
Stormwater Quality

The project will meet the City of Central Point's and the Rogue Valley Sewer Service's requirements for stormwater quality. The stormwater runoff from the proposed improvements will be treated by utilizing a combination of treatment methods. The treatment methods proposed for the project are:

- Stormwater Planters
- Rain Gardens/Bio-Cells
- Filter strips
- EcoStorm/EcoStorm Plus treatment trains (TAPE Approved).

Treated flows will then be released into the underground detention facilities or to the storm pipe network as required to achieve flow control requirements for the site.

The total on-site impervious created by the proposed improvements is estimated to be of the order of 10.07 acres (438,649 SF). This includes about 0.34 acres (15,000 SF) of walkway within the proposed park area and about 3.82 acres (166,400 SF) of roof area throughout the site.

The treatment approach utilized for the impervious surfaces within the park area will be filter strips. About 1,250 LF of filter strips directly adjacent to the park's walkways, and paved areas will treat the runoff from these surfaces. The Peak Water Quality Flow Rate from this 0.34 acres of impervious surface is about 0.1cfs with a total Water Quality Volume of about 974 cubic-feet. The 1,250 LF of filter strip will easily address water quality for these areas.

The remainder of the site's impervious area will be treated by either an EcoStorm/EcoStorm Plus treatment train installed directly up-stream of the proposed detention facility, or by Rain Garden/Bio-Cells and stormwater planters strategically located throughout the roadway and parking areas, picking up gutter flows and treating them prior to discharge to the detention facilities.

The EcoStorm/EcoStorm Plus treatment train system will treat runoff from the Park Lane & Row Homes area. This area consists of about 2.55 acres of impervious. Since this treatment system is installed down-stream of the detention, it will be sized to treat the full 2-year release rate for the detention facility. The full 2-year release rate for the entire 3.9 acre area is estimated to be about 0.5 cfs. The full 2-year release rate is based on a $T_c = 25$ min, Precipitation = 2 inches, CN = 86, Total area = 3.9 acres, Impervious area = 0. The EcoStorm Model Number 0.5 has a treatment capacity of 0.83 cfs which is adequate for treatment. The EcoStorm Plus has a treatment capacity of 0.4 cfs therefore two units will be required to treat the flow.

The EcoStorm/EcoStorm Plus and Rain Gardens/Bio-Cells will be utilized to treat the stormwater runoff from the remainder of the site which includes Beebe Park Dr, White Hawk Way and the apartment site. The rain garden/Bio-Cells will be sized as 9% of the total area of the parking lot and sidewalks that drain into them approximately 2 acres. The EcoStorm/EcoStorm Plus treatment train system will treat the remainder of the run off from 5.18 acres of new impervious surfaces. With a total effective area of 10.93 acres and effective impervious area of 5.18 acres, the peak water quality flow rate is estimated to be about 1.1 cfs with a total volume of 18,824 cubic-feet. Three EcoStorm Plus units with a capacity of 1.2 total cfs will be used to treat the runoff.

Water Quantity

The project will meet the City of Central Point's and the Rogue Valley Sewer Service's requirements for water quantity. The stormwater for the proposed on-site improvements will be detained and released by four (3) independent detention systems and flow control structures located throughout the site. Two of the detention facilities are to be located within the apartment site area and will manage flow control for the Beebe Park Dr, White Hawk Way, & Apartment Site area. These two detention systems will utilize banks of StormTech DC-780 Chambers. A detention pipe system will manage the

flow control for the combined Park Area and Park Lane & Row Homes area.

The Beebe Park Dr, White Hawk Way, & Apartment Site area estimated Pre-Development and Post-Development peak flows and storm volumes are summarized below:

	Total Area (acres)	Impervious Area (acres)	Peak Flow (cfs)	Total Volume (cf)
Pre Development	10.93	0.00	2.8	64,416
Post Development	10.93	7.18	6.5	94,330

The storage volume require to mitigate the 10-year Post-Development flows to 10-year Pre-development flows is estimated to be about 10,000 cf of storage. Utilizing the StormTech DC-780 Chambers with a storage capacity of about 78 cf per unit, it is estimated that about 130 units will be adequate to provide the needed storage to mitigate post-development flows to pre-development levels. Each of the three banks proposed will consist of about 65 StormTech DC-780 Chambers.

The combined Park Area and Park Lane & Row Homes area estimated Pre-Development and Post-Development peak flows and storm volumes are summarized below:

	Total Area (acres)	Impervious Area (acres)	Peak Flow (cfs)	Total Volume (cf)
Pre Development	7.84	0.0	1.9	46,089
Post Development	7.84	2.89	4.0	58,603

The storage volume require to mitigate the 10-year Post-Development flows to 10-year Pre-development flows is estimated to be about 5,000 cf of storage. Utilizing about 710 LF of 36" detention pipe, about 5,000 cf of storage can be provided for this area.

Flows being released from the proposed detention facilities by flow control structures sized during final design. The proposed storm system will be designed with a 25-year design conveyance capacity.

Stormwater Disposal

All stormwater runoff for the proposed site improvements will be treated and detained, then released at pre-development flow rates into the public storm system in Beebe Street, or released directly to Bear Creek through the new discharge structure proposed for this project at Bear Creek.

WHITE HAWK
37 2W 02, TAXLOTS 2700 & 2979
PEOPLE'S BANK OF COMMERCE
1311 E BARNETT ROAD
MEDFORD, OR 97504
PH: (541) 774-7656

CES NW
13190 SW 68th Parkway, Suite 150
Tigard, Oregon 97223
503.968.6655 www.cesnw.com

REVISIONS

07/16/14

DATE: ARW

LOD: ARW

PROJECT NO. DESIGNED BY:

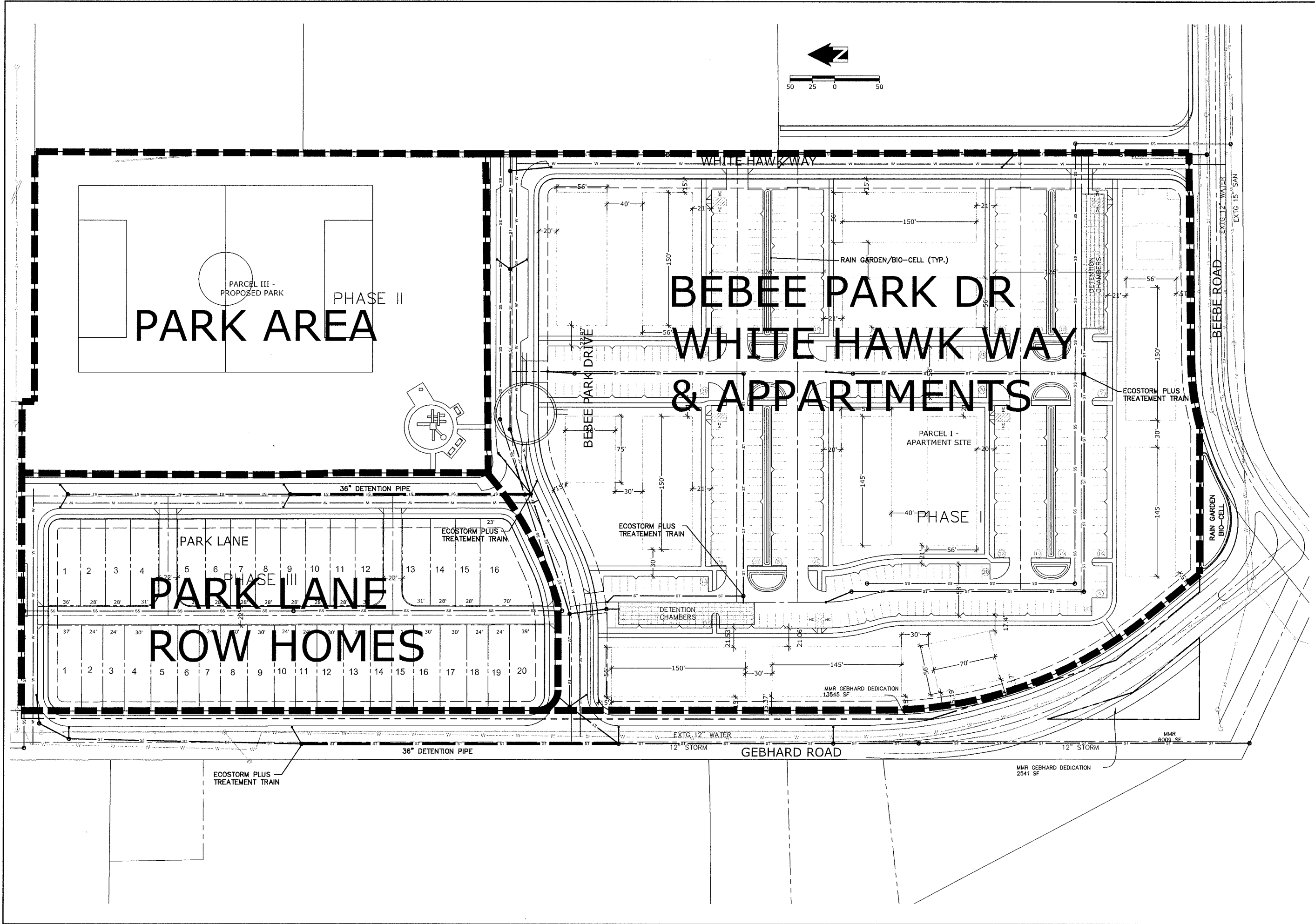
SITE DRAINAGE
AREA PLAN

SHEET

7

OF

7



Given:

Area = 0.34 acres
Pt = 1 inches
dt = 10 min.
Tc = 5 min.
w = 0.5000 routing constant

