID water under Woman Creek and into Pond C-2. The basin consists of the sloping, vegetated area immediately south of the Industrial Area. This basin receives Industrial Area runoff primarily from the 800 and 400 Areas.

Hardware Configuration:

- Primary Device: Dual 120° V-notch weirs
- Flow Meter: ISCO® Model 3230 (bubbler)
- Sampler: ISCO® Model 3700R Refrigerated
- Radio Telemetry: No
- Power: DC solar power system
- Water Quality Parameters: None

Discharge Data

Dual 120° V-notch weirs were installed on April 7, 1995.

Table 3-8. SW027 Mean Daily Discharge Data

Date	Mean CFS	Min. CFS	Max. CFS	Discharge
5/1/95	0.084	0.027	0.266	7254
5/2/95	0.018	0.014	0.026	1534
5/3/95	0.107	0.020	0.542	9259
5/4/95	0.190	0.030	0.568	16386
5/5/95	0.013	0.005	0.029	1128
5/6/95	0.003	0.002	0.005	272
5/7/95	0.002	0.002	0.003	197
5/8/95	0.003	0.002	0.006	231
5/9/95	0.002	0.001	0.002	159
5/10/95	0.002	0.002	0.002	147
5/11/95	0.002	0.001	0.002	136
5/12/95	0.000	0.000	0.001	37
5/13/95	0.000	0.000	0.000	0
5/14/95	0.000	0.000	0.000	0
5/15/95	0.000	0.000	0.000	0
5/16/95	0.000	0.000	0.009	19
5/17/95	6.373	0.017	16.400	550632
5/18/95	0.692	0.289	2.113	59755
5/19/95	0.343	0.090	1.270	29668
5/20/95	0.066	0.042	0.089	5709
5/21/95	0.036	0.021	0.051	3151
5/22/95	0.013	0.006	0.021	1126
5/23/95	0.786	0.006	3.385	67892
5/24/95	1.197	0.403	2.328	103419
5/25/95	0.401	0.192	0.845	34611
5/26/95	0.237	0.103	0.669	20467
5/27/95	2.218	0.444	8.248	191649
5/28/95	1.451	0.362	6.231	125364
5/29/95	1.152	0.593	4.321	99519
5/30/95	0.631	0.313	1.220	54521
5/31/95	0.352	0.197	1.145	30423
Monthly Values				
<i>Mean</i>	0.528	0.103	1.606	45634
<i>Min.</i>	0.000	0.000	0.000	0
<i>Max.</i>	6.373	0.593	16.400	550632

Total Discharge: 1414667 Cubic Feet

KEY: BD = bad data; *italics* = estimated data from field observations and discharge record at adjacent gages

Bad data can be attributed to equipment failures and winter freezing conditions.

Figure 3-15. SW027 Monthly Discharge

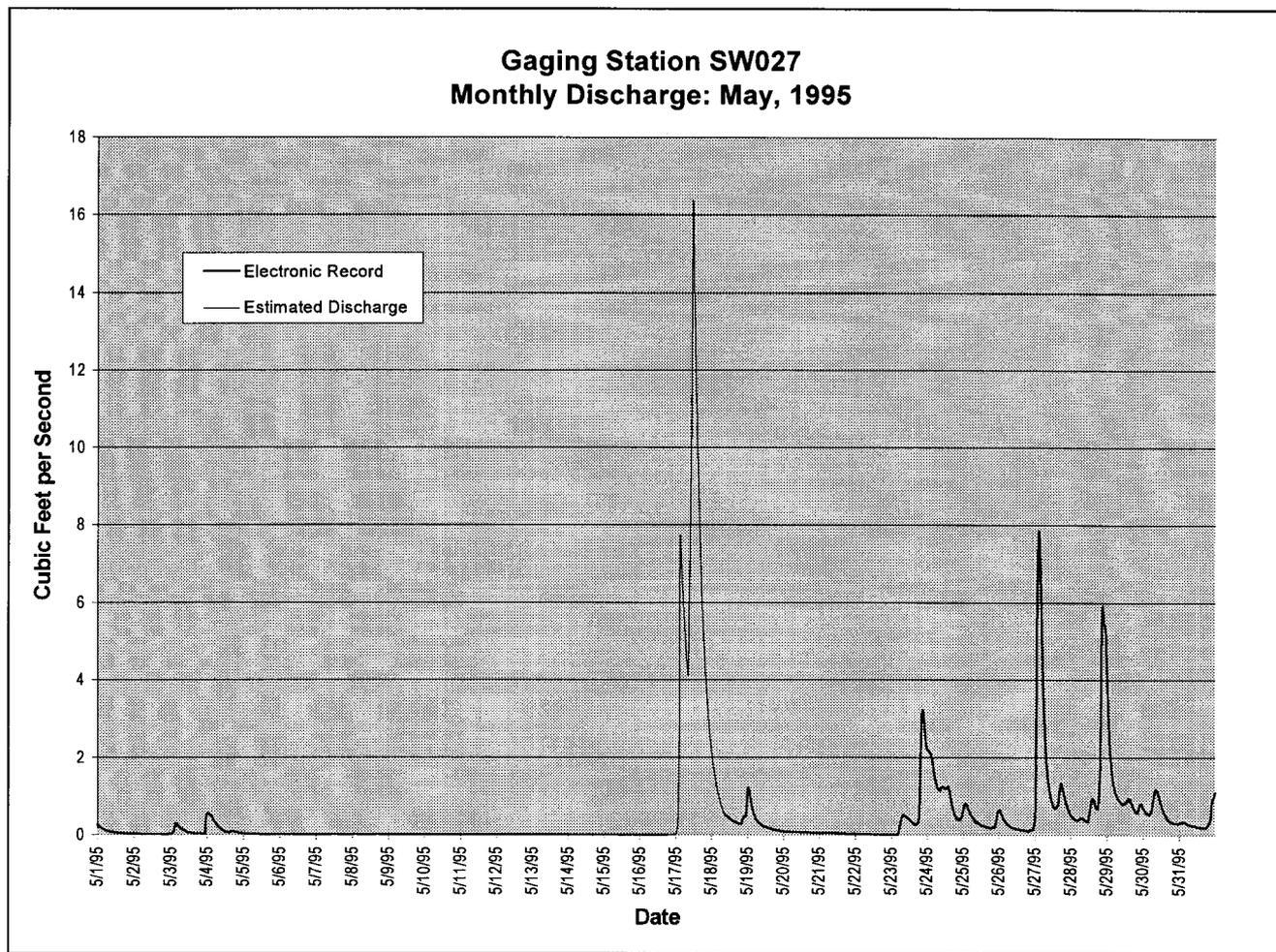
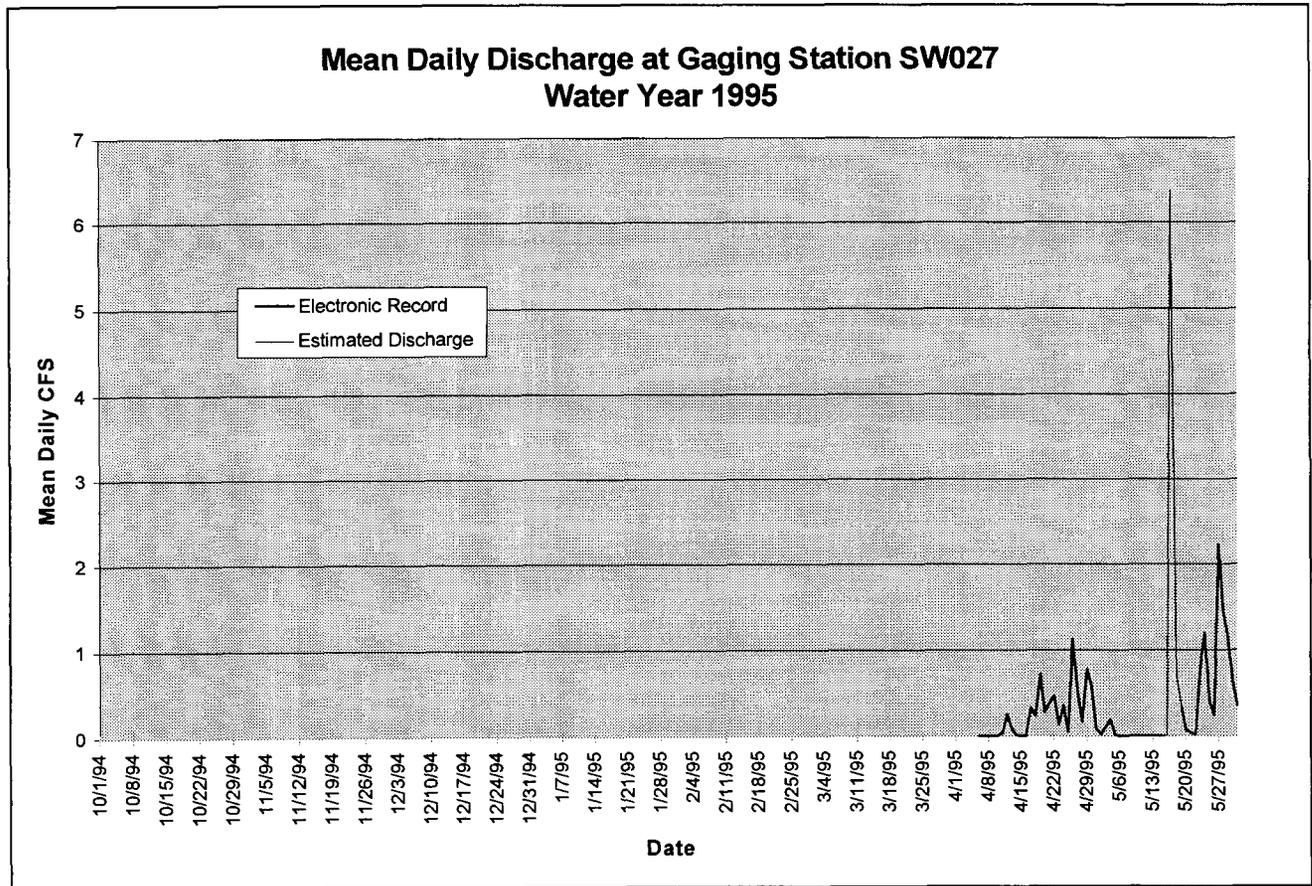


Figure 3-16. SW027 Mean Daily Discharge, Water Year 1995



Analytical Results

No analytical results compiled to date.

3.1.9 Gaging Station SW091

Location:

- State Plane: 2086064; 751322
- small tributary of North Walnut Creek, which drains the northeast corner of Industrial Area near the Solar Ponds

Drainage Characteristics:

- Pathway 6
- Area: $0.019 \text{ mi.}^2 = 12.2 \text{ ac}$ (approximately 45% impervious)
- Sub-basins: CWAB1, CWAB2, portion of WA11 (Figure 1-2)
- Description: SW091 lies on a small tributary of North Walnut Creek, which drains the northeast corner of Industrial Area near the Solar Ponds. The basin consists of 10.9 acres of the Industrial Area. This basin receives Industrial Area runoff primarily from the open area immediately east of the Solar Ponds.

Hardware Configuration:

- Primary Device: 1' H Flume
- Flow Meter: ISCO® Model 4230 (bubbler)
- Sampler: ISCO® Model 3710 Automatic
ISCO 6000 Automatic VOC
- Radio Telemetry: No
- Power: DC solar power system
- Water Quality Parameters: None

Discharge Data

Table 3-9. SW091 Mean Daily Discharge Data

Date	Mean CFS	Min. CFS	Max. CFS	Discharge
5/1/95	0.002	0.001	0.003	172
5/2/95	0.001	0.001	0.002	94
5/3/95	0.002	0.000	0.041	191
5/4/95	0.001	0.000	0.002	82
5/5/95	0.000	0.000	0.001	41
5/6/95	0.000	0.000	0.000	10
5/7/95	0.000	0.000	0.000	0
5/8/95	0.000	0.000	0.000	0
5/9/95	0.000	0.000	0.000	0
5/10/95	0.000	0.000	0.000	0
5/11/95	0.000	0.000	0.000	0
5/12/95	0.000	0.000	0.000	0
5/13/95	0.000	0.000	0.000	1
5/14/95	0.000	0.000	0.010	18
5/15/95	0.000	0.000	0.000	0
5/16/95	0.000	0.000	0.004	7
5/17/95	0.312	0.001	2.268	26954
5/18/95	0.018	0.009	0.047	1519
5/19/95	0.008	0.006	0.011	654
5/20/95	0.005	0.004	0.006	406
5/21/95	0.003	0.002	0.004	270
5/22/95	0.002	0.002	0.003	208
5/23/95	0.031	0.002	0.121	2707
5/24/95	0.028	0.013	0.109	2441
5/25/95	0.011	0.009	0.017	950
5/26/95	0.021	0.005	0.436	1830
5/27/95	0.066	0.016	0.443	5680
5/28/95	0.063	0.011	0.579	5412
5/29/95	0.023	0.013	0.057	1962
5/30/95	0.017	0.011	0.056	1499
5/31/95	0.012	0.007	0.029	1078
Monthly Values				
Mean	0.020	0.004	0.137	1748
Min.	0.000	0.000	0.000	0
Max.	0.312	0.016	2.268	26954

Total Discharge: 54180 Cubic Feet

KEY: BD = bad data; *italics* = estimated data from field observations and discharge record at adjacent gages

Bad data can be attributed to equipment failures and winter freezing conditions.