Pervious Area

Area = 0 acres
CN = 86
S = 1.63
0.2S = 0.33

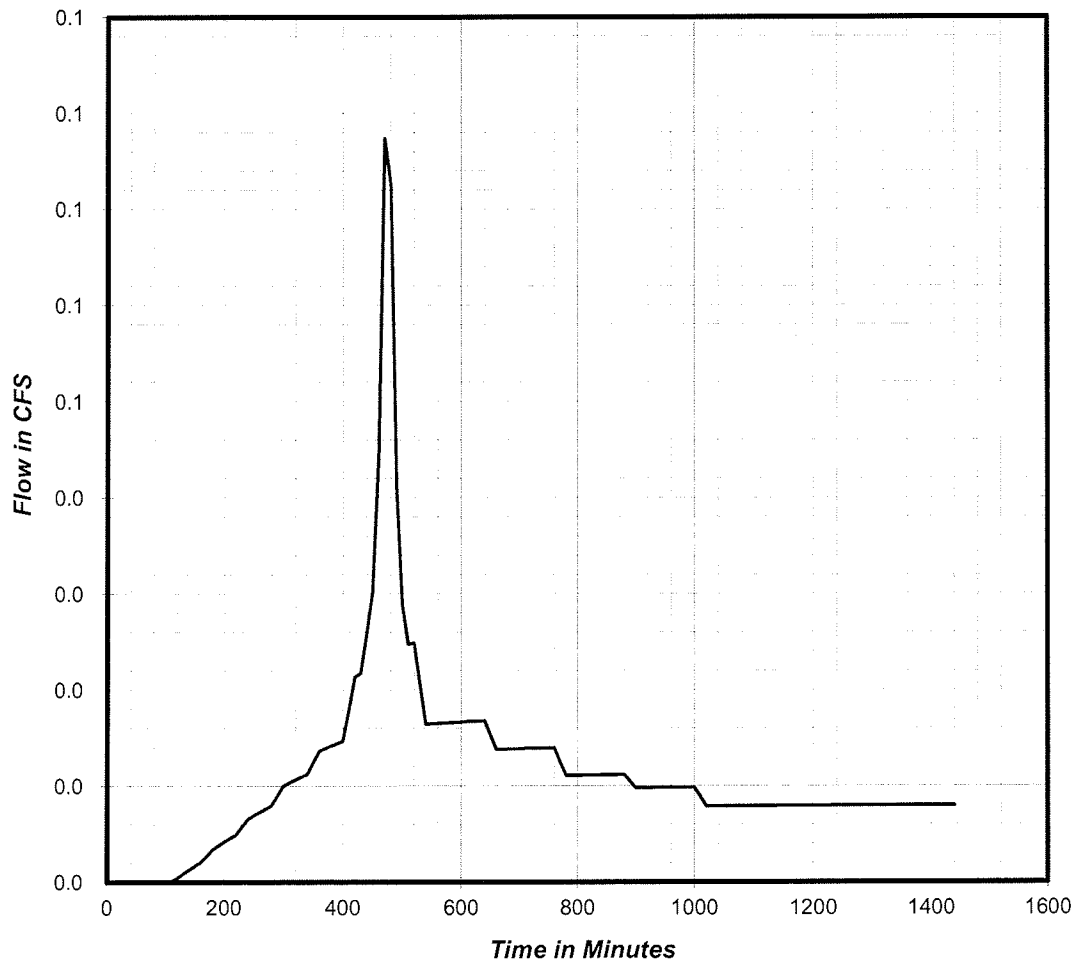
Impervious Area

Area = 0.34 acres
CN = 98
S = 0.20
0.2S = 0.04

HYDROGRAPH RESULTS

Peak Runoff 0.1 cfs
Total Vol. : 974 cf

Peak Runoff Hydrograph



(1) Time Increment	(2) Time (Min)	(3) Rainfall Distribu- tion (% of Pt)	(4) Incre- mental Rainfall (in)	Pervious Area			Impervious Area			(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)
				(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)				
1	10	0.0040	0.0040	0.0040	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0	
2	20	0.0040	0.0040	0.0080	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0	
3	30	0.0040	0.0040	0.0120	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0	
4	40	0.0040	0.0040	0.0160	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0	
5	50	0.0040	0.0040	0.0200	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0	
6	60	0.0040	0.0040	0.0240	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0	
7	70	0.0040	0.0040	0.0280	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0	
8	80	0.0040	0.0040	0.0320	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0	
9	90	0.0040	0.0040	0.0360	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0	
10	100	0.0040	0.0040	0.0400	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0	
11	110	0.0050	0.0050	0.0450	0.0000	0.0000	0.0001	0.0001	0.0001	0.0	0.0	
12	120	0.0050	0.0050	0.0500	0.0000	0.0000	0.0004	0.0003	0.0003	0.0	0.0	
13	130	0.0050	0.0050	0.0550	0.0000	0.0000	0.0009	0.0005	0.0005	0.0	0.0	
14	140	0.0050	0.0050	0.0600	0.0000	0.0000	0.0016	0.0007	0.0007	0.0	0.0	
15	150	0.0050	0.0050	0.0650	0.0000	0.0000	0.0026	0.0009	0.0009	0.0	0.0	
16	160	0.0050	0.0050	0.0700	0.0000	0.0000	0.0037	0.0011	0.0011	0.0	0.0	
17	170	0.0060	0.0060	0.0760	0.0000	0.0000	0.0052	0.0015	0.0015	0.0	0.0	
18	180	0.0060	0.0060	0.0820	0.0000	0.0000	0.0069	0.0017	0.0017	0.0	0.0	
19	190	0.0060	0.0060	0.0880	0.0000	0.0000	0.0089	0.0019	0.0019	0.0	0.0	
20	200	0.0060	0.0060	0.0940	0.0000	0.0000	0.0110	0.0021	0.0021	0.0	0.0	
21	210	0.0060	0.0060	0.1000	0.0000	0.0000	0.0133	0.0023	0.0023	0.0	0.0	
22	220	0.0060	0.0060	0.1060	0.0000	0.0000	0.0158	0.0025	0.0025	0.0	0.0	
23	230	0.0070	0.0070	0.1130	0.0000	0.0000	0.0189	0.0031	0.0031	0.0	0.0	
24	240	0.0070	0.0070	0.1200	0.0000	0.0000	0.0221	0.0033	0.0033	0.0	0.0	
25	250	0.0070	0.0070	0.1270	0.0000	0.0000	0.0256	0.0035	0.0035	0.0	0.0	
26	260	0.0070	0.0070	0.1340	0.0000	0.0000	0.0292	0.0036	0.0036	0.0	0.0	
27	270	0.0070	0.0070	0.1410	0.0000	0.0000	0.0330	0.0038	0.0038	0.0	0.0	
28	280	0.0070	0.0070	0.1480	0.0000	0.0000	0.0369	0.0039	0.0039	0.0	0.0	
29	290	0.0082	0.0082	0.1562	0.0000	0.0000	0.0417	0.0048	0.0048	0.0	0.0	
30	300	0.0082	0.0082	0.1644	0.0000	0.0000	0.0466	0.0049	0.0049	0.0	0.0	
31	310	0.0082	0.0082	0.1726	0.0000	0.0000	0.0517	0.0051	0.0051	0.0	0.0	
32	320	0.0082	0.0082	0.1808	0.0000	0.0000	0.0570	0.0052	0.0052	0.0	0.0	
33	330	0.0082	0.0082	0.1890	0.0000	0.0000	0.0623	0.0054	0.0054	0.0	0.0	
34	340	0.0082	0.0082	0.1972	0.0000	0.0000	0.0678	0.0055	0.0055	0.0	0.0	
35	350	0.0095	0.0095	0.2067	0.0000	0.0000	0.0744	0.0065	0.0065	0.0	0.0	
36	360	0.0095	0.0095	0.2162	0.0000	0.0000	0.0811	0.0067	0.0067	0.0	0.0	
37	370	0.0095	0.0095	0.2257	0.0000	0.0000	0.0879	0.0068	0.0068	0.0	0.0	
38	380	0.0095	0.0095	0.2352	0.0000	0.0000	0.0948	0.0069	0.0069	0.0	0.0	
39	390	0.0095	0.0095	0.2447	0.0000	0.0000	0.1019	0.0071	0.0071	0.0	0.0	
40	400	0.0095	0.0095	0.2542	0.0000	0.0000	0.1091	0.0072	0.0072	0.0	0.0	
41	410	0.0134	0.0134	0.2676	0.0000	0.0000	0.1194	0.0103	0.0103	0.0	0.0	
42	420	0.0134	0.0134	0.2810	0.0000	0.0000	0.1299	0.0105	0.0105	0.0	0.0	
43	430	0.0134	0.0134	0.2944	0.0000	0.0000	0.1405	0.0107	0.0107	0.0	0.0	
44	440	0.0180	0.0180	0.3124	0.0000	0.0000	0.1551	0.0146	0.0146	0.0	0.0	
45	450	0.0180	0.0180	0.3304	0.0000	0.0000	0.1699	0.0148	0.0148	0.0	0.0	
46	460	0.0340	0.0340	0.3644	0.0009	0.0009	0.1984	0.0286	0.0286	0.1	0.0	
47	470	0.0540	0.0540	0.4184	0.0050	0.0041	0.2451	0.0467	0.0467	0.1	0.1	
48	480	0.0270	0.0270	0.4454	0.0082	0.0032	0.2689	0.0238	0.0238	0.0	0.1	
49	490	0.0180	0.0180	0.4634	0.0108	0.0025	0.2850	0.0160	0.0160	0.0	0.0	
50	500	0.0134	0.0134	0.4768	0.0129	0.0021	0.2970	0.0120	0.0120	0.0	0.0	
51	510	0.0134	0.0134	0.4902	0.0151	0.0023	0.3090	0.0121	0.0121	0.0	0.0	
52	520	0.0134	0.0134	0.5036	0.0175	0.0024	0.3212	0.0121	0.0121	0.0	0.0	
53	530	0.0088	0.0088	0.5124	0.0192	0.0017	0.3291	0.0080	0.0080	0.0	0.0	
54	540	0.0088	0.0088	0.5212	0.0210	0.0018	0.3372	0.0080	0.0080	0.0	0.0	
55	550	0.0088	0.0088	0.5300	0.0228	0.0018	0.3452	0.0080	0.0080	0.0	0.0	
56	560	0.0088	0.0088	0.5388	0.0247	0.0019	0.3532	0.0080	0.0080	0.0	0.0	
57	570	0.0088	0.0088	0.5476	0.0266	0.0020	0.3613	0.0081	0.0081	0.0	0.0	
58	580	0.0088	0.0088	0.5564	0.0287	0.0020	0.3694	0.0081	0.0081	0.0	0.0	
59	590	0.0088	0.0088	0.5652	0.0307	0.0021	0.3775	0.0081	0.0081	0.0	0.0	
60	600	0.0088	0.0088	0.5740	0.0329	0.0021	0.3856	0.0081	0.0081	0.0	0.0	
61	610	0.0088	0.0088	0.5828	0.0351	0.0022	0.3937	0.0081	0.0081	0.0	0.0	
62	620	0.0088	0.0088	0.5916	0.0374	0.0023	0.4019	0.0081	0.0081	0.0	0.0	
63	630	0.0088	0.0088	0.6004	0.0397	0.0023	0.4100	0.0082	0.0082	0.0	0.0	
64	640	0.0088	0.0088	0.6092	0.0421	0.0024	0.4182	0.0082	0.0082	0.0	0.0	
65	650	0.0072	0.0072	0.6164	0.0441	0.0020	0.4249	0.0067	0.0067	0.0	0.0	
66	660	0.0072	0.0072	0.6236	0.0461	0.0020	0.4316	0.0067	0.0067	0.0	0.0	
67	670	0.0072	0.0072	0.6308	0.0482	0.0021	0.4384	0.0067	0.0067	0.0	0.0	
68	680	0.0072	0.0072	0.6380	0.0503	0.0021	0.4451	0.0067	0.0067	0.0	0.0	

(1) Time Increment	(2) Time (Min)	(3) Rainfall Distri- bution (% of Pt)	(4) Incre- mental Rainfall (in)	(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)	(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)
69	690	0.0072	0.0072	0.6452	0.0525	0.0022	0.4518	0.0067	0.0067	0.0	0.0
70	700	0.0072	0.0072	0.6524	0.0546	0.0022	0.4586	0.0067	0.0067	0.0	0.0
71	710	0.0072	0.0072	0.6596	0.0569	0.0022	0.4653	0.0068	0.0068	0.0	0.0

(1) Time Increment	(2) Time (Min)	(3) Rainfall Distri- bution (% of Pt)	(4) Incre- mental Rainfall (in)	(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)	(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)
72	720	0.0072	0.0072	0.6668	0.0591	0.0023	0.4721	0.0068	0.0068	0.0	0.0
73	730	0.0072	0.0072	0.6740	0.0614	0.0023	0.4788	0.0068	0.0068	0.0	0.0
74	740	0.0072	0.0072	0.6812	0.0638	0.0023	0.4856	0.0068	0.0068	0.0	0.0
75	750	0.0072	0.0072	0.6884	0.0661	0.0024	0.4924	0.0068	0.0068	0.0	0.0
76	760	0.0072	0.0072	0.6956	0.0685	0.0024	0.4992	0.0068	0.0068	0.0	0.0
77	770	0.0057	0.0057	0.7013	0.0705	0.0019	0.5046	0.0054	0.0054	0.0	0.0
78	780	0.0057	0.0057	0.7070	0.0724	0.0019	0.5100	0.0054	0.0054	0.0	0.0
79	790	0.0057	0.0057	0.7127	0.0744	0.0020	0.5153	0.0054	0.0054	0.0	0.0
80	800	0.0057	0.0057	0.7184	0.0764	0.0020	0.5207	0.0054	0.0054	0.0	0.0
81	810	0.0057	0.0057	0.7241	0.0784	0.0020	0.5261	0.0054	0.0054	0.0	0.0
82	820	0.0057	0.0057	0.7298	0.0804	0.0020	0.5315	0.0054	0.0054	0.0	0.0
83	830	0.0057	0.0057	0.7355	0.0825	0.0021	0.5369	0.0054	0.0054	0.0	0.0
84	840	0.0057	0.0057	0.7412	0.0845	0.0021	0.5424	0.0054	0.0054	0.0	0.0
85	850	0.0057	0.0057	0.7469	0.0866	0.0021	0.5478	0.0054	0.0054	0.0	0.0
86	860	0.0057	0.0057	0.7526	0.0887	0.0021	0.5532	0.0054	0.0054	0.0	0.0
87	870	0.0057	0.0057	0.7583	0.0909	0.0021	0.5586	0.0054	0.0054	0.0	0.0
88	880	0.0057	0.0057	0.7640	0.0930	0.0022	0.5640	0.0054	0.0054	0.0	0.0
89	890	0.0050	0.0050	0.7690	0.0949	0.0019	0.5688	0.0048	0.0048	0.0	0.0
90	900	0.0050	0.0050	0.7740	0.0968	0.0019	0.5735	0.0048	0.0048	0.0	0.0
91	910	0.0050	0.0050	0.7790	0.0988	0.0019	0.5783	0.0048	0.0048	0.0	0.0
92	920	0.0050	0.0050	0.7840	0.1007	0.0019	0.5831	0.0048	0.0048	0.0	0.0
93	930	0.0050	0.0050	0.7890	0.1027	0.0020	0.5878	0.0048	0.0048	0.0	0.0
94	940	0.0050	0.0050	0.7940	0.1047	0.0020	0.5926	0.0048	0.0048	0.0	0.0
95	950	0.0050	0.0050	0.7990	0.1067	0.0020	0.5974	0.0048	0.0048	0.0	0.0
96	960	0.0050	0.0050	0.8040	0.1087	0.0020	0.6022	0.0048	0.0048	0.0	0.0
97	970	0.0050	0.0050	0.8090	0.1107	0.0020	0.6069	0.0048	0.0048	0.0	0.0
98	980	0.0050	0.0050	0.8140	0.1127	0.0020	0.6117	0.0048	0.0048	0.0	0.0
99	990	0.0050	0.0050	0.8190	0.1148	0.0020	0.6165	0.0048	0.0048	0.0	0.0
100	1000	0.0050	0.0050	0.8240	0.1168	0.0021	0.6213	0.0048	0.0048	0.0	0.0
101	1010	0.0040	0.0040	0.8280	0.1185	0.0017	0.6251	0.0038	0.0038	0.0	0.0
102	1020	0.0040	0.0040	0.8320	0.1202	0.0017	0.6289	0.0038	0.0038	0.0	0.0
103	1030	0.0040	0.0040	0.8360	0.1218	0.0017	0.6328	0.0038	0.0038	0.0	0.0
104	1040	0.0040	0.0040	0.8400	0.1235	0.0017	0.6366	0.0038	0.0038	0.0	0.0
105	1050	0.0040	0.0040	0.8440	0.1252	0.0017	0.6405	0.0038	0.0038	0.0	0.0
106	1060	0.0040	0.0040	0.8480	0.1269	0.0017	0.6443	0.0038	0.0038	0.0	0.0
107	1070	0.0040	0.0040	0.8520	0.1286	0.0017	0.6481	0.0038	0.0038	0.0	0.0
108	1080	0.0040	0.0040	0.8560	0.1304	0.0017	0.6520	0.0038	0.0038	0.0	0.0
109	1090	0.0040	0.0040	0.8600	0.1321	0.0017	0.6558	0.0038	0.0038	0.0	0.0
110	1100	0.0040	0.0040	0.8640	0.1338	0.0017	0.6596	0.0038	0.0038	0.0	0.0
111	1110	0.0040	0.0040	0.8680	0.1356	0.0017	0.6635	0.0038	0.0038	0.0	0.0
112	1120	0.0040	0.0040	0.8720	0.1373	0.0018	0.6673	0.0038	0.0038	0.0	0.0
113	1130	0.0040	0.0040	0.8760	0.1391	0.0018	0.6712	0.0038	0.0038	0.0	0.0
114	1140	0.0040	0.0040	0.8800	0.1408	0.0018	0.6750	0.0038	0.0038	0.0	0.0
115	1150	0.0040	0.0040	0.8840	0.1426	0.0018	0.6789	0.0038	0.0038	0.0	0.0
116	1160	0.0040	0.0040	0.8880	0.1444	0.0018	0.6827	0.0038	0.0038	0.0	0.0
117	1170	0.0040	0.0040	0.8920	0.1462	0.0018	0.6866	0.0038	0.0038	0.0	0.0
118	1180	0.0040	0.0040	0.8960	0.1480	0.0018	0.6904	0.0039	0.0039	0.0	0.0
119	1190	0.0040	0.0040	0.9000	0.1498	0.0018	0.6943	0.0039	0.0039	0.0	0.0
120	1200	0.0040	0.0040	0.9040	0.1516	0.0018	0.6981	0.0039	0.0039	0.0	0.0
121	1210	0.0040	0.0040	0.9080	0.1535	0.0018	0.7020	0.0039	0.0039	0.0	0.0
122	1220	0.0040	0.0040	0.9120	0.1553	0.0018	0.7058	0.0039	0.0039	0.0	0.0
123	1230	0.0040	0.0040	0.9160	0.1571	0.0018	0.7097	0.0039	0.0039	0.0	0.0
124	1240	0.0040	0.0040	0.9200	0.1590	0.0018	0.7135	0.0039	0.0039	0.0	0.0
125	1250	0.0040	0.0040	0.9240	0.1609	0.0019	0.7174	0.0039	0.0039	0.0	0.0
126	1260	0.0040	0.0040	0.9280	0.1627	0.0019	0.7213	0.0039	0.0039	0.0	0.0
127	1270	0.0040	0.0040	0.9320	0.1646	0.0019	0.7251	0.0039	0.0039	0.0	0.0
128	1280	0.0040	0.0040	0.9360	0.1665	0.0019	0.7290	0.0039	0.0039	0.0	0.0
129	1290	0.0040	0.0040	0.9400	0.1684	0.0019	0.7329	0.0039	0.0039	0.0	0.0
130	1300	0.0040	0.0040	0.9440	0.1703	0.0019	0.7367	0.0039	0.0039	0.0	0.0
131	1310	0.0040	0.0040	0.9480	0.1722	0.0019	0.7406	0.0039	0.0039	0.0	0.0
132	1320	0.0040	0.0040	0.9520	0.1741	0.0019	0.7444	0.0039	0.0039	0.0	0.0
133	1330	0.0040	0.0040	0.9560	0.1760	0.0019	0.7483	0.0039	0.0039	0.0	0.0
134	1340	0.0040	0.0040	0.9600	0.1779	0.0019	0.7522	0.0039	0.0039	0.0	0.0
135	1350	0.0040	0.0040	0.9640	0.1798	0.0019	0.7560	0.0039	0.0039	0.0	0.0
136	1360	0.0040	0.0040	0.9680	0.1818	0.0019	0.7599	0.0039	0.0039	0.0	0.0
137	1370	0.0040	0.0040	0.9720	0.1837	0.0019	0.7638	0.0039	0.0039	0.0	0.0
138	1380	0.0040	0.0040	0.9760	0.1857	0.0020	0.7677	0.0039	0.0039	0.0	0.0
139	1390	0.0040	0.0040	0.9800	0.1876	0.0020	0.7715	0.0039	0.0039	0.0	0.0
140	1400	0.0040	0.0040	0.9840	0.1896	0.0020	0.7754	0.0039	0.0039	0.0	0.0
141	1410	0.0040	0.0040	0.9880	0.1916	0.0020	0.7793	0.0039	0.0039	0.0	0.0

(1) Time Incre- ment	(2) Time (Min)	(3) Rainfall Distri- bution (% of Pt)	(4) Incre- mental Rainfall (in)	(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)	(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)
142	1420	0.0040	0.0040	0.9920	0.1936	0.0020	0.7832	0.0039	0.0039	0.0	0.0
143	1430	0.0040	0.0040	0.9960	0.1956	0.0020	0.7870	0.0039	0.0039	0.0	0.0
144	1440	0.0040	0.0040	1.0000	0.1976	0.0020	0.7909	0.0039	0.0039	0.0	0.0
Total		1.0000	1.0000							Hydrograph Volume (Cubic Feet) 974	

Given:

Area = 3.62 acres
Pt = 2 inches
dt = 10 min.
Tc = 30 min.
w = 0.1429 routing constant

Pervious Area

Area = 3.62 acres
CN = 86
S = 1.63
0.2S = 0.33

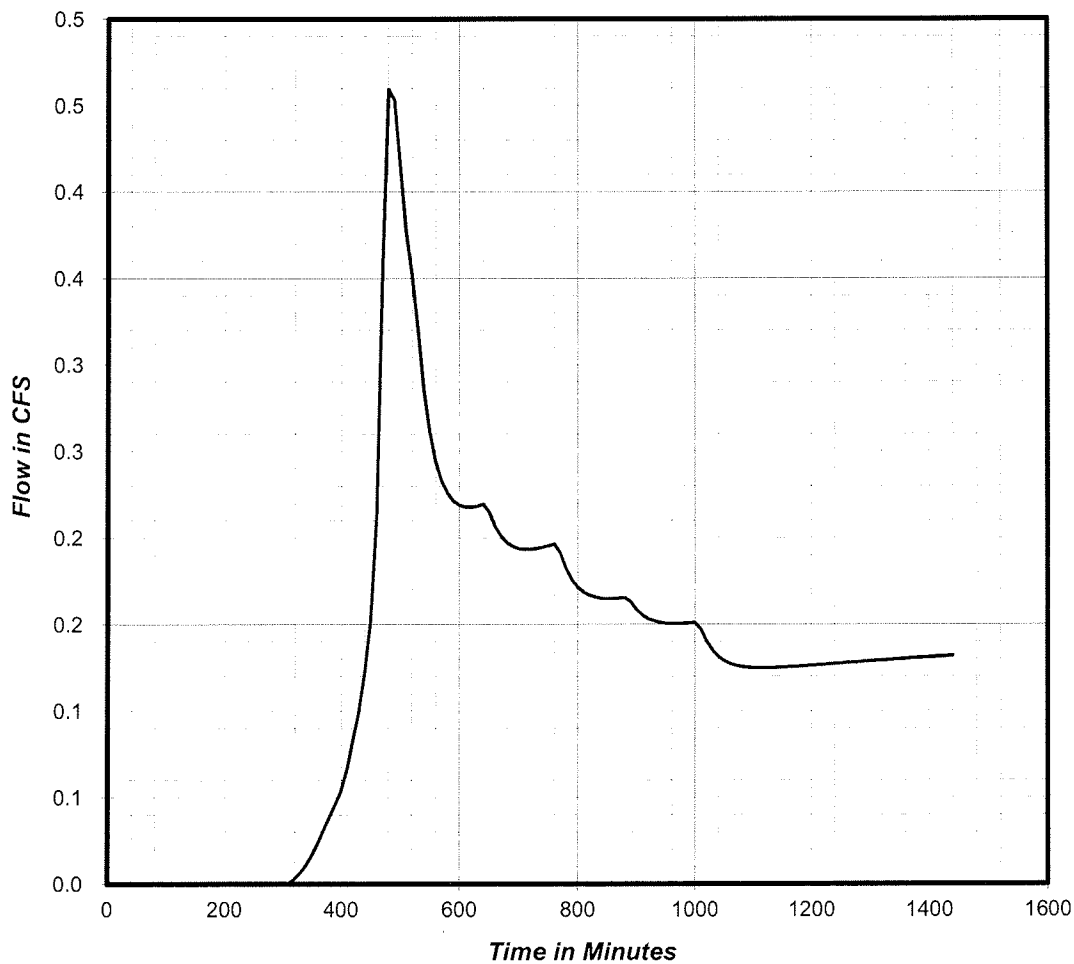
Impervious Area

Area = 0 acres
CN = 98
S = 0.20
0.2S = 0.04

HYDROGRAPH RESULTS

Peak Runoff: 0.5 cfs
Total Vol.: 10919 cf

Peak Runoff Hydrograph



(1) Time Increment	(2) Time (Min)	(3) Rainfall Distribution (% of Pt)	(4) Incre- mental Rainfall (in)	Pervious Area			Impervious Area			(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)
				(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)				
1	10	0.0040	0.0080	0.0080	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0
2	20	0.0040	0.0080	0.0160	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0
3	30	0.0040	0.0080	0.0240	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0
4	40	0.0040	0.0080	0.0320	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0
5	50	0.0040	0.0080	0.0400	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0
6	60	0.0040	0.0080	0.0480	0.0000	0.0000	0.0002	0.0002	0.0002	0.0000	0.0	0.0
7	70	0.0040	0.0080	0.0560	0.0000	0.0000	0.0011	0.0008	0.0008	0.0000	0.0	0.0
8	80	0.0040	0.0080	0.0640	0.0000	0.0000	0.0024	0.0013	0.0013	0.0000	0.0	0.0
9	90	0.0040	0.0080	0.0720	0.0000	0.0000	0.0041	0.0018	0.0018	0.0000	0.0	0.0
10	100	0.0040	0.0080	0.0800	0.0000	0.0000	0.0063	0.0022	0.0022	0.0000	0.0	0.0
11	110	0.0050	0.0100	0.0900	0.0000	0.0000	0.0096	0.0032	0.0032	0.0000	0.0	0.0
12	120	0.0050	0.0100	0.1000	0.0000	0.0000	0.0133	0.0038	0.0038	0.0000	0.0	0.0
13	130	0.0050	0.0100	0.1100	0.0000	0.0000	0.0175	0.0042	0.0042	0.0000	0.0	0.0
14	140	0.0050	0.0100	0.1200	0.0000	0.0000	0.0221	0.0046	0.0046	0.0000	0.0	0.0
15	150	0.0050	0.0100	0.1300	0.0000	0.0000	0.0271	0.0050	0.0050	0.0000	0.0	0.0
16	160	0.0050	0.0100	0.1400	0.0000	0.0000	0.0324	0.0053	0.0053	0.0000	0.0	0.0
17	170	0.0060	0.0120	0.1520	0.0000	0.0000	0.0392	0.0068	0.0068	0.0000	0.0	0.0
18	180	0.0060	0.0120	0.1640	0.0000	0.0000	0.0464	0.0072	0.0072	0.0000	0.0	0.0
19	190	0.0060	0.0120	0.1760	0.0000	0.0000	0.0539	0.0075	0.0075	0.0000	0.0	0.0
20	200	0.0060	0.0120	0.1880	0.0000	0.0000	0.0617	0.0078	0.0078	0.0000	0.0	0.0
21	210	0.0060	0.0120	0.2000	0.0000	0.0000	0.0698	0.0081	0.0081	0.0000	0.0	0.0
22	220	0.0060	0.0120	0.2120	0.0000	0.0000	0.0781	0.0083	0.0083	0.0000	0.0	0.0
23	230	0.0070	0.0140	0.2260	0.0000	0.0000	0.0881	0.0100	0.0100	0.0000	0.0	0.0
24	240	0.0070	0.0140	0.2400	0.0000	0.0000	0.0984	0.0103	0.0103	0.0000	0.0	0.0
25	250	0.0070	0.0140	0.2540	0.0000	0.0000	0.1089	0.0105	0.0105	0.0000	0.0	0.0
26	260	0.0070	0.0140	0.2680	0.0000	0.0000	0.1197	0.0108	0.0108	0.0000	0.0	0.0
27	270	0.0070	0.0140	0.2820	0.0000	0.0000	0.1306	0.0110	0.0110	0.0000	0.0	0.0
28	280	0.0070	0.0140	0.2960	0.0000	0.0000	0.1418	0.0111	0.0111	0.0000	0.0	0.0
29	290	0.0082	0.0164	0.3124	0.0000	0.0000	0.1551	0.0133	0.0133	0.0000	0.0	0.0
30	300	0.0082	0.0164	0.3288	0.0000	0.0000	0.1685	0.0135	0.0135	0.0000	0.0	0.0
31	310	0.0082	0.0164	0.3452	0.0002	0.0002	0.1822	0.0137	0.0137	0.0002	0.0	0.0
32	320	0.0082	0.0164	0.3616	0.0008	0.0005	0.1961	0.0138	0.0138	0.0005	0.0	0.0
33	330	0.0082	0.0164	0.3780	0.0016	0.0009	0.2101	0.0140	0.0140	0.0009	0.0	0.0
34	340	0.0082	0.0164	0.3944	0.0028	0.0012	0.2242	0.0141	0.0141	0.0012	0.0	0.0
35	350	0.0095	0.0190	0.4134	0.0045	0.0017	0.2407	0.0165	0.0165	0.0017	0.0	0.0
36	360	0.0095	0.0190	0.4324	0.0066	0.0021	0.2574	0.0167	0.0167	0.0021	0.0	0.0
37	370	0.0095	0.0190	0.4514	0.0090	0.0024	0.2743	0.0168	0.0168	0.0024	0.1	0.0
38	380	0.0095	0.0190	0.4704	0.0118	0.0028	0.2912	0.0170	0.0170	0.0028	0.1	0.0
39	390	0.0095	0.0190	0.4894	0.0150	0.0031	0.3083	0.0171	0.0171	0.0031	0.1	0.0
40	400	0.0095	0.0190	0.5084	0.0185	0.0035	0.3255	0.0172	0.0172	0.0035	0.1	0.1
41	410	0.0134	0.0268	0.5352	0.0239	0.0055	0.3499	0.0244	0.0244	0.0055	0.1	0.1
42	420	0.0134	0.0268	0.5620	0.0300	0.0061	0.3745	0.0246	0.0246	0.0061	0.1	0.1
43	430	0.0134	0.0268	0.5888	0.0366	0.0067	0.3993	0.0248	0.0248	0.0067	0.1	0.1
44	440	0.0180	0.0360	0.6248	0.0465	0.0098	0.4328	0.0335	0.0335	0.0098	0.2	0.1
45	450	0.0180	0.0360	0.6608	0.0572	0.0108	0.4664	0.0337	0.0337	0.0108	0.2	0.2
46	460	0.0340	0.0680	0.7288	0.0800	0.0228	0.5306	0.0641	0.0641	0.0228	0.5	0.2
47	470	0.0540	0.1080	0.8368	0.1222	0.0421	0.6335	0.1030	0.1030	0.0421	0.9	0.4
48	480	0.0270	0.0540	0.8908	0.1457	0.0235	0.6854	0.0519	0.0519	0.0235	0.5	0.5
49	490	0.0180	0.0360	0.9268	0.1622	0.0165	0.7201	0.0347	0.0347	0.0165	0.4	0.5
50	500	0.0134	0.0268	0.9536	0.1748	0.0127	0.7460	0.0259	0.0259	0.0127	0.3	0.4
51	510	0.0134	0.0268	0.9804	0.1878	0.0130	0.7719	0.0259	0.0259	0.0130	0.3	0.4
52	520	0.0134	0.0268	1.0072	0.2012	0.0133	0.7979	0.0260	0.0260	0.0133	0.3	0.4
53	530	0.0088	0.0176	1.0248	0.2101	0.0089	0.8150	0.0171	0.0171	0.0089	0.2	0.3
54	540	0.0088	0.0176	1.0424	0.2191	0.0091	0.8320	0.0171	0.0171	0.0091	0.2	0.3
55	550	0.0088	0.0176	1.0600	0.2283	0.0092	0.8491	0.0171	0.0171	0.0092	0.2	0.3
56	560	0.0088	0.0176	1.0776	0.2376	0.0093	0.8663	0.0171	0.0171	0.0093	0.2	0.2
57	570	0.0088	0.0176	1.0952	0.2471	0.0094	0.8834	0.0171	0.0171	0.0094	0.2	0.2
58	580	0.0088	0.0176	1.1128	0.2566	0.0095	0.9005	0.0171	0.0171	0.0095	0.2	0.2
59	590	0.0088	0.0176	1.1304	0.2663	0.0097	0.9177	0.0172	0.0172	0.0097	0.2	0.2
60	600	0.0088	0.0176	1.1480	0.2760	0.0098	0.9349	0.0172	0.0172	0.0098	0.2	0.2
61	610	0.0088	0.0176	1.1656	0.2859	0.0099	0.9520	0.0172	0.0172	0.0099	0.2	0.2
62	620	0.0088	0.0176	1.1832	0.2959	0.0100	0.9692	0.0172	0.0172	0.0100	0.2	0.2
63	630	0.0088	0.0176	1.2008	0.3060	0.0101	0.9864	0.0172	0.0172	0.0101	0.2	0.2
64	640	0.0088	0.0176	1.2184	0.3162	0.0102	1.0036	0.0172	0.0172	0.0102	0.2	0.2
65	650	0.0072	0.0144	1.2328	0.3247	0.0084	1.0177	0.0141	0.0141	0.0084	0.2	0.2
66	660	0.0072	0.0144	1.2472	0.3332	0.0085	1.0318	0.0141	0.0141	0.0085	0.2	0.2
67	670	0.0072	0.0144	1.2616	0.3417	0.0086	1.0459	0.0141	0.0141	0.0086	0.2	0.2
68	680	0.0072	0.0144	1.2760	0.3503	0.0086	1.0600	0.0141	0.0141	0.0086	0.2	0.2

(1) Time Increment	(2) Time (Min)	(3) Rainfall Distri- bution (% of Pt)	(4) Incre- mental Rainfall (in)	(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)	(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)
69	690	0.0072	0.0144	1.2904	0.3590	0.0087	1.0742	0.0141	0.0087	0.2	0.2
70	700	0.0072	0.0144	1.3048	0.3678	0.0088	1.0883	0.0141	0.0088	0.2	0.2
71	710	0.0072	0.0144	1.3192	0.3766	0.0088	1.1024	0.0141	0.0088	0.2	0.2