Figure 3-17. SW091 Monthly Discharge

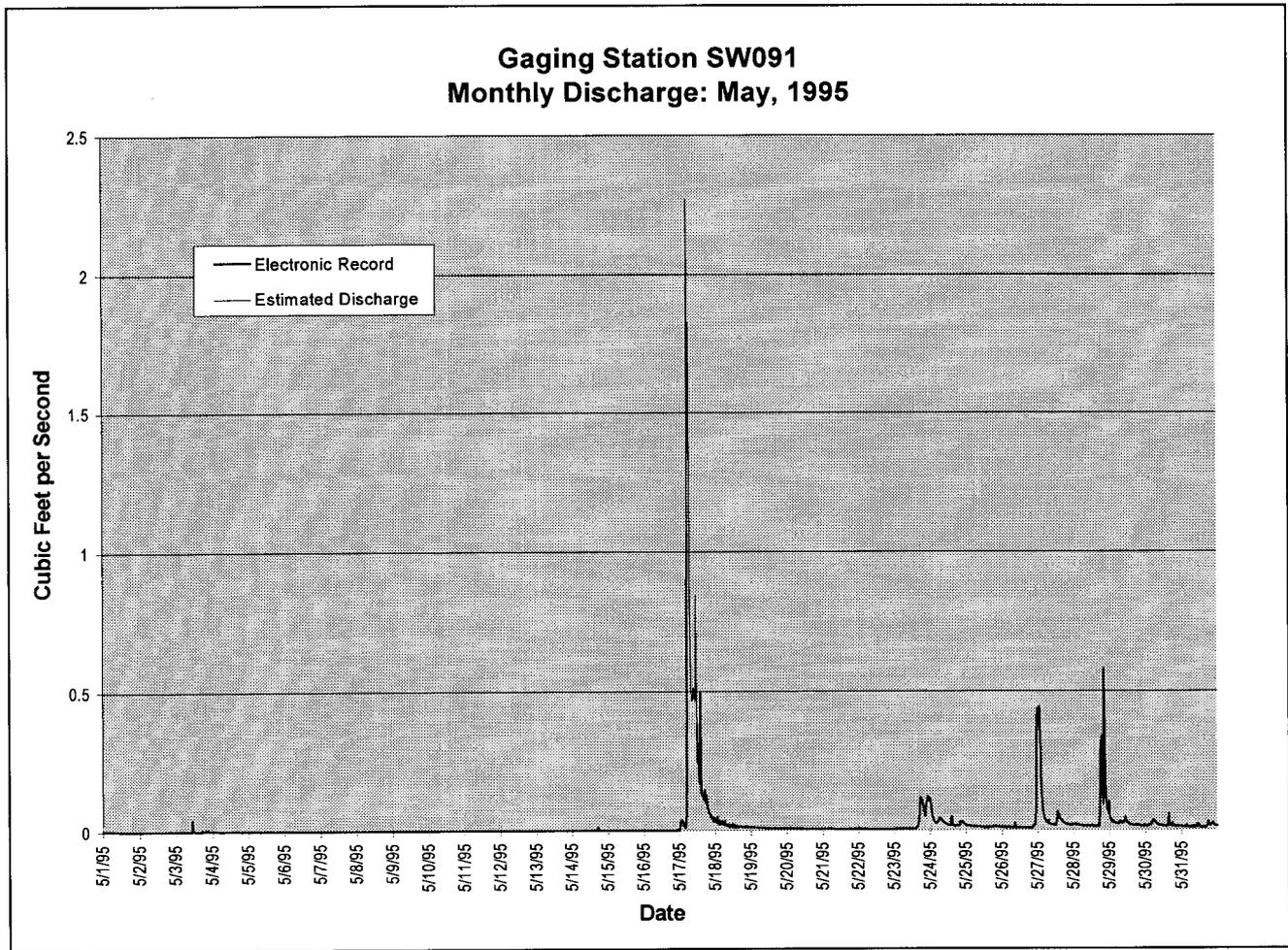
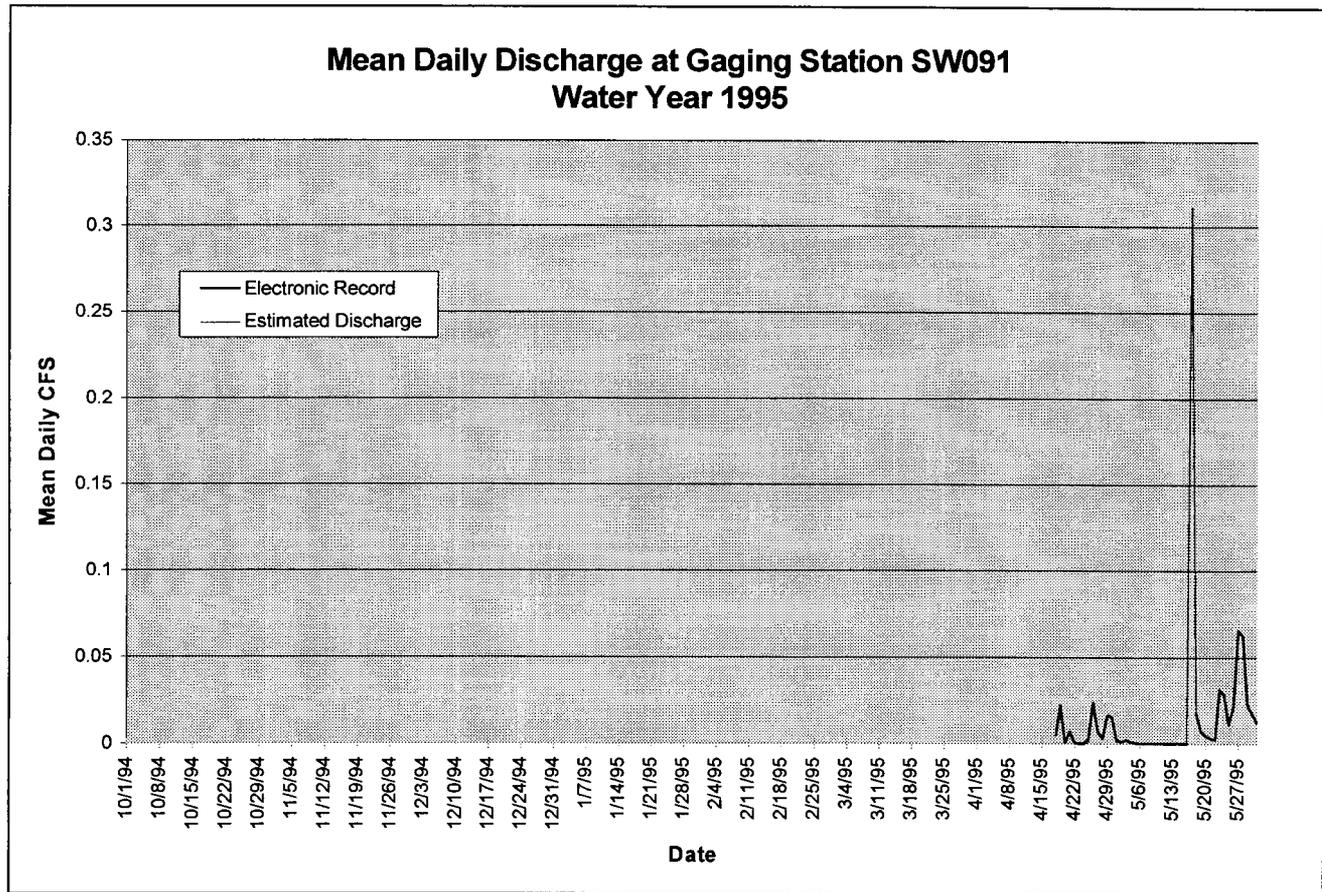


Figure 3-18. SW091 Mean Daily Discharge, Water Year 1995



Analytical Results

No analytical results compiled to date.

3.1.10 Gaging Station SW093

Location:

- State Plane: 2085008.5; 751710.2
- North Walnut Creek below 6' cmp draining Industrial Area; directly north of Solar Pond C

Drainage Characteristics:

- Pathway 3
- Area: $0.362 \text{ mi.}^2 = 231.7 \text{ ac}$ (approximately 46% impervious)
- Sub-basins: WA12a, WA13, WA14, CWAA1, CWAC6, CWAC5, CWAC2, CWAC4, CWAC3, CWAC10, CWAC13, CWAC11, CWAC1, CWAC12, CWADIV2b (Figure 1-2)
- Description: SW093 lies on North Walnut Creek, which drains the north and northwest areas of Industrial Area. The basin consists of 150.4 acres of the Industrial Area. This basin receives Industrial Area runoff from the 700, 500, 300, and 100 Areas.

Hardware Configuration:

- Primary Device: 36" Parshall Flume w/ a 36" Rectangular Weir
- Flow Meter: ISCO® Model 3230 (bubbler)
- Sampler: ISCO® Model 3700R Refrigerated
ISCO® Model 6000 VOC
- Radio Telemetry: Yes
- Power: DC solar power system
- Water Quality Parameters: None

Discharge Data

Table 3-10. SW093 Mean Daily Discharge Data

Date	Mean CFS	Min. CFS	Max. CFS	Discharge
5/1/95	0.641	0.475	0.840	55419
5/2/95	0.661	0.463	2.264	57077
5/3/95	0.934	0.533	2.440	80668
5/4/95	0.634	0.486	0.912	54768
5/5/95	0.470	0.368	0.548	40576
5/6/95	0.389	0.326	0.457	33647
5/7/95	0.361	0.326	0.430	31229
5/8/95	0.342	0.297	0.389	29566
5/9/95	0.325	0.296	0.363	28111
5/10/95	0.320	0.280	0.362	27627
5/11/95	0.314	0.272	0.372	27130
5/12/95	0.293	0.228	0.380	25346
5/13/95	0.276	0.163	0.690	23862
5/14/95	0.258	0.176	0.497	22264
5/15/95	0.215	0.157	0.291	18540
5/16/95	0.893	0.171	8.675	77128
5/17/95	8.960	1.730	54.838	774129
5/18/95	1.289	0.744	4.438	111368
5/19/95	0.562	0.398	0.911	48522
5/20/95	0.400	0.353	0.458	34551
5/21/95	0.309	0.248	0.378	26659
5/22/95	0.298	0.245	0.680	25760
5/23/95	2.584	0.526	8.097	223249
5/24/95	2.283	0.911	5.553	197235
5/25/95	0.947	0.559	2.652	81811
5/26/95	1.521	0.402	16.438	131394
5/27/95	3.280	0.880	16.478	283376
5/28/95	3.376	0.711	15.740	291645
5/29/95	1.578	0.916	2.635	136302
5/30/95	1.190	0.687	2.682	102808
5/31/95	1.031	0.488	4.819	89085
Monthly Values				
Mean	1.191	0.478	5.055	102931
Min.	0.215	0.157	0.291	18540
Max.	8.960	1.730	54.838	774129

Total Discharge: 3190854 Cubic Feet

KEY: BD = bad data; *italics* = estimated data from field observations and discharge record at adjacent gages

Bad data can be attributed to equipment failures and winter freezing conditions.

Figure 3-19. SW093 Monthly Discharge

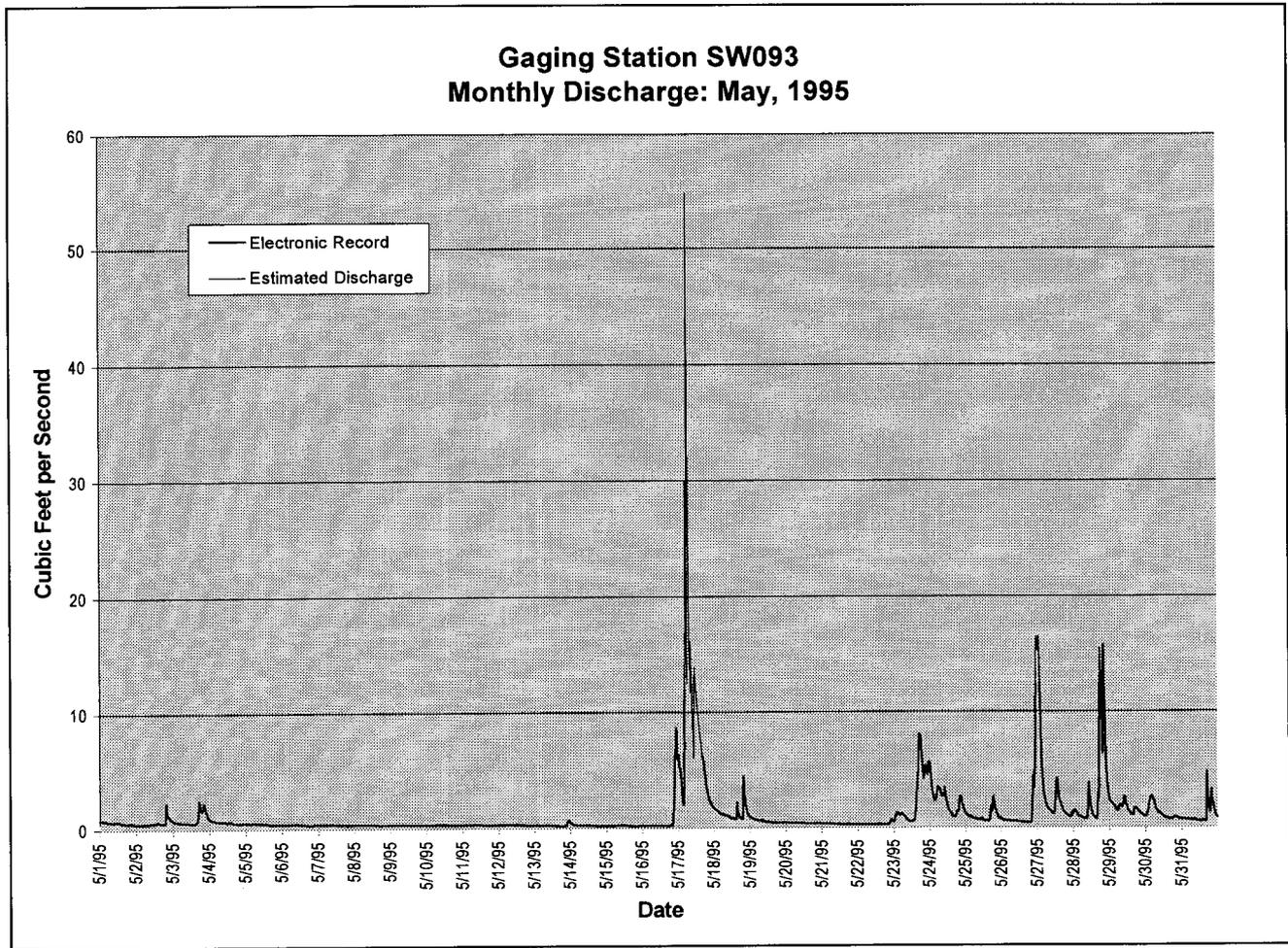
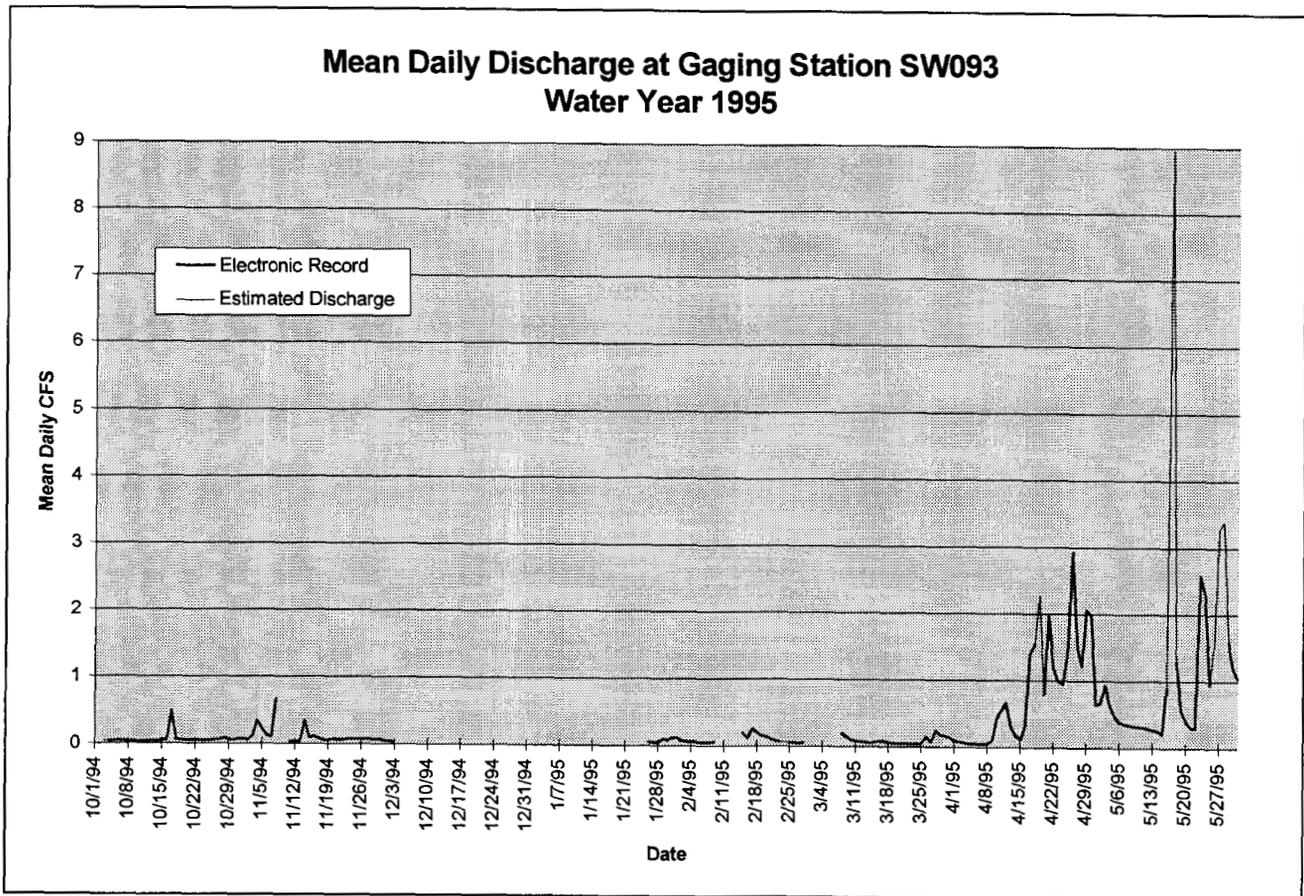


Figure 3-20. SW093 Mean Daily Discharge, Water Year 1995



Analytical Results

No analytical results compiled to date.

3.1.11 Gaging Station SW998

Location:

- State Plane: 2080607.8; 749862.5
- West Diversion Ditch north of 130 buildings

Drainage Characteristics:

- Pathway 4
- Area: $0.069 \text{ mi.}^2 = 44.2 \text{ ac}$ (approximately 90% impervious)
- Sub-basins: CWADIV1, CWADIV2a, WADIV2b (Figure 1-2)
- Description: SW998 lies on the West Diversion Ditch north of the 130 area. This basin receives Industrial Area runoff from the 130 areas only.