(1) Time Increment	(2) Time (Min)	(3) Rainfall Distri- bution (% of Pt)	(4) Incre- mental Rainfall (in)	(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)	(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)
72	720	0.0072	0.0144	1.3336	0.3855	0.0089	1.1165	0.0141	0.0089	0.2	0.2
73	730	0.0072	0.0144	1.3480	0.3944	0.0089	1.1307	0.0141	0.0089	0.2	0.2
74	740	0.0072	0.0144	1.3624	0.4034	0.0090	1.1448	0.0141	0.0090	0.2	0.2
75	750	0.0072	0.0144	1.3768	0.4125	0.0091	1.1589	0.0141	0.0091	0.2	0.2
76	760	0.0072	0.0144	1.3912	0.4216	0.0091	1.1731	0.0141	0.0091	0.2	0.2
77	770	0.0057	0.0114	1.4026	0.4288	0.0073	1.1843	0.0112	0.0073	0.2	0.2
78	780	0.0057	0.0114	1.4140	0.4361	0.0073	1.1955	0.0112	0.0073	0.2	0.2
79	790	0.0057	0.0114	1.4254	0.4434	0.0073	1.2067	0.0112	0.0073	0.2	0.2
80	800	0.0057	0.0114	1.4368	0.4508	0.0074	1.2179	0.0112	0.0074	0.2	0.2
81	810	0.0057	0.0114	1.4482	0.4582	0.0074	1.2291	0.0112	0.0074	0.2	0.2
82	820	0.0057	0.0114	1.4596	0.4656	0.0074	1.2404	0.0112	0.0074	0.2	0.2
83	830	0.0057	0.0114	1.4710	0.4731	0.0075	1.2516	0.0112	0.0075	0.2	0.2
84	840	0.0057	0.0114	1.4824	0.4806	0.0075	1.2628	0.0112	0.0075	0.2	0.2
85	850	0.0057	0.0114	1.4938	0.4881	0.0075	1.2740	0.0112	0.0075	0.2	0.2
86	860	0.0057	0.0114	1.5052	0.4956	0.0076	1.2853	0.0112	0.0076	0.2	0.2
87	870	0.0057	0.0114	1.5166	0.5032	0.0076	1.2965	0.0112	0.0076	0.2	0.2
88	880	0.0057	0.0114	1.5280	0.5108	0.0076	1.3077	0.0112	0.0076	0.2	0.2
89	890	0.0050	0.0100	1.5380	0.5175	0.0067	1.3176	0.0099	0.0067	0.1	0.2
90	900	0.0050	0.0100	1.5480	0.5243	0.0067	1.3274	0.0099	0.0067	0.1	0.2
91	910	0.0050	0.0100	1.5580	0.5310	0.0067	1.3373	0.0099	0.0067	0.1	0.2
92	920	0.0050	0.0100	1.5680	0.5378	0.0068	1.3472	0.0099	0.0068	0.1	0.2
93	930	0.0050	0.0100	1.5780	0.5446	0.0068	1.3570	0.0099	0.0068	0.1	0.2
94	940	0.0050	0.0100	1.5880	0.5514	0.0068	1.3669	0.0099	0.0068	0.1	0.2
95	950	0.0050	0.0100	1.5980	0.5582	0.0068	1.3767	0.0099	0.0068	0.1	0.2
96	960	0.0050	0.0100	1.6080	0.5651	0.0069	1.3866	0.0099	0.0069	0.2	0.2
97	970	0.0050	0.0100	1.6180	0.5720	0.0069	1.3965	0.0099	0.0069	0.2	0.2
98	980	0.0050	0.0100	1.6280	0.5789	0.0069	1.4064	0.0099	0.0069	0.2	0.2
99	990	0.0050	0.0100	1.6380	0.5858	0.0069	1.4162	0.0099	0.0069	0.2	0.2
100	1000	0.0050	0.0100	1.6480	0.5927	0.0069	1.4261	0.0099	0.0069	0.2	0.2
101	1010	0.0040	0.0080	1.6560	0.5983	0.0056	1.4340	0.0079	0.0056	0.1	0.1
102	1020	0.0040	0.0080	1.6640	0.6039	0.0056	1.4419	0.0079	0.0056	0.1	0.1
103	1030	0.0040	0.0080	1.6720	0.6095	0.0056	1.4498	0.0079	0.0056	0.1	0.1
104	1040	0.0040	0.0080	1.6800	0.6151	0.0056	1.4577	0.0079	0.0056	0.1	0.1
105	1050	0.0040	0.0080	1.6880	0.6207	0.0056	1.4656	0.0079	0.0056	0.1	0.1
106	1060	0.0040	0.0080	1.6960	0.6264	0.0056	1.4735	0.0079	0.0056	0.1	0.1
107	1070	0.0040	0.0080	1.7040	0.6320	0.0056	1.4814	0.0079	0.0056	0.1	0.1
108	1080	0.0040	0.0080	1.7120	0.6377	0.0057	1.4893	0.0079	0.0057	0.1	0.1
109	1090	0.0040	0.0080	1.7200	0.6433	0.0057	1.4972	0.0079	0.0057	0.1	0.1
110	1100	0.0040	0.0080	1.7280	0.6490	0.0057	1.5051	0.0079	0.0057	0.1	0.1
111	1110	0.0040	0.0080	1.7360	0.6547	0.0057	1.5130	0.0079	0.0057	0.1	0.1
112	1120	0.0040	0.0080	1.7440	0.6604	0.0057	1.5209	0.0079	0.0057	0.1	0.1
113	1130	0.0040	0.0080	1.7520	0.6662	0.0057	1.5288	0.0079	0.0057	0.1	0.1
114	1140	0.0040	0.0080	1.7600	0.6719	0.0057	1.5368	0.0079	0.0057	0.1	0.1
115	1150	0.0040	0.0080	1.7680	0.6776	0.0057	1.5447	0.0079	0.0057	0.1	0.1
116	1160	0.0040	0.0080	1.7760	0.6834	0.0058	1.5526	0.0079	0.0058	0.1	0.1
117	1170	0.0040	0.0080	1.7840	0.6892	0.0058	1.5605	0.0079	0.0058	0.1	0.1
118	1180	0.0040	0.0080	1.7920	0.6949	0.0058	1.5684	0.0079	0.0058	0.1	0.1
119	1190	0.0040	0.0080	1.8000	0.7007	0.0058	1.5763	0.0079	0.0058	0.1	0.1
120	1200	0.0040	0.0080	1.8080	0.7065	0.0058	1.5842	0.0079	0.0058	0.1	0.1
121	1210	0.0040	0.0080	1.8160	0.7124	0.0058	1.5921	0.0079	0.0058	0.1	0.1
122	1220	0.0040	0.0080	1.8240	0.7182	0.0058	1.6001	0.0079	0.0058	0.1	0.1
123	1230	0.0040	0.0080	1.8320	0.7240	0.0058	1.6080	0.0079	0.0058	0.1	0.1
124	1240	0.0040	0.0080	1.8400	0.7299	0.0058	1.6159	0.0079	0.0058	0.1	0.1
125	1250	0.0040	0.0080	1.8480	0.7357	0.0059	1.6238	0.0079	0.0059	0.1	0.1
126	1260	0.0040	0.0080	1.8560	0.7416	0.0059	1.6317	0.0079	0.0059	0.1	0.1
127	1270	0.0040	0.0080	1.8640	0.7475	0.0059	1.6396	0.0079	0.0059	0.1	0.1
128	1280	0.0040	0.0080	1.8720	0.7534	0.0059	1.6476	0.0079	0.0059	0.1	0.1
129	1290	0.0040	0.0080	1.8800	0.7593	0.0059	1.6555	0.0079	0.0059	0.1	0.1
130	1300	0.0040	0.0080	1.8880	0.7652	0.0059	1.6634	0.0079	0.0059	0.1	0.1
131	1310	0.0040	0.0080	1.8960	0.7711	0.0059	1.6713	0.0079	0.0059	0.1	0.1
132	1320	0.0040	0.0080	1.9040	0.7770	0.0059	1.6792	0.0079	0.0059	0.1	0.1
133	1330	0.0040	0.0080	1.9120	0.7830	0.0059	1.6872	0.0079	0.0059	0.1	0.1
134	1340	0.0040	0.0080	1.9200	0.7889	0.0060	1.6951	0.0079	0.0060	0.1	0.1
135	1350	0.0040	0.0080	1.9280	0.7949	0.0060	1.7030	0.0079	0.0060	0.1	0.1
136	1360	0.0040	0.0080	1.9360	0.8009	0.0060	1.7109	0.0079	0.0060	0.1	0.1
137	1370	0.0040	0.0080	1.9440	0.8068	0.0060	1.7189	0.0079	0.0060	0.1	0.1
138	1380	0.0040	0.0080	1.9520	0.8128	0.0060	1.7268	0.0079	0.0060	0.1	0.1
139	1390	0.0040	0.0080	1.9600	0.8188	0.0060	1.7347	0.0079	0.0060	0.1	0.1
140	1400	0.0040	0.0080	1.9680	0.8249	0.0060	1.7426	0.0079	0.0060	0.1	0.1
141	1410	0.0040	0.0080	1.9760	0.8309	0.0060	1.7506	0.0079	0.0060	0.1	0.1

(1) Time Increment	(2) Time (Min)	(3) Rainfall Distri- bution (% of Pt)	(4) Incre- mental Rainfall (in)	(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)	(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)	
142	1420	0.0040	0.0080	1.9840	0.8369	0.0060	1.7585	0.0079	0.0060	0.1	0.1	
143	1430	0.0040	0.0080	1.9920	0.8429	0.0060	1.7664	0.0079	0.0060	0.1	0.1	
144	1440	0.0040	0.0080	2.0000	0.8490	0.0061	1.7744	0.0079	0.0061	0.1	0.1	
Total		1.0000	2.0000								Hydrograph Volume (Cubic Feet)	10919

Given:

Area = 10.93 acres
 Pt = 1 inches
 dt = 10 min.
 Tc = 15 min.
 w = 0.2500 routing constant

Pervious Area

Area = 3.75 acres
 CN = 86
 S = 1.63
 0.2S = 0.33

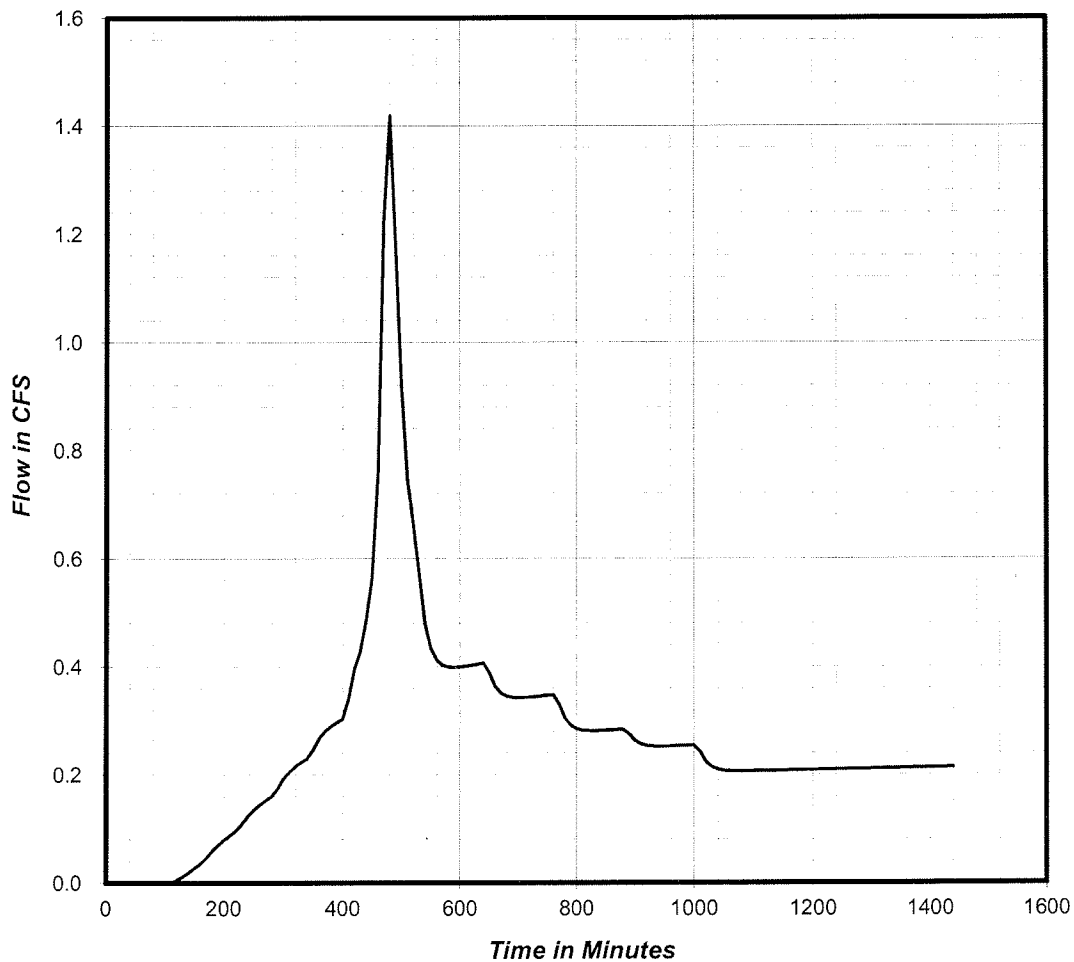
Impervious Area

Area = 7.18 acres
 CN = 98
 S = 0.20
 0.2S = 0.04

HYDROGRAPH RESULTS

Peak Runoff 1.4 cfs
 Total Vol. : 23111 cf

Peak Runoff Hydrograph



(1) Time Increment	(2) Time (Min)	(3) Rainfall Distri- bution (% of Pt)	(4) Incre- mental Rainfall (in)	Pervious Area			Impervious Area			(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)
				(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)				
1	10	0.0040	0.0040	0.0040	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0	
2	20	0.0040	0.0040	0.0080	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0	
3	30	0.0040	0.0040	0.0120	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0	
4	40	0.0040	0.0040	0.0160	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0	
5	50	0.0040	0.0040	0.0200	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0	
6	60	0.0040	0.0040	0.0240	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0	
7	70	0.0040	0.0040	0.0280	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0	
8	80	0.0040	0.0040	0.0320	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0	
9	90	0.0040	0.0040	0.0360	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0	
10	100	0.0040	0.0040	0.0400	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0	
11	110	0.0050	0.0050	0.0450	0.0000	0.0000	0.0001	0.0001	0.0001	0.0	0.0	
12	120	0.0050	0.0050	0.0500	0.0000	0.0000	0.0004	0.0003	0.0002	0.0	0.0	
13	130	0.0050	0.0050	0.0550	0.0000	0.0000	0.0009	0.0005	0.0003	0.0	0.0	
14	140	0.0050	0.0050	0.0600	0.0000	0.0000	0.0016	0.0007	0.0005	0.0	0.0	
15	150	0.0050	0.0050	0.0650	0.0000	0.0000	0.0026	0.0009	0.0006	0.0	0.0	
16	160	0.0050	0.0050	0.0700	0.0000	0.0000	0.0037	0.0011	0.0007	0.0	0.0	
17	170	0.0060	0.0060	0.0760	0.0000	0.0000	0.0052	0.0015	0.0010	0.1	0.0	
18	180	0.0060	0.0060	0.0820	0.0000	0.0000	0.0069	0.0017	0.0011	0.1	0.1	
19	190	0.0060	0.0060	0.0880	0.0000	0.0000	0.0089	0.0019	0.0013	0.1	0.1	
20	200	0.0060	0.0060	0.0940	0.0000	0.0000	0.0110	0.0021	0.0014	0.1	0.1	
21	210	0.0060	0.0060	0.1000	0.0000	0.0000	0.0133	0.0023	0.0015	0.1	0.1	
22	220	0.0060	0.0060	0.1060	0.0000	0.0000	0.0158	0.0025	0.0016	0.1	0.1	
23	230	0.0070	0.0070	0.1130	0.0000	0.0000	0.0189	0.0031	0.0020	0.1	0.1	
24	240	0.0070	0.0070	0.1200	0.0000	0.0000	0.0221	0.0033	0.0022	0.1	0.1	
25	250	0.0070	0.0070	0.1270	0.0000	0.0000	0.0256	0.0035	0.0023	0.2	0.1	
26	260	0.0070	0.0070	0.1340	0.0000	0.0000	0.0292	0.0036	0.0024	0.2	0.1	
27	270	0.0070	0.0070	0.1410	0.0000	0.0000	0.0330	0.0038	0.0025	0.2	0.2	
28	280	0.0070	0.0070	0.1480	0.0000	0.0000	0.0369	0.0039	0.0026	0.2	0.2	
29	290	0.0082	0.0082	0.1562	0.0000	0.0000	0.0417	0.0048	0.0031	0.2	0.2	
30	300	0.0082	0.0082	0.1644	0.0000	0.0000	0.0466	0.0049	0.0032	0.2	0.2	
31	310	0.0082	0.0082	0.1726	0.0000	0.0000	0.0517	0.0051	0.0033	0.2	0.2	
32	320	0.0082	0.0082	0.1808	0.0000	0.0000	0.0570	0.0052	0.0034	0.2	0.2	
33	330	0.0082	0.0082	0.1890	0.0000	0.0000	0.0623	0.0054	0.0035	0.2	0.2	
34	340	0.0082	0.0082	0.1972	0.0000	0.0000	0.0678	0.0055	0.0036	0.2	0.2	
35	350	0.0095	0.0095	0.2067	0.0000	0.0000	0.0744	0.0065	0.0043	0.3	0.2	
36	360	0.0095	0.0095	0.2162	0.0000	0.0000	0.0811	0.0067	0.0044	0.3	0.3	
37	370	0.0095	0.0095	0.2257	0.0000	0.0000	0.0879	0.0068	0.0045	0.3	0.3	
38	380	0.0095	0.0095	0.2352	0.0000	0.0000	0.0948	0.0069	0.0046	0.3	0.3	
39	390	0.0095	0.0095	0.2447	0.0000	0.0000	0.1019	0.0071	0.0046	0.3	0.3	
40	400	0.0095	0.0095	0.2542	0.0000	0.0000	0.1091	0.0072	0.0047	0.3	0.3	
41	410	0.0134	0.0134	0.2676	0.0000	0.0000	0.1194	0.0103	0.0068	0.4	0.3	
42	420	0.0134	0.0134	0.2810	0.0000	0.0000	0.1299	0.0105	0.0069	0.5	0.4	
43	430	0.0134	0.0134	0.2944	0.0000	0.0000	0.1405	0.0107	0.0070	0.5	0.4	
44	440	0.0180	0.0180	0.3124	0.0000	0.0000	0.1551	0.0146	0.0096	0.6	0.5	
45	450	0.0180	0.0180	0.3304	0.0000	0.0000	0.1699	0.0148	0.0097	0.6	0.6	
46	460	0.0340	0.0340	0.3644	0.0009	0.0009	0.1984	0.0286	0.0191	1.3	0.8	
47	470	0.0540	0.0540	0.4184	0.0050	0.0041	0.2451	0.0467	0.0321	2.1	1.2	
48	480	0.0270	0.0270	0.4454	0.0082	0.0032	0.2689	0.0238	0.0168	1.1	1.4	
49	490	0.0180	0.0180	0.4634	0.0108	0.0025	0.2850	0.0160	0.0114	0.8	1.2	
50	500	0.0134	0.0134	0.4768	0.0129	0.0021	0.2970	0.0120	0.0086	0.6	0.9	
51	510	0.0134	0.0134	0.4902	0.0151	0.0023	0.3090	0.0121	0.0087	0.6	0.7	
52	520	0.0134	0.0134	0.5036	0.0175	0.0024	0.3212	0.0121	0.0088	0.6	0.7	
53	530	0.0088	0.0088	0.5124	0.0192	0.0017	0.3291	0.0080	0.0058	0.4	0.6	
54	540	0.0088	0.0088	0.5212	0.0210	0.0018	0.3372	0.0080	0.0059	0.4	0.5	
55	550	0.0088	0.0088	0.5300	0.0228	0.0018	0.3452	0.0080	0.0059	0.4	0.4	
56	560	0.0088	0.0088	0.5388	0.0247	0.0019	0.3532	0.0080	0.0059	0.4	0.4	
57	570	0.0088	0.0088	0.5476	0.0266	0.0020	0.3613	0.0081	0.0060	0.4	0.4	
58	580	0.0088	0.0088	0.5564	0.0287	0.0020	0.3694	0.0081	0.0060	0.4	0.4	
59	590	0.0088	0.0088	0.5652	0.0307	0.0021	0.3775	0.0081	0.0060	0.4	0.4	
60	600	0.0088	0.0088	0.5740	0.0329	0.0021	0.3856	0.0081	0.0061	0.4	0.4	
61	610	0.0088	0.0088	0.5828	0.0351	0.0022	0.3937	0.0081	0.0061	0.4	0.4	
62	620	0.0088	0.0088	0.5916	0.0374	0.0023	0.4019	0.0081	0.0061	0.4	0.4	
63	630	0.0088	0.0088	0.6004	0.0397	0.0023	0.4100	0.0082	0.0062	0.4	0.4	
64	640	0.0088	0.0088	0.6092	0.0421	0.0024	0.4182	0.0082	0.0062	0.4	0.4	
65	650	0.0072	0.0072	0.6164	0.0441	0.0020	0.4249	0.0067	0.0051	0.3	0.4	
66	660	0.0072	0.0072	0.6236	0.0461	0.0020	0.4316	0.0067	0.0051	0.3	0.4	
67	670	0.0072	0.0072	0.6308	0.0482	0.0021	0.4384	0.0067	0.0051	0.3	0.4	
68	680	0.0072	0.0072	0.6380	0.0503	0.0021	0.4451	0.0067	0.0051	0.3	0.3	

(1) Time Incre- ment	(2) Time (Min)	(3) Rainfall Distri- bution (% of Pt)	(4) Incre- mental Rainfall (in)	(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)	(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)
69	690	0.0072	0.0072	0.6452	0.0525	0.0022	0.4518	0.0067	0.0052	0.3	0.3
70	700	0.0072	0.0072	0.6524	0.0546	0.0022	0.4586	0.0067	0.0052	0.3	0.3
71	710	0.0072	0.0072	0.6596	0.0569	0.0022	0.4653	0.0068	0.0052	0.3	0.3

(1) Time Increment	(2) Time (Min)	(3) Rainfall Distri- bution (% of Pt)	(4) Incre- mental Rainfall (in)	(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)	(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)
72	720	0.0072	0.0072	0.6668	0.0591	0.0023	0.4721	0.0068	0.0052	0.3	0.3
73	730	0.0072	0.0072	0.6740	0.0614	0.0023	0.4788	0.0068	0.0052	0.3	0.3
74	740	0.0072	0.0072	0.6812	0.0638	0.0023	0.4856	0.0068	0.0053	0.3	0.3
75	750	0.0072	0.0072	0.6884	0.0661	0.0024	0.4924	0.0068	0.0053	0.3	0.3
76	760	0.0072	0.0072	0.6956	0.0685	0.0024	0.4992	0.0068	0.0053	0.3	0.3
77	770	0.0057	0.0057	0.7013	0.0705	0.0019	0.5046	0.0054	0.0042	0.3	0.3
78	780	0.0057	0.0057	0.7070	0.0724	0.0019	0.5100	0.0054	0.0042	0.3	0.3
79	790	0.0057	0.0057	0.7127	0.0744	0.0020	0.5153	0.0054	0.0042	0.3	0.3
80	800	0.0057	0.0057	0.7184	0.0764	0.0020	0.5207	0.0054	0.0042	0.3	0.3
81	810	0.0057	0.0057	0.7241	0.0784	0.0020	0.5261	0.0054	0.0042	0.3	0.3
82	820	0.0057	0.0057	0.7298	0.0804	0.0020	0.5315	0.0054	0.0042	0.3	0.3
83	830	0.0057	0.0057	0.7355	0.0825	0.0021	0.5369	0.0054	0.0043	0.3	0.3
84	840	0.0057	0.0057	0.7412	0.0845	0.0021	0.5424	0.0054	0.0043	0.3	0.3
85	850	0.0057	0.0057	0.7469	0.0866	0.0021	0.5478	0.0054	0.0043	0.3	0.3
86	860	0.0057	0.0057	0.7526	0.0887	0.0021	0.5532	0.0054	0.0043	0.3	0.3
87	870	0.0057	0.0057	0.7583	0.0909	0.0021	0.5586	0.0054	0.0043	0.3	0.3
88	880	0.0057	0.0057	0.7640	0.0930	0.0022	0.5640	0.0054	0.0043	0.3	0.3
89	890	0.0050	0.0050	0.7690	0.0949	0.0019	0.5688	0.0048	0.0038	0.2	0.3
90	900	0.0050	0.0050	0.7740	0.0968	0.0019	0.5735	0.0048	0.0038	0.3	0.3
91	910	0.0050	0.0050	0.7790	0.0988	0.0019	0.5783	0.0048	0.0038	0.3	0.3
92	920	0.0050	0.0050	0.7840	0.1007	0.0019	0.5831	0.0048	0.0038	0.3	0.3
93	930	0.0050	0.0050	0.7890	0.1027	0.0020	0.5878	0.0048	0.0038	0.3	0.3
94	940	0.0050	0.0050	0.7940	0.1047	0.0020	0.5926	0.0048	0.0038	0.3	0.3
95	950	0.0050	0.0050	0.7990	0.1067	0.0020	0.5974	0.0048	0.0038	0.3	0.3
96	960	0.0050	0.0050	0.8040	0.1087	0.0020	0.6022	0.0048	0.0038	0.3	0.3
97	970	0.0050	0.0050	0.8090	0.1107	0.0020	0.6069	0.0048	0.0038	0.3	0.3
98	980	0.0050	0.0050	0.8140	0.1127	0.0020	0.6117	0.0048	0.0038	0.3	0.3
99	990	0.0050	0.0050	0.8190	0.1148	0.0020	0.6165	0.0048	0.0038	0.3	0.3
100	1000	0.0050	0.0050	0.8240	0.1168	0.0021	0.6213	0.0048	0.0039	0.3	0.3
101	1010	0.0040	0.0040	0.8280	0.1185	0.0017	0.6251	0.0038	0.0031	0.2	0.2
102	1020	0.0040	0.0040	0.8320	0.1202	0.0017	0.6289	0.0038	0.0031	0.2	0.2
103	1030	0.0040	0.0040	0.8360	0.1218	0.0017	0.6328	0.0038	0.0031	0.2	0.2
104	1040	0.0040	0.0040	0.8400	0.1235	0.0017	0.6366	0.0038	0.0031	0.2	0.2
105	1050	0.0040	0.0040	0.8440	0.1252	0.0017	0.6405	0.0038	0.0031	0.2	0.2
106	1060	0.0040	0.0040	0.8480	0.1269	0.0017	0.6443	0.0038	0.0031	0.2	0.2
107	1070	0.0040	0.0040	0.8520	0.1286	0.0017	0.6481	0.0038	0.0031	0.2	0.2
108	1080	0.0040	0.0040	0.8560	0.1304	0.0017	0.6520	0.0038	0.0031	0.2	0.2
109	1090	0.0040	0.0040	0.8600	0.1321	0.0017	0.6558	0.0038	0.0031	0.2	0.2
110	1100	0.0040	0.0040	0.8640	0.1338	0.0017	0.6596	0.0038	0.0031	0.2	0.2
111	1110	0.0040	0.0040	0.8680	0.1356	0.0017	0.6635	0.0038	0.0031	0.2	0.2
112	1120	0.0040	0.0040	0.8720	0.1373	0.0018	0.6673	0.0038	0.0031	0.2	0.2
113	1130	0.0040	0.0040	0.8760	0.1391	0.0018	0.6712	0.0038	0.0031	0.2	0.2
114	1140	0.0040	0.0040	0.8800	0.1408	0.0018	0.6750	0.0038	0.0031	0.2	0.2
115	1150	0.0040	0.0040	0.8840	0.1426	0.0018	0.6789	0.0038	0.0031	0.2	0.2
116	1160	0.0040	0.0040	0.8880	0.1444	0.0018	0.6827	0.0038	0.0031	0.2	0.2
117	1170	0.0040	0.0040	0.8920	0.1462	0.0018	0.6866	0.0038	0.0031	0.2	0.2
118	1180	0.0040	0.0040	0.8960	0.1480	0.0018	0.6904	0.0039	0.0031	0.2	0.2
119	1190	0.0040	0.0040	0.9000	0.1498	0.0018	0.6943	0.0039	0.0032	0.2	0.2
120	1200	0.0040	0.0040	0.9040	0.1516	0.0018	0.6981	0.0039	0.0032	0.2	0.2
121	1210	0.0040	0.0040	0.9080	0.1535	0.0018	0.7020	0.0039	0.0032	0.2	0.2
122	1220	0.0040	0.0040	0.9120	0.1553	0.0018	0.7058	0.0039	0.0032	0.2	0.2
123	1230	0.0040	0.0040	0.9160	0.1571	0.0018	0.7097	0.0039	0.0032	0.2	0.2
124	1240	0.0040	0.0040	0.9200	0.1590	0.0018	0.7135	0.0039	0.0032	0.2	0.2
125	1250	0.0040	0.0040	0.9240	0.1609	0.0019	0.7174	0.0039	0.0032	0.2	0.2
126	1260	0.0040	0.0040	0.9280	0.1627	0.0019	0.7213	0.0039	0.0032	0.2	0.2
127	1270	0.0040	0.0040	0.9320	0.1646	0.0019	0.7251	0.0039	0.0032	0.2	0.2
128	1280	0.0040	0.0040	0.9360	0.1665	0.0019	0.7290	0.0039	0.0032	0.2	0.2
129	1290	0.0040	0.0040	0.9400	0.1684	0.0019	0.7329	0.0039	0.0032	0.2	0.2
130	1300	0.0040	0.0040	0.9440	0.1703	0.0019	0.7367	0.0039	0.0032	0.2	0.2
131	1310	0.0040	0.0040	0.9480	0.1722	0.0019	0.7406	0.0039	0.0032	0.2	0.2
132	1320	0.0040	0.0040	0.9520	0.1741	0.0019	0.7444	0.0039	0.0032	0.2	0.2
133	1330	0.0040	0.0040	0.9560	0.1760	0.0019	0.7483	0.0039	0.0032	0.2	0.2
134	1340	0.0040	0.0040	0.9600	0.1779	0.0019	0.7522	0.0039	0.0032	0.2	0.2
135	1350	0.0040	0.0040	0.9640	0.1798	0.0019	0.7560	0.0039	0.0032	0.2	0.2
136	1360	0.0040	0.0040	0.9680	0.1818	0.0019	0.7599	0.0039	0.0032	0.2	0.2
137	1370	0.0040	0.0040	0.9720	0.1837	0.0019	0.7638	0.0039	0.0032	0.2	0.2
138	1380	0.0040	0.0040	0.9760	0.1857	0.0020	0.7677	0.0039	0.0032	0.2	0.2
139	1390	0.0040	0.0040	0.9800	0.1876	0.0020	0.7715	0.0039	0.0032	0.2	0.2
140	1400	0.0040	0.0040	0.9840	0.1896	0.0020	0.7754	0.0039	0.0032	0.2	0.2
141	1410	0.0040	0.0040	0.9880	0.1916	0.0020	0.7793	0.0039	0.0032	0.2	0.2