Hardware Configuration:

- Primary Device: 9.5" Parshall Flume
- Flow Meter: ISCO® Model 3230 (bubbler)
- Sampler: ISCO® Model 3700 Portable
ISCO® Model 6000 VOC
- Radio Telemetry: No
- Power: AC line power
- Water Quality Parameters: None

Discharge Data

Table 3-11. SW998 Mean Daily Discharge Data

Date	Mean CFS	Min. CFS	Max. CFS	Discharge
5/1/95	0.188	0.103	0.330	16274
5/2/95	0.169	0.076	1.652	14582
5/3/95	0.590	0.144	1.864	50934
5/4/95	0.414	0.110	1.129	35758
5/5/95	0.185	0.079	0.761	15991
5/6/95	0.656	0.430	0.866	56673
5/7/95	0.229	0.076	0.472	19774
5/8/95	BD	BD	BD	BD
5/9/95	BD	BD	BD	BD
5/10/95	BD	BD	BD	BD
5/11/95	BD	BD	BD	BD
5/12/95	BD	BD	BD	BD
5/13/95	0.054	0.001	0.456	4643
5/14/95	0.023	0.004	0.192	1998
5/15/95	0.006	0.001	0.010	482
5/16/95	0.390	0.002	4.062	33713
5/17/95	5.540	0.335	15.381	478614
5/18/95	0.670	0.268	3.407	57902
5/19/95	0.305	0.142	0.639	26317
5/20/95	0.081	0.058	0.142	6977
5/21/95	0.043	0.028	0.059	3752
5/22/95	0.047	0.006	0.392	4042
5/23/95	BD	BD	BD	BD
5/24/95	BD	BD	BD	BD
5/25/95	0.658	0.264	2.006	56841
5/26/95	0.684	0.110	6.045	59140
5/27/95	1.608	0.566	5.017	138918
5/28/95	1.554	0.298	6.999	134249
5/29/95	1.080	0.539	2.842	93274
5/30/95	0.647	0.253	1.431	55929
5/31/95	0.309	0.106	2.393	26740
Monthly Values				
<i>Mean</i>	0.672	0.167	2.439	58063
<i>Min.</i>	0.006	0.001	0.010	482
<i>Max.</i>	5.540	0.566	15.381	478614

Total Discharge: 1393518 Cubic Feet
 Partial Month

Backwater: 5/8-5/12; 5/23-5/24

KEY: BD = bad data; *italics* = estimated data from field observations and discharge record at adjacent gages

Bad data can be attributed to equipment failures and winter freezing conditions.

Figure 3-21. SW998 Monthly Discharge

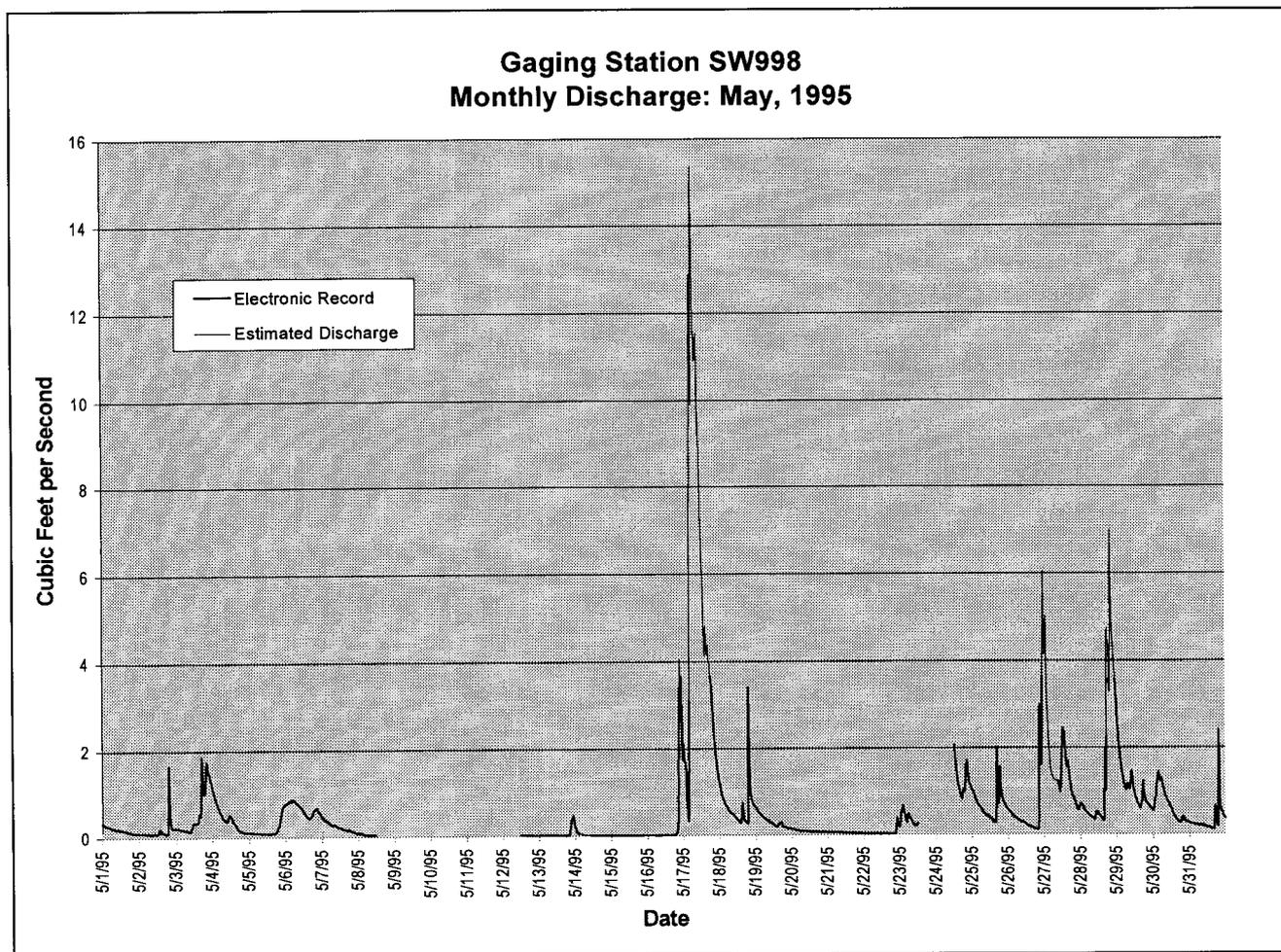
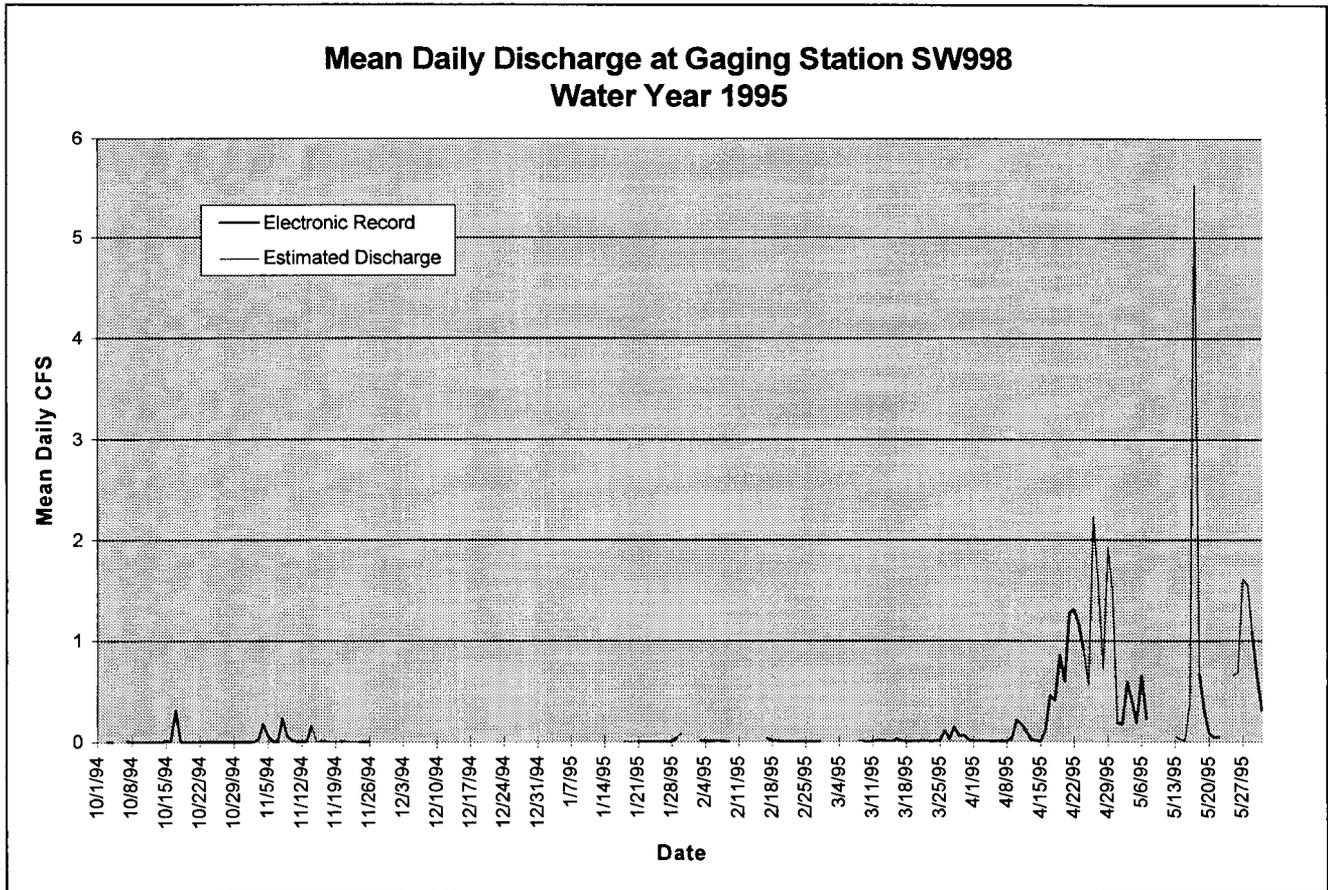


Figure 3-22. SW998 Mean Daily Discharge, Water Year 1995



Analytical Results

No analytical results compiled to date.

3.2 Tier II: D&D Subbasin Outfalls

The objective of the Tier II Industrial Area gaging stations is to monitor surface water at the outlet of the subbasins where D&D activities are located. This tier provides a more detailed monitoring approach to identify potential releases and to evaluate the effectiveness of the engineering controls being employed at the specific D&D location.

3.2.1 Gaging Station GS27

Location:

- State Plane: 2083680; 749282
- small drainage ditch NW of Building 884 (see Figure 1-3)

Drainage Characteristics:

- Pathway 1
- Buildings: 889, T889A, 884
- Sub-basins: CSWAA5 (Figure 1-2)
- Description: GS27 monitors a small ditch which outfalls to the Central Avenue Ditch northwest of Building 884. Surface water at this site originates as runoff from the areas north and west of 889 and surrounding 884.

Hardware Configuration:

- Primary Device: 2" cutthroat flume
- Flow Meter: ISCO® Model 4230 (bubbler)
- Sampler: ISCO® Model 3710 Portable
ISCO® Model 6000 VOC
- Radio Telemetry: Yes
- Power: DC solar power system
- Water Quality Parameters: Hydrolab Recorder Multiprobe: pH, temperature, conductivity

Discharge Data

Table 3-12. GS27 Mean Daily Discharge Data

Date	Mean CFS	Min. CFS	Max. CFS	Discharge
5/1/95	0.000	0.000	0.000	0
5/2/95	<i>0.000</i>	<i>0.000</i>	<i>0.037</i>	39
5/3/95	0.001	0.000	0.019	96
5/4/95	0.000	0.000	0.000	0
5/5/95	0.000	0.000	0.000	0
5/6/95	0.000	0.000	0.000	0
5/7/95	0.000	0.000	0.000	0
5/8/95	0.000	0.000	0.000	0
5/9/95	0.000	0.000	0.000	0
5/10/95	0.000	0.000	0.000	0
5/11/95	0.000	0.000	0.000	0
5/12/95	0.000	0.000	0.000	0
5/13/95	0.000	0.000	0.000	0
5/14/95	0.000	0.000	0.000	0
5/15/95	0.000	0.000	0.000	0
5/16/95	<i>0.003</i>	<i>0.000</i>	<i>0.046</i>	237
5/17/95	<i>0.060</i>	<i>0.000</i>	<i>0.371</i>	5167
5/18/95	<i>0.001</i>	<i>0.000</i>	<i>0.048</i>	72
5/19/95	0.000	0.000	0.000	0
5/20/95	0.000	0.000	0.000	0
5/21/95	0.000	0.000	0.000	0
5/22/95	0.000	0.000	0.000	0
5/23/95	0.009	0.000	0.038	735
5/24/95	0.003	0.000	0.014	249
5/25/95	0.000	0.000	0.013	40
5/26/95	0.005	0.000	0.083	398
5/27/95	0.005	0.000	0.055	395
5/28/95	0.006	0.000	0.071	508
5/29/95	0.000	0.000	0.007	24
5/30/95	0.000	0.000	0.004	39
5/31/95	0.001	0.000	0.029	69
Monthly Values				
Mean	0.003	0.000	0.027	260
Min.	0.000	0.000	0.000	0
Max.	0.060	0.000	0.371	5167

Total Discharge: 8067 Cubic Feet

KEY: BD = bad data; *italics* = estimated data from field observations and discharge record at adjacent gages

Bad data can be attributed to equipment failures and winter freezing conditions.