(1) Time Incre- ment	(2) Time (Min)	(3) Rainfall Distri- bution (% of Pt)	(4) Incre- mental Rainfall (in)	(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)	(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)
142	1420	0.0040	0.0040	0.9920	0.1936	0.0020	0.7832	0.0039	0.0032	0.2	0.2
143	1430	0.0040	0.0040	0.9960	0.1956	0.0020	0.7870	0.0039	0.0032	0.2	0.2
144	1440	0.0040	0.0040	1.0000	0.1976	0.0020	0.7909	0.0039	0.0032	0.2	0.2
Total		1.0000	1.0000							Hydrograph Volume 23111 (Cubic Feet)	

Given:

Area = 10.93 acres
 Pt = 3 inches
 dt = 10 min.
 Tc = 38 min.
 w = 0.1163 routing constant

Pervious Area

Area = 10.93 acres
 CN = 86
 S = 1.63
 0.2S = 0.33

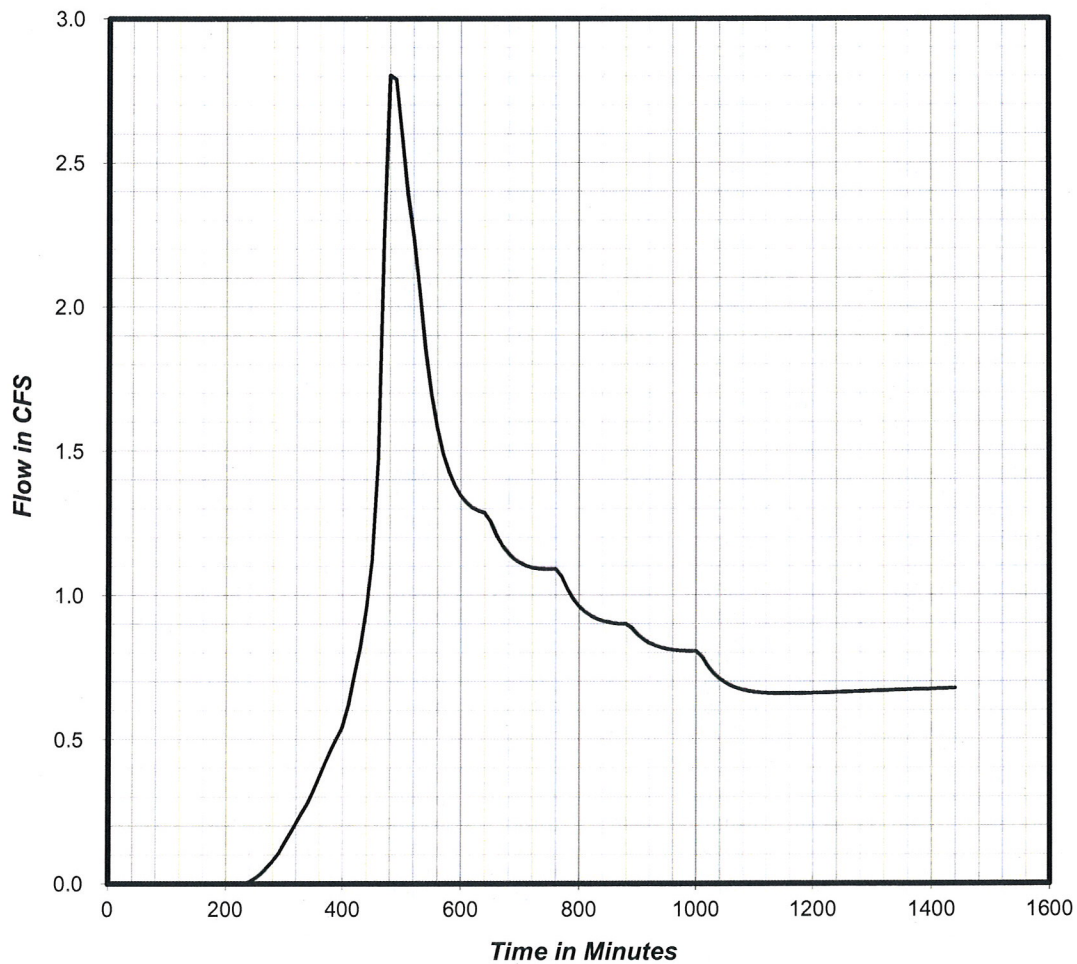
Impervious Area

Area = 0 acres
 CN = 98
 S = 0.20
 0.2S = 0.04

HYDROGRAPH RESULTS

Peak Runoff: 2.8 cfs
 Total Vol.: 64416 cf

Peak Runoff Hydrograph



(1) Time Increment	(2) Time (Min)	(3) Rainfall Distri- bution (% of Pt)	(4) Incre- mental Rainfall (in)	Pervious Area			Impervious Area			(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)
				(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)				
1	10	0.0040	0.0120	0.0120	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0
2	20	0.0040	0.0120	0.0240	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0
3	30	0.0040	0.0120	0.0360	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0
4	40	0.0040	0.0120	0.0480	0.0000	0.0000	0.0002	0.0002	0.0002	0.0000	0.0	0.0
5	50	0.0040	0.0120	0.0600	0.0000	0.0000	0.0016	0.0014	0.0000	0.0000	0.0	0.0
6	60	0.0040	0.0120	0.0720	0.0000	0.0000	0.0041	0.0025	0.0000	0.0000	0.0	0.0
7	70	0.0040	0.0120	0.0840	0.0000	0.0000	0.0075	0.0034	0.0000	0.0000	0.0	0.0
8	80	0.0040	0.0120	0.0960	0.0000	0.0000	0.0117	0.0042	0.0000	0.0000	0.0	0.0
9	90	0.0040	0.0120	0.1080	0.0000	0.0000	0.0166	0.0049	0.0000	0.0000	0.0	0.0
10	100	0.0040	0.0120	0.1200	0.0000	0.0000	0.0221	0.0055	0.0000	0.0000	0.0	0.0
11	110	0.0050	0.0150	0.1350	0.0000	0.0000	0.0297	0.0076	0.0000	0.0000	0.0	0.0
12	120	0.0050	0.0150	0.1500	0.0000	0.0000	0.0381	0.0083	0.0000	0.0000	0.0	0.0
13	130	0.0050	0.0150	0.1650	0.0000	0.0000	0.0470	0.0089	0.0000	0.0000	0.0	0.0
14	140	0.0050	0.0150	0.1800	0.0000	0.0000	0.0564	0.0095	0.0000	0.0000	0.0	0.0
15	150	0.0050	0.0150	0.1950	0.0000	0.0000	0.0664	0.0099	0.0000	0.0000	0.0	0.0
16	160	0.0050	0.0150	0.2100	0.0000	0.0000	0.0767	0.0103	0.0000	0.0000	0.0	0.0
17	170	0.0060	0.0180	0.2280	0.0000	0.0000	0.0895	0.0129	0.0000	0.0000	0.0	0.0
18	180	0.0060	0.0180	0.2460	0.0000	0.0000	0.1029	0.0133	0.0000	0.0000	0.0	0.0
19	190	0.0060	0.0180	0.2640	0.0000	0.0000	0.1166	0.0137	0.0000	0.0000	0.0	0.0
20	200	0.0060	0.0180	0.2820	0.0000	0.0000	0.1306	0.0141	0.0000	0.0000	0.0	0.0
21	210	0.0060	0.0180	0.3000	0.0000	0.0000	0.1450	0.0144	0.0000	0.0000	0.0	0.0
22	220	0.0060	0.0180	0.3180	0.0000	0.0000	0.1596	0.0146	0.0000	0.0000	0.0	0.0
23	230	0.0070	0.0210	0.3390	0.0001	0.0001	0.1770	0.0174	0.0001	0.0001	0.0	0.0
24	240	0.0070	0.0210	0.3600	0.0007	0.0006	0.1947	0.0177	0.0006	0.0006	0.0	0.0
25	250	0.0070	0.0210	0.3810	0.0018	0.0011	0.2126	0.0179	0.0011	0.0011	0.1	0.0
26	260	0.0070	0.0210	0.4020	0.0034	0.0016	0.2308	0.0182	0.0016	0.0016	0.1	0.0
27	270	0.0070	0.0210	0.4230	0.0055	0.0021	0.2491	0.0184	0.0021	0.0021	0.1	0.1
28	280	0.0070	0.0210	0.4440	0.0080	0.0025	0.2677	0.0185	0.0025	0.0025	0.2	0.1
29	290	0.0082	0.0246	0.4686	0.0116	0.0035	0.2896	0.0219	0.0035	0.0035	0.2	0.1
30	300	0.0082	0.0246	0.4932	0.0156	0.0041	0.3117	0.0221	0.0041	0.0041	0.3	0.1
31	310	0.0082	0.0246	0.5178	0.0203	0.0047	0.3341	0.0223	0.0047	0.0047	0.3	0.2
32	320	0.0082	0.0246	0.5424	0.0255	0.0052	0.3565	0.0225	0.0052	0.0052	0.3	0.2
33	330	0.0082	0.0246	0.5670	0.0312	0.0057	0.3791	0.0226	0.0057	0.0057	0.4	0.2
34	340	0.0082	0.0246	0.5916	0.0374	0.0062	0.4019	0.0227	0.0062	0.0062	0.4	0.3
35	350	0.0095	0.0285	0.6201	0.0451	0.0078	0.4284	0.0265	0.0078	0.0078	0.5	0.3
36	360	0.0095	0.0285	0.6486	0.0535	0.0084	0.4550	0.0266	0.0084	0.0084	0.6	0.4
37	370	0.0095	0.0285	0.6771	0.0624	0.0089	0.4818	0.0268	0.0089	0.0089	0.6	0.4
38	380	0.0095	0.0285	0.7056	0.0719	0.0095	0.5086	0.0269	0.0095	0.0095	0.6	0.5
39	390	0.0095	0.0285	0.7341	0.0820	0.0100	0.5356	0.0270	0.0100	0.0100	0.7	0.5
40	400	0.0095	0.0285	0.7626	0.0925	0.0105	0.5627	0.0271	0.0105	0.0105	0.7	0.5
41	410	0.0134	0.0402	0.8028	0.1082	0.0157	0.6010	0.0383	0.0157	0.0157	1.0	0.6
42	420	0.0134	0.0402	0.8430	0.1248	0.0166	0.6395	0.0385	0.0166	0.0166	1.1	0.7
43	430	0.0134	0.0402	0.8832	0.1423	0.0175	0.6781	0.0386	0.0175	0.0175	1.2	0.8
44	440	0.0180	0.0540	0.9372	0.1670	0.0248	0.7301	0.0520	0.0248	0.0248	1.6	1.0
45	450	0.0180	0.0540	0.9912	0.1932	0.0261	0.7824	0.0522	0.0261	0.0261	1.7	1.1
46	460	0.0340	0.1020	1.0932	0.2460	0.0528	0.8815	0.0991	0.0528	0.0528	3.5	1.5
47	470	0.0540	0.1620	1.2552	0.3379	0.0919	1.0397	0.1582	0.0919	0.0919	6.1	2.2
48	480	0.0270	0.0810	1.3362	0.3871	0.0492	1.1191	0.0794	0.0492	0.0492	3.3	2.8
49	490	0.0180	0.0540	1.3902	0.4209	0.0339	1.1721	0.0530	0.0339	0.0339	2.2	2.8
50	500	0.0134	0.0402	1.4304	0.4467	0.0257	1.2116	0.0395	0.0257	0.0257	1.7	2.6
51	510	0.0134	0.0402	1.4706	0.4728	0.0261	1.2512	0.0396	0.0261	0.0261	1.7	2.4
52	520	0.0134	0.0402	1.5108	0.4994	0.0265	1.2908	0.0396	0.0265	0.0265	1.8	2.2
53	530	0.0088	0.0264	1.5372	0.5170	0.0176	1.3168	0.0260	0.0176	0.0176	1.2	2.1
54	540	0.0088	0.0264	1.5636	0.5348	0.0178	1.3428	0.0260	0.0178	0.0178	1.2	1.9
55	550	0.0088	0.0264	1.5900	0.5528	0.0180	1.3689	0.0260	0.0180	0.0180	1.2	1.7
56	560	0.0088	0.0264	1.6164	0.5709	0.0181	1.3949	0.0260	0.0181	0.0181	1.2	1.6
57	570	0.0088	0.0264	1.6428	0.5891	0.0183	1.4210	0.0261	0.0183	0.0183	1.2	1.5
58	580	0.0088	0.0264	1.6692	0.6075	0.0184	1.4470	0.0261	0.0184	0.0184	1.2	1.4
59	590	0.0088	0.0264	1.6956	0.6261	0.0185	1.4731	0.0261	0.0185	0.0185	1.2	1.4
60	600	0.0088	0.0264	1.7220	0.6448	0.0187	1.4992	0.0261	0.0187	0.0187	1.2	1.3
61	610	0.0088	0.0264	1.7484	0.6636	0.0188	1.5253	0.0261	0.0188	0.0188	1.2	1.3
62	620	0.0088	0.0264	1.7748	0.6825	0.0189	1.5514	0.0261	0.0189	0.0189	1.3	1.3
63	630	0.0088	0.0264	1.8012	0.7016	0.0191	1.5775	0.0261	0.0191	0.0191	1.3	1.3
64	640	0.0088	0.0264	1.8276	0.7208	0.0192	1.6036	0.0261	0.0192	0.0192	1.3	1.3
65	650	0.0072	0.0216	1.8492	0.7366	0.0158	1.6250	0.0214	0.0158	0.0158	1.0	1.3
66	660	0.0072	0.0216	1.8708	0.7525	0.0159	1.6464	0.0214	0.0159	0.0159	1.0	1.2
67	670	0.0072	0.0216	1.8924	0.7684	0.0160	1.6678	0.0214	0.0160	0.0160	1.1	1.2
68	680	0.0072	0.0216	1.9140	0.7845	0.0160	1.6892	0.0214	0.0160	0.0160	1.1	1.1