Figure 3-23. GS27 Monthly Discharge

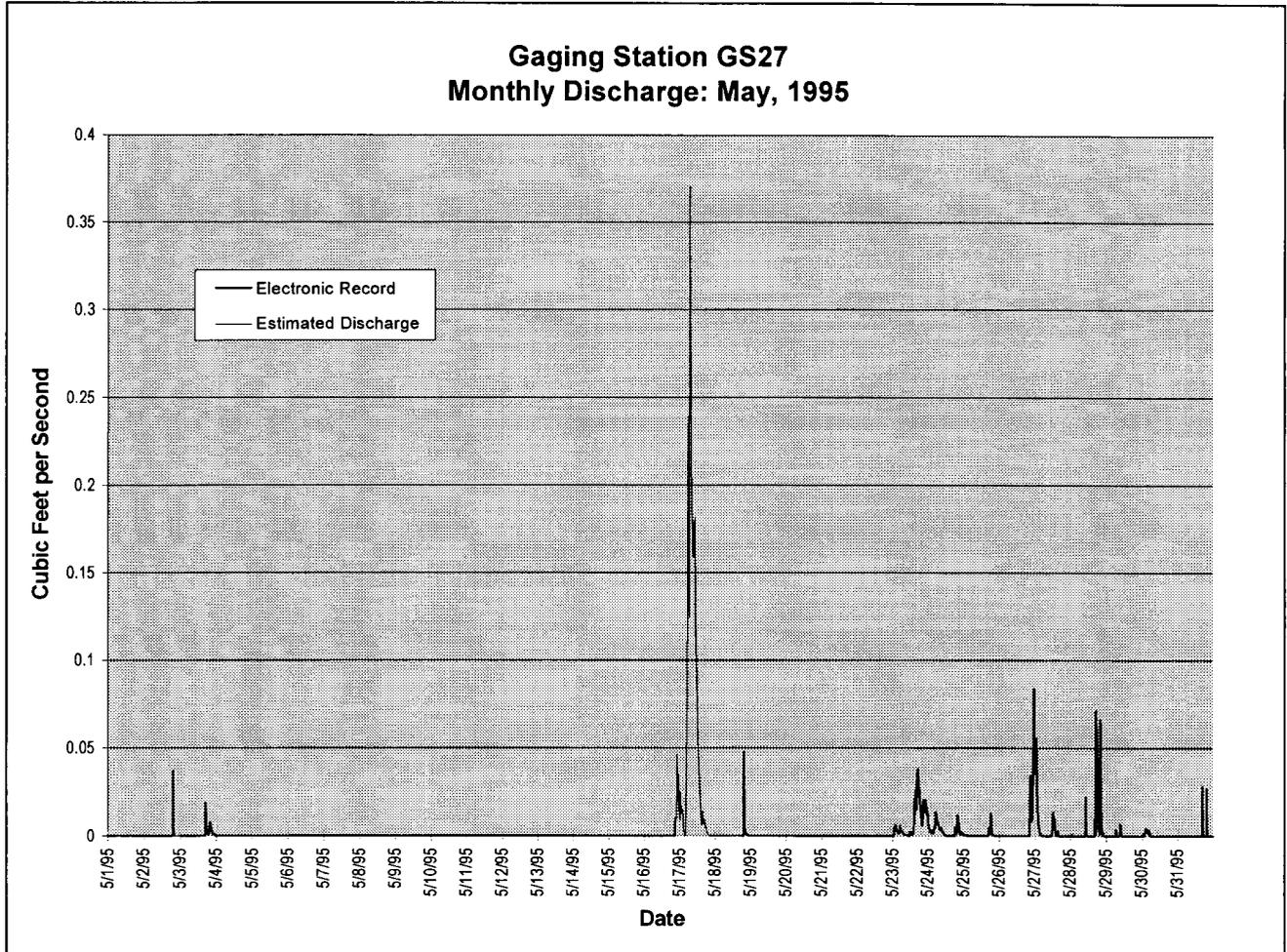
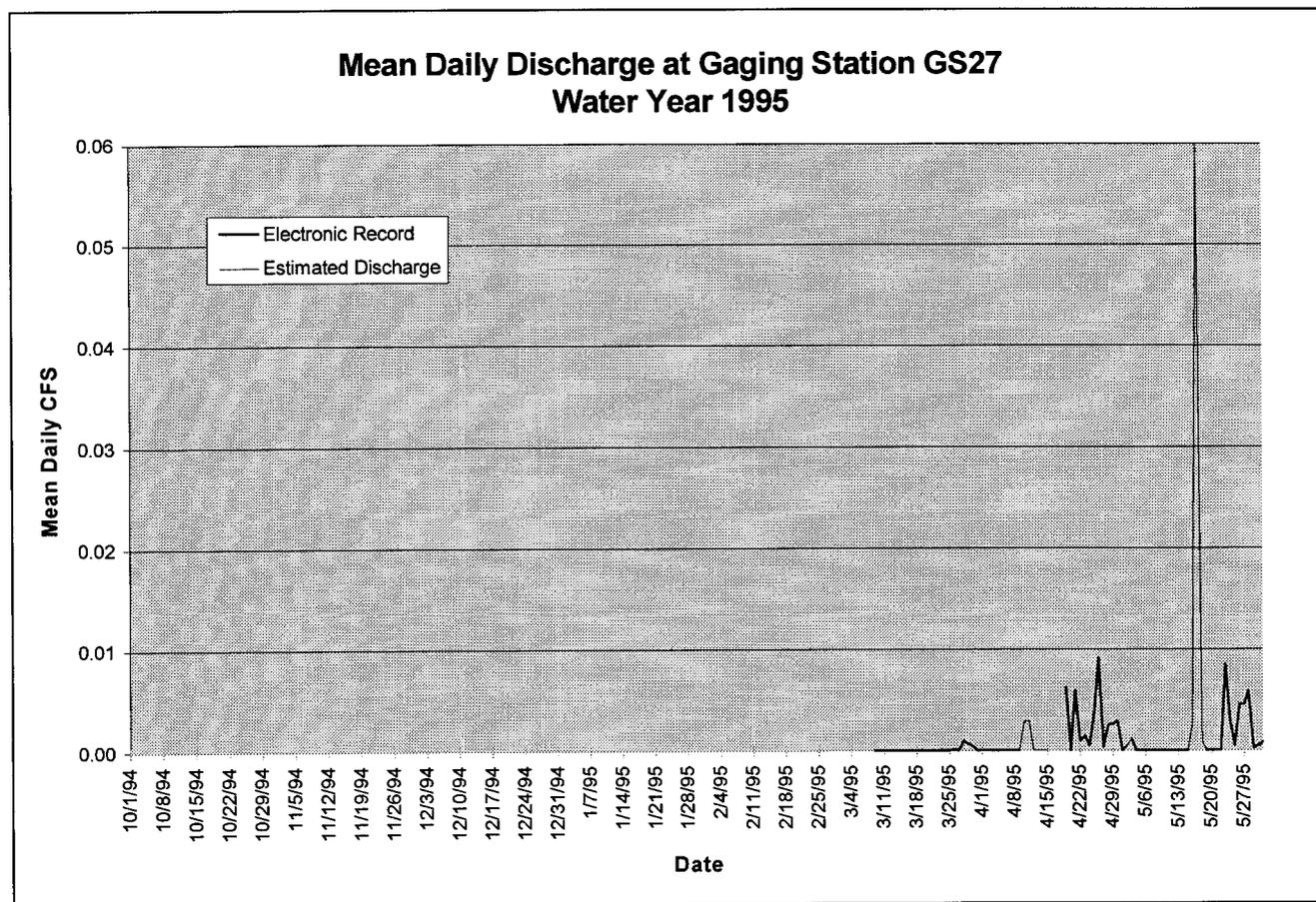


Figure 3-24. GS27 Mean Daily Discharge, Water Year 1995



Analytical Results

No analytical results compiled to date.

3.2.2 Gaging Station GS28

Location:

- State Plane: 2084010; 749282
- concrete drainage channel northwest of Building 865 (see Figure 1-3)

Drainage Characteristics:

- Pathway 1
- Buildings: 889, T889A, 879, 883, 866, 827, 867, 865
- Sub-basins: CSWAA5 (Figure 1-2)
- Description: GS28 monitors a concrete drainage channel which outfalls to the Central Avenue Ditch northeast of Building 889. Surface water at this site originates as runoff from the northern portion of the 800 Area.

Hardware Configuration:

- Primary Device: 4" cutthroat flume
- Flow Meter: ISCO® Model 4230 (bubbler)
- Sampler: ISCO® Model 3710 Portable
ISCO® Model 6000 VOC
- Radio Telemetry: Yes
- Power: DC solar power system
- Water Quality Parameters: Hydrolab Recorder Multiprobe: pH, temperature, conductivity

Discharge Data

Table 3-13. GS28 Mean Daily Discharge Data

Date	Mean CFS	Min. CFS	Max. CFS	Discharge
5/1/95	0.000	0.000	0.000	0
5/2/95	0.000	0.000	0.000	0
5/3/95	0.000	0.000	0.000	0
5/4/95	0.000	0.000	0.000	0
5/5/95	0.000	0.000	0.000	0
5/6/95	0.000	0.000	0.000	0
5/7/95	0.000	0.000	0.000	0
5/8/95	0.000	0.000	0.000	0
5/9/95	0.000	0.000	0.000	0
5/10/95	0.000	0.000	0.000	0
5/11/95	0.000	0.000	0.000	0
5/12/95	0.000	0.000	0.000	0
5/13/95	0.000	0.000	0.000	0
5/14/95	0.000	0.000	0.000	0
5/15/95	0.000	0.000	0.000	0
5/16/95	0.006	0.000	0.196	544
5/17/95	<i>0.262</i>	<i>0.000</i>	<i>1.470</i>	22642
5/18/95	0.000	0.000	0.000	0
5/19/95	0.000	0.000	0.000	0
5/20/95	0.000	0.000	0.000	0
5/21/95	0.000	0.000	0.000	0
5/22/95	0.000	0.000	0.000	0
5/23/95	0.030	0.000	0.191	2599
5/24/95	0.021	0.000	0.094	1845
5/25/95	0.000	0.000	0.005	7
5/26/95	0.014	0.000	0.450	1192
5/27/95	0.042	0.000	0.370	3590
5/28/95	0.042	0.000	0.361	3662
5/29/95	0.003	0.000	0.020	274
5/30/95	0.002	0.000	0.018	144
5/31/95	0.000	0.000	0.004	10
Monthly Values				
<i>Mean</i>	0.014	0.000	0.103	1178
<i>Min.</i>	0.000	0.000	0.000	0
<i>Max.</i>	0.262	0.000	1.470	22642

Total Discharge: 36509 Cubic Feet

KEY: BD = bad data; *italics* = estimated data from field observations and discharge record at adjacent gages

Bad data can be attributed to equipment failures and winter freezing conditions.