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Time	Time	Rainfall	Incr-	Accumu-	Accumu-	Incr-	Accumu-	Incr-	Total	Instant	Design
Increment		Distri-	mental	lated	lated	mental	lated	mental	Runoff	Hydro-	Hydro-
	(Min)	bution	Rainfall	Rainfall	Runoff	Runoff	Runoff	Runoff	(in)	graph	graph
		(% of Pt)	(in)	(in)	(in)	(in)	(in)	(in)	(in)	(cfs)	(cfs)
69	690	0.0072	0.0216	1.9356	0.8006	0.0161	1.7105	0.0214	0.0161	1.1	1.1
70	700	0.0072	0.0216	1.9572	0.8167	0.0162	1.7319	0.0214	0.0162	1.1	1.1
71	710	0.0072	0.0216	1.9788	0.8330	0.0162	1.7533	0.0214	0.0162	1.1	1.1

(1) Time Increment	(2) Time (Min)	(3) Rainfall Distri- bution (% of Pt)	(4) Incre- mental Rainfall (in)	(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)	(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)
72	720	0.0072	0.0216	2.0004	0.8493	0.0163	1.7748	0.0214	0.0163	1.1	1.1
73	730	0.0072	0.0216	2.0220	0.8657	0.0164	1.7962	0.0214	0.0164	1.1	1.1
74	740	0.0072	0.0216	2.0436	0.8821	0.0165	1.8176	0.0214	0.0165	1.1	1.1
75	750	0.0072	0.0216	2.0652	0.8987	0.0165	1.8390	0.0214	0.0165	1.1	1.1
76	760	0.0072	0.0216	2.0868	0.9152	0.0166	1.8604	0.0214	0.0166	1.1	1.1
77	770	0.0057	0.0171	2.1039	0.9284	0.0132	1.8774	0.0170	0.0132	0.9	1.1
78	780	0.0057	0.0171	2.1210	0.9416	0.0132	1.8943	0.0170	0.0132	0.9	1.0
79	790	0.0057	0.0171	2.1381	0.9549	0.0133	1.9113	0.0170	0.0133	0.9	1.0
80	800	0.0057	0.0171	2.1552	0.9682	0.0133	1.9283	0.0170	0.0133	0.9	1.0
81	810	0.0057	0.0171	2.1723	0.9815	0.0133	1.9452	0.0170	0.0133	0.9	0.9
82	820	0.0057	0.0171	2.1894	0.9949	0.0134	1.9622	0.0170	0.0134	0.9	0.9
83	830	0.0057	0.0171	2.2065	1.0083	0.0134	1.9792	0.0170	0.0134	0.9	0.9
84	840	0.0057	0.0171	2.2236	1.0217	0.0134	1.9962	0.0170	0.0134	0.9	0.9
85	850	0.0057	0.0171	2.2407	1.0352	0.0135	2.0131	0.0170	0.0135	0.9	0.9
86	860	0.0057	0.0171	2.2578	1.0487	0.0135	2.0301	0.0170	0.0135	0.9	0.9
87	870	0.0057	0.0171	2.2749	1.0622	0.0135	2.0471	0.0170	0.0135	0.9	0.9
88	880	0.0057	0.0171	2.2920	1.0758	0.0136	2.0641	0.0170	0.0136	0.9	0.9
89	890	0.0050	0.0150	2.3070	1.0877	0.0119	2.0790	0.0149	0.0119	0.8	0.9
90	900	0.0050	0.0150	2.3220	1.0997	0.0120	2.0939	0.0149	0.0120	0.8	0.9
91	910	0.0050	0.0150	2.3370	1.1117	0.0120	2.1088	0.0149	0.0120	0.8	0.8
92	920	0.0050	0.0150	2.3520	1.1237	0.0120	2.1237	0.0149	0.0120	0.8	0.8
93	930	0.0050	0.0150	2.3670	1.1357	0.0120	2.1386	0.0149	0.0120	0.8	0.8
94	940	0.0050	0.0150	2.3820	1.1478	0.0121	2.1535	0.0149	0.0121	0.8	0.8
95	950	0.0050	0.0150	2.3970	1.1599	0.0121	2.1684	0.0149	0.0121	0.8	0.8
96	960	0.0050	0.0150	2.4120	1.1720	0.0121	2.1833	0.0149	0.0121	0.8	0.8
97	970	0.0050	0.0150	2.4270	1.1841	0.0121	2.1982	0.0149	0.0121	0.8	0.8
98	980	0.0050	0.0150	2.4420	1.1963	0.0122	2.2131	0.0149	0.0122	0.8	0.8
99	990	0.0050	0.0150	2.4570	1.2084	0.0122	2.2280	0.0149	0.0122	0.8	0.8
100	1000	0.0050	0.0150	2.4720	1.2206	0.0122	2.2429	0.0149	0.0122	0.8	0.8
101	1010	0.0040	0.0120	2.4840	1.2304	0.0098	2.2548	0.0119	0.0098	0.6	0.8
102	1020	0.0040	0.0120	2.4960	1.2402	0.0098	2.2668	0.0119	0.0098	0.6	0.8
103	1030	0.0040	0.0120	2.5080	1.2500	0.0098	2.2787	0.0119	0.0098	0.6	0.7
104	1040	0.0040	0.0120	2.5200	1.2598	0.0098	2.2906	0.0119	0.0098	0.6	0.7
105	1050	0.0040	0.0120	2.5320	1.2697	0.0098	2.3026	0.0119	0.0098	0.7	0.7
106	1060	0.0040	0.0120	2.5440	1.2795	0.0098	2.3145	0.0119	0.0098	0.7	0.7
107	1070	0.0040	0.0120	2.5560	1.2894	0.0099	2.3264	0.0119	0.0099	0.7	0.7
108	1080	0.0040	0.0120	2.5680	1.2992	0.0099	2.3384	0.0119	0.0099	0.7	0.7
109	1090	0.0040	0.0120	2.5800	1.3091	0.0099	2.3503	0.0119	0.0099	0.7	0.7
110	1100	0.0040	0.0120	2.5920	1.3190	0.0099	2.3622	0.0119	0.0099	0.7	0.7
111	1110	0.0040	0.0120	2.6040	1.3289	0.0099	2.3742	0.0119	0.0099	0.7	0.7
112	1120	0.0040	0.0120	2.6160	1.3388	0.0099	2.3861	0.0119	0.0099	0.7	0.7
113	1130	0.0040	0.0120	2.6280	1.3488	0.0099	2.3980	0.0119	0.0099	0.7	0.7
114	1140	0.0040	0.0120	2.6400	1.3587	0.0099	2.4100	0.0119	0.0099	0.7	0.7
115	1150	0.0040	0.0120	2.6520	1.3687	0.0100	2.4219	0.0119	0.0100	0.7	0.7
116	1160	0.0040	0.0120	2.6640	1.3787	0.0100	2.4338	0.0119	0.0100	0.7	0.7
117	1170	0.0040	0.0120	2.6760	1.3886	0.0100	2.4458	0.0119	0.0100	0.7	0.7
118	1180	0.0040	0.0120	2.6880	1.3986	0.0100	2.4577	0.0119	0.0100	0.7	0.7
119	1190	0.0040	0.0120	2.7000	1.4086	0.0100	2.4696	0.0119	0.0100	0.7	0.7
120	1200	0.0040	0.0120	2.7120	1.4187	0.0100	2.4816	0.0119	0.0100	0.7	0.7
121	1210	0.0040	0.0120	2.7240	1.4287	0.0100	2.4935	0.0119	0.0100	0.7	0.7
122	1220	0.0040	0.0120	2.7360	1.4387	0.0100	2.5055	0.0119	0.0100	0.7	0.7
123	1230	0.0040	0.0120	2.7480	1.4488	0.0101	2.5174	0.0119	0.0101	0.7	0.7
124	1240	0.0040	0.0120	2.7600	1.4589	0.0101	2.5293	0.0119	0.0101	0.7	0.7
125	1250	0.0040	0.0120	2.7720	1.4689	0.0101	2.5413	0.0119	0.0101	0.7	0.7
126	1260	0.0040	0.0120	2.7840	1.4790	0.0101	2.5532	0.0119	0.0101	0.7	0.7
127	1270	0.0040	0.0120	2.7960	1.4891	0.0101	2.5652	0.0119	0.0101	0.7	0.7
128	1280	0.0040	0.0120	2.8080	1.4992	0.0101	2.5771	0.0119	0.0101	0.7	0.7
129	1290	0.0040	0.0120	2.8200	1.5094	0.0101	2.5891	0.0119	0.0101	0.7	0.7
130	1300	0.0040	0.0120	2.8320	1.5195	0.0101	2.6010	0.0119	0.0101	0.7	0.7
131	1310	0.0040	0.0120	2.8440	1.5297	0.0101	2.6130	0.0119	0.0101	0.7	0.7
132	1320	0.0040	0.0120	2.8560	1.5398	0.0102	2.6249	0.0119	0.0102	0.7	0.7
133	1330	0.0040	0.0120	2.8680	1.5500	0.0102	2.6368	0.0119	0.0102	0.7	0.7
134	1340	0.0040	0.0120	2.8800	1.5601	0.0102	2.6488	0.0119	0.0102	0.7	0.7
135	1350	0.0040	0.0120	2.8920	1.5703	0.0102	2.6607	0.0119	0.0102	0.7	0.7
136	1360	0.0040	0.0120	2.9040	1.5805	0.0102	2.6727	0.0119	0.0102	0.7	0.7
137	1370	0.0040	0.0120	2.9160	1.5907	0.0102	2.6846	0.0119	0.0102	0.7	0.7
138	1380	0.0040	0.0120	2.9280	1.6010	0.0102	2.6966	0.0119	0.0102	0.7	0.7
139	1390	0.0040	0.0120	2.9400	1.6112	0.0102	2.7085	0.0119	0.0102	0.7	0.7
140	1400	0.0040	0.0120	2.9520	1.6214	0.0102	2.7205	0.0119	0.0102	0.7	0.7
141	1410	0.0040	0.0120	2.9640	1.6317	0.0102	2.7324	0.0119	0.0102	0.7	0.7

(1) Time Incre- ment	(2) Time (Min)	(3) Rainfall Distri- bution (% of Pt)	(4) Incre- mental Rainfall (in)	(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)	(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)		
142	1420	0.0040	0.0120	2.9760	1.6419	0.0103	2.7444	0.0119	0.0103	0.7	0.7		
143	1430	0.0040	0.0120	2.9880	1.6522	0.0103	2.7563	0.0119	0.0103	0.7	0.7		
144	1440	0.0040	0.0120	3.0000	1.6625	0.0103	2.7683	0.0119	0.0103	0.7	0.7		
Total		1.0000	3.0000								Hydrograph Volume (Cubic Feet)		64416

Given:

Area = 10.93 acres
Pt = 3 inches
dt = 10 min.
Tc = 10 min.
w = 0.3333 routing constant