Figure 3-25. GS28 Monthly Discharge

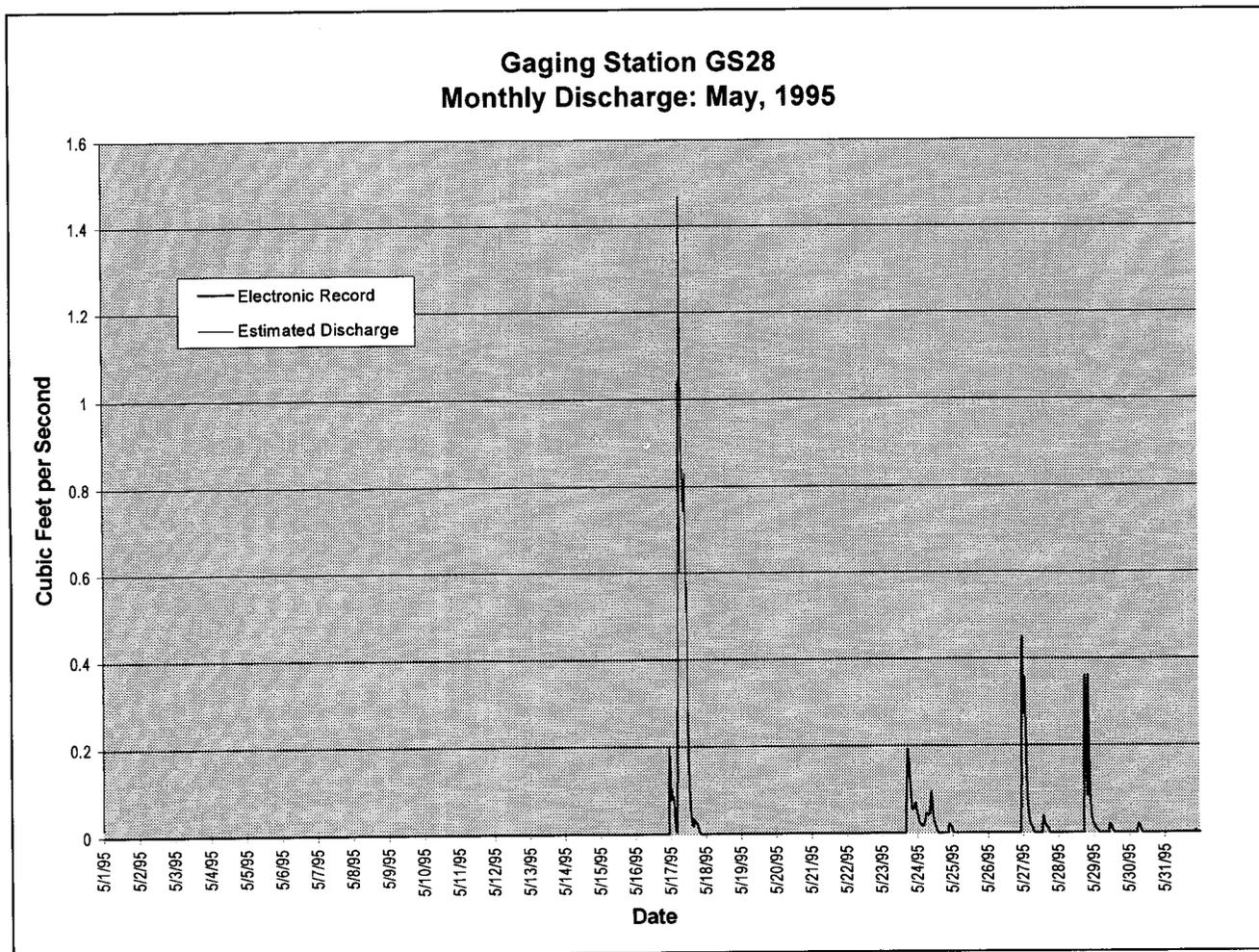
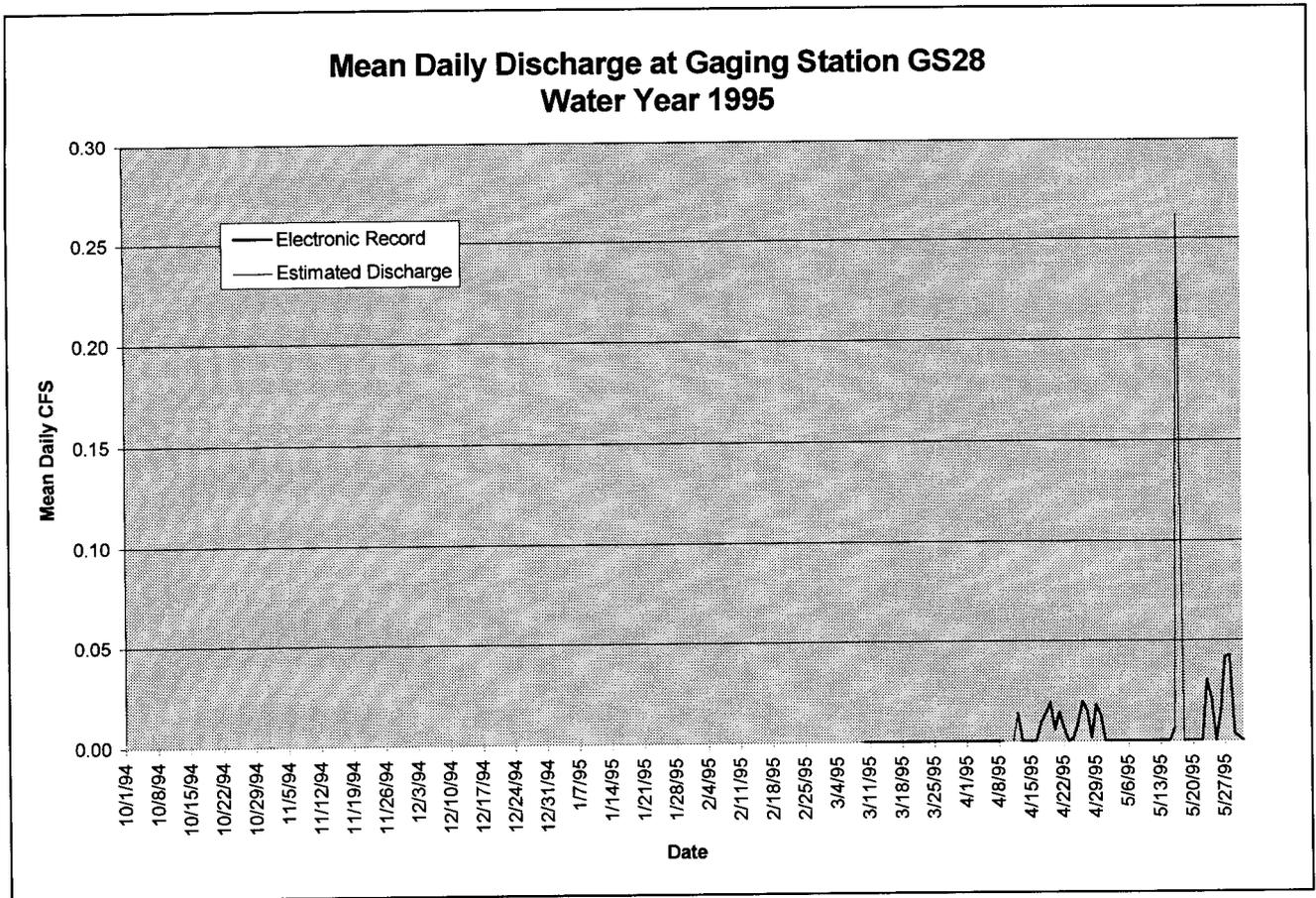


Figure 3-26. GS28 Mean Daily Discharge, Water Year 1995



Analytical Results

No analytical results compiled to date.

58
58