Pervious Area

Area = 3.75 acres
CN = 86
S = 1.63
0.2S = 0.33

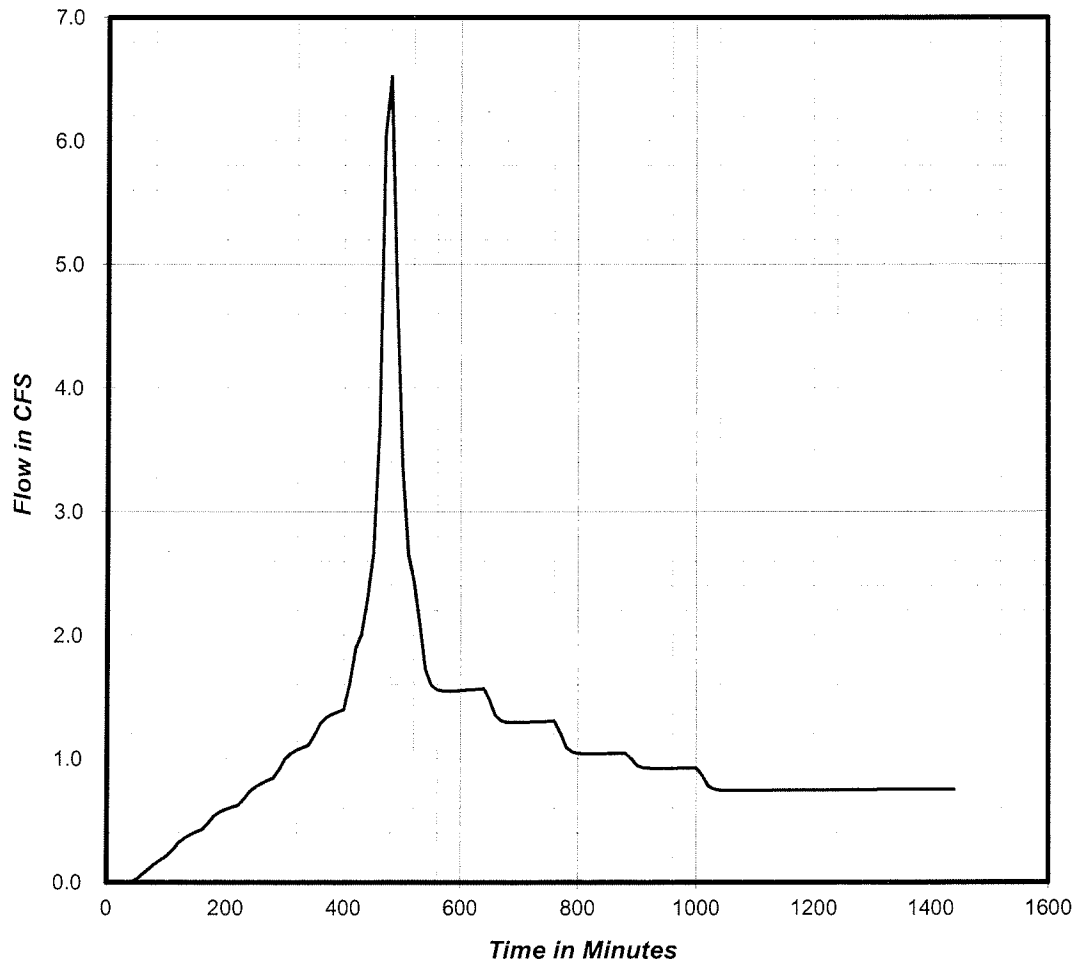
Impervious Area

Area = 7.18 acres
CN = 98
S = 0.20
0.2S = 0.04

HYDROGRAPH RESULTS

Peak Runoff 6.5 cfs
Total Vol. : 94330 cf

Peak Runoff Hydrograph



(1) Time Increment	(2) Time (Min)	(3) Rainfall Distri- bution (% of Pt)	(4) Incre- mental Rainfall (in)	Pervious Area			Impervious Area			(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)
				(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)				
1	10	0.0040	0.0120	0.0120	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0
2	20	0.0040	0.0120	0.0240	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0
3	30	0.0040	0.0120	0.0360	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0
4	40	0.0040	0.0120	0.0480	0.0000	0.0000	0.0002	0.0002	0.0002	0.0002	0.0	0.0
5	50	0.0040	0.0120	0.0600	0.0000	0.0000	0.0016	0.0014	0.0009	0.0009	0.1	0.0
6	60	0.0040	0.0120	0.0720	0.0000	0.0000	0.0041	0.0025	0.0016	0.0016	0.1	0.1
7	70	0.0040	0.0120	0.0840	0.0000	0.0000	0.0075	0.0034	0.0022	0.0022	0.1	0.1
8	80	0.0040	0.0120	0.0960	0.0000	0.0000	0.0117	0.0042	0.0028	0.0028	0.2	0.1
9	90	0.0040	0.0120	0.1080	0.0000	0.0000	0.0166	0.0049	0.0032	0.0032	0.2	0.2
10	100	0.0040	0.0120	0.1200	0.0000	0.0000	0.0221	0.0055	0.0036	0.0036	0.2	0.2
11	110	0.0050	0.0150	0.1350	0.0000	0.0000	0.0297	0.0076	0.0050	0.0050	0.3	0.3
12	120	0.0050	0.0150	0.1500	0.0000	0.0000	0.0381	0.0083	0.0055	0.0055	0.4	0.3
13	130	0.0050	0.0150	0.1650	0.0000	0.0000	0.0470	0.0089	0.0059	0.0059	0.4	0.4
14	140	0.0050	0.0150	0.1800	0.0000	0.0000	0.0564	0.0095	0.0062	0.0062	0.4	0.4
15	150	0.0050	0.0150	0.1950	0.0000	0.0000	0.0664	0.0099	0.0065	0.0065	0.4	0.4
16	160	0.0050	0.0150	0.2100	0.0000	0.0000	0.0767	0.0103	0.0068	0.0068	0.4	0.4
17	170	0.0060	0.0180	0.2280	0.0000	0.0000	0.0895	0.0129	0.0085	0.0085	0.6	0.5
18	180	0.0060	0.0180	0.2460	0.0000	0.0000	0.1029	0.0133	0.0087	0.0087	0.6	0.5
19	190	0.0060	0.0180	0.2640	0.0000	0.0000	0.1166	0.0137	0.0090	0.0090	0.6	0.6
20	200	0.0060	0.0180	0.2820	0.0000	0.0000	0.1306	0.0141	0.0092	0.0092	0.6	0.6
21	210	0.0060	0.0180	0.3000	0.0000	0.0000	0.1450	0.0144	0.0094	0.0094	0.6	0.6
22	220	0.0060	0.0180	0.3180	0.0000	0.0000	0.1596	0.0146	0.0096	0.0096	0.6	0.6
23	230	0.0070	0.0210	0.3390	0.0001	0.0001	0.1770	0.0174	0.0115	0.0115	0.8	0.7
24	240	0.0070	0.0210	0.3600	0.0007	0.0006	0.1947	0.0177	0.0118	0.0118	0.8	0.7
25	250	0.0070	0.0210	0.3810	0.0018	0.0011	0.2126	0.0179	0.0122	0.0122	0.8	0.8
26	260	0.0070	0.0210	0.4020	0.0034	0.0016	0.2308	0.0182	0.0125	0.0125	0.8	0.8
27	270	0.0070	0.0210	0.4230	0.0055	0.0021	0.2491	0.0184	0.0128	0.0128	0.8	0.8
28	280	0.0070	0.0210	0.4440	0.0080	0.0025	0.2677	0.0185	0.0130	0.0130	0.9	0.8
29	290	0.0082	0.0246	0.4686	0.0116	0.0035	0.2896	0.0219	0.0156	0.0156	1.0	0.9
30	300	0.0082	0.0246	0.4932	0.0156	0.0041	0.3117	0.0221	0.0159	0.0159	1.1	1.0
31	310	0.0082	0.0246	0.5178	0.0203	0.0047	0.3341	0.0223	0.0163	0.0163	1.1	1.0
32	320	0.0082	0.0246	0.5424	0.0255	0.0052	0.3565	0.0225	0.0165	0.0165	1.1	1.1
33	330	0.0082	0.0246	0.5670	0.0312	0.0057	0.3791	0.0226	0.0168	0.0168	1.1	1.1
34	340	0.0082	0.0246	0.5916	0.0374	0.0062	0.4019	0.0227	0.0171	0.0171	1.1	1.1
35	350	0.0095	0.0285	0.6201	0.0451	0.0078	0.4284	0.0265	0.0201	0.0201	1.3	1.2
36	360	0.0095	0.0285	0.6486	0.0535	0.0084	0.4550	0.0266	0.0204	0.0204	1.3	1.3
37	370	0.0095	0.0285	0.6771	0.0624	0.0089	0.4818	0.0268	0.0206	0.0206	1.4	1.3
38	380	0.0095	0.0285	0.7056	0.0719	0.0095	0.5086	0.0269	0.0209	0.0209	1.4	1.4
39	390	0.0095	0.0285	0.7341	0.0820	0.0100	0.5356	0.0270	0.0212	0.0212	1.4	1.4
40	400	0.0095	0.0285	0.7626	0.0925	0.0105	0.5627	0.0271	0.0214	0.0214	1.4	1.4
41	410	0.0134	0.0402	0.8028	0.1082	0.0157	0.6010	0.0383	0.0306	0.0306	2.0	1.6
42	420	0.0134	0.0402	0.8430	0.1248	0.0166	0.6395	0.0385	0.0310	0.0310	2.0	1.9
43	430	0.0134	0.0402	0.8832	0.1423	0.0175	0.6781	0.0386	0.0314	0.0314	2.1	2.0
44	440	0.0180	0.0540	0.9372	0.1670	0.0248	0.7301	0.0520	0.0427	0.0427	2.8	2.3
45	450	0.0180	0.0540	0.9912	0.1932	0.0261	0.7824	0.0522	0.0433	0.0433	2.9	2.7
46	460	0.0340	0.1020	1.0932	0.2460	0.0528	0.8815	0.0991	0.0832	0.0832	5.5	3.7
47	470	0.0540	0.1620	1.2552	0.3379	0.0919	1.0397	0.1582	0.1355	0.1355	9.0	6.0
48	480	0.0270	0.0810	1.3362	0.3871	0.0492	1.1191	0.0794	0.0690	0.0690	4.6	6.5
49	490	0.0180	0.0540	1.3902	0.4209	0.0339	1.1721	0.0530	0.0465	0.0465	3.1	4.7
50	500	0.0134	0.0402	1.4304	0.4467	0.0257	1.2116	0.0395	0.0348	0.0348	2.3	3.4
51	510	0.0134	0.0402	1.4706	0.4728	0.0261	1.2512	0.0396	0.0350	0.0350	2.3	2.7
52	520	0.0134	0.0402	1.5108	0.4994	0.0265	1.2908	0.0396	0.0351	0.0351	2.3	2.4
53	530	0.0088	0.0264	1.5372	0.5170	0.0176	1.3168	0.0260	0.0231	0.0231	1.5	2.1
54	540	0.0088	0.0264	1.5636	0.5348	0.0178	1.3428	0.0260	0.0232	0.0232	1.5	1.7
55	550	0.0088	0.0264	1.5900	0.5528	0.0180	1.3689	0.0260	0.0233	0.0233	1.5	1.6
56	560	0.0088	0.0264	1.6164	0.5709	0.0181	1.3949	0.0260	0.0233	0.0233	1.5	1.6
57	570	0.0088	0.0264	1.6428	0.5891	0.0183	1.4210	0.0261	0.0234	0.0234	1.5	1.5
58	580	0.0088	0.0264	1.6692	0.6075	0.0184	1.4470	0.0261	0.0234	0.0234	1.5	1.5
59	590	0.0088	0.0264	1.6956	0.6261	0.0185	1.4731	0.0261	0.0235	0.0235	1.6	1.6
60	600	0.0088	0.0264	1.7220	0.6448	0.0187	1.4992	0.0261	0.0235	0.0235	1.6	1.6
61	610	0.0088	0.0264	1.7484	0.6636	0.0188	1.5253	0.0261	0.0236	0.0236	1.6	1.6
62	620	0.0088	0.0264	1.7748	0.6825	0.0189	1.5514	0.0261	0.0236	0.0236	1.6	1.6
63	630	0.0088	0.0264	1.8012	0.7016	0.0191	1.5775	0.0261	0.0237	0.0237	1.6	1.6
64	640	0.0088	0.0264	1.8276	0.7208	0.0192	1.6036	0.0261	0.0237	0.0237	1.6	1.6
65	650	0.0072	0.0216	1.8492	0.7366	0.0158	1.6250	0.0214	0.0195	0.0195	1.3	1.5
66	660	0.0072	0.0216	1.8708	0.7525	0.0159	1.6464	0.0214	0.0195	0.0195	1.3	1.4
67	670	0.0072	0.0216	1.8924	0.7684	0.0160	1.6678	0.0214	0.0195	0.0195	1.3	1.3
68	680	0.0072	0.0216	1.9140	0.7845	0.0160	1.6892	0.0214	0.0196	0.0196	1.3	1.3

(1) Time Increment	(2) Time (Min)	(3) Rainfall Distri- bution (% of Pt)	(4) Incre- mental Rainfall (in)	(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)	(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)
69	690	0.0072	0.0216	1.9356	0.8006	0.0161	1.7105	0.0214	0.0196	1.3	1.3
70	700	0.0072	0.0216	1.9572	0.8167	0.0162	1.7319	0.0214	0.0196	1.3	1.3
71	710	0.0072	0.0216	1.9788	0.8330	0.0162	1.7533	0.0214	0.0196	1.3	1.3

(1) Time Increment	(2) Time (Min)	(3) Rainfall Distri- bution (% of Pt)	(4) Incre- mental Rainfall (in)	(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)	(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)
72	720	0.0072	0.0216	2.0004	0.8493	0.0163	1.7748	0.0214	0.0197	1.3	1.3
73	730	0.0072	0.0216	2.0220	0.8657	0.0164	1.7962	0.0214	0.0197	1.3	1.3
74	740	0.0072	0.0216	2.0436	0.8821	0.0165	1.8176	0.0214	0.0197	1.3	1.3
75	750	0.0072	0.0216	2.0652	0.8987	0.0165	1.8390	0.0214	0.0197	1.3	1.3
76	760	0.0072	0.0216	2.0868	0.9152	0.0166	1.8604	0.0214	0.0198	1.3	1.3
77	770	0.0057	0.0171	2.1039	0.9284	0.0132	1.8774	0.0170	0.0157	1.0	1.2
78	780	0.0057	0.0171	2.1210	0.9416	0.0132	1.8943	0.0170	0.0157	1.0	1.1
79	790	0.0057	0.0171	2.1381	0.9549	0.0133	1.9113	0.0170	0.0157	1.0	1.1
80	800	0.0057	0.0171	2.1552	0.9682	0.0133	1.9283	0.0170	0.0157	1.0	1.0
81	810	0.0057	0.0171	2.1723	0.9815	0.0133	1.9452	0.0170	0.0157	1.0	1.0
82	820	0.0057	0.0171	2.1894	0.9949	0.0134	1.9622	0.0170	0.0157	1.0	1.0
83	830	0.0057	0.0171	2.2065	1.0083	0.0134	1.9792	0.0170	0.0157	1.0	1.0
84	840	0.0057	0.0171	2.2236	1.0217	0.0134	1.9962	0.0170	0.0158	1.0	1.0
85	850	0.0057	0.0171	2.2407	1.0352	0.0135	2.0131	0.0170	0.0158	1.0	1.0
86	860	0.0057	0.0171	2.2578	1.0487	0.0135	2.0301	0.0170	0.0158	1.0	1.0
87	870	0.0057	0.0171	2.2749	1.0622	0.0135	2.0471	0.0170	0.0158	1.0	1.0
88	880	0.0057	0.0171	2.2920	1.0758	0.0136	2.0641	0.0170	0.0158	1.0	1.0
89	890	0.0050	0.0150	2.3070	1.0877	0.0119	2.0790	0.0149	0.0139	0.9	1.0
90	900	0.0050	0.0150	2.3220	1.0997	0.0120	2.0939	0.0149	0.0139	0.9	0.9
91	910	0.0050	0.0150	2.3370	1.1117	0.0120	2.1088	0.0149	0.0139	0.9	0.9
92	920	0.0050	0.0150	2.3520	1.1237	0.0120	2.1237	0.0149	0.0139	0.9	0.9
93	930	0.0050	0.0150	2.3670	1.1357	0.0120	2.1386	0.0149	0.0139	0.9	0.9
94	940	0.0050	0.0150	2.3820	1.1478	0.0121	2.1535	0.0149	0.0139	0.9	0.9
95	950	0.0050	0.0150	2.3970	1.1599	0.0121	2.1684	0.0149	0.0139	0.9	0.9
96	960	0.0050	0.0150	2.4120	1.1720	0.0121	2.1833	0.0149	0.0139	0.9	0.9
97	970	0.0050	0.0150	2.4270	1.1841	0.0121	2.1982	0.0149	0.0140	0.9	0.9
98	980	0.0050	0.0150	2.4420	1.1963	0.0122	2.2131	0.0149	0.0140	0.9	0.9
99	990	0.0050	0.0150	2.4570	1.2084	0.0122	2.2280	0.0149	0.0140	0.9	0.9
100	1000	0.0050	0.0150	2.4720	1.2206	0.0122	2.2429	0.0149	0.0140	0.9	0.9
101	1010	0.0040	0.0120	2.4840	1.2304	0.0098	2.2548	0.0119	0.0112	0.7	0.9
102	1020	0.0040	0.0120	2.4960	1.2402	0.0098	2.2668	0.0119	0.0112	0.7	0.8
103	1030	0.0040	0.0120	2.5080	1.2500	0.0098	2.2787	0.0119	0.0112	0.7	0.8
104	1040	0.0040	0.0120	2.5200	1.2598	0.0098	2.2906	0.0119	0.0112	0.7	0.7
105	1050	0.0040	0.0120	2.5320	1.2697	0.0098	2.3026	0.0119	0.0112	0.7	0.7
106	1060	0.0040	0.0120	2.5440	1.2795	0.0098	2.3145	0.0119	0.0112	0.7	0.7
107	1070	0.0040	0.0120	2.5560	1.2894	0.0099	2.3264	0.0119	0.0112	0.7	0.7
108	1080	0.0040	0.0120	2.5680	1.2992	0.0099	2.3384	0.0119	0.0112	0.7	0.7
109	1090	0.0040	0.0120	2.5800	1.3091	0.0099	2.3503	0.0119	0.0112	0.7	0.7
110	1100	0.0040	0.0120	2.5920	1.3190	0.0099	2.3622	0.0119	0.0112	0.7	0.7
111	1110	0.0040	0.0120	2.6040	1.3289	0.0099	2.3742	0.0119	0.0112	0.7	0.7
112	1120	0.0040	0.0120	2.6160	1.3388	0.0099	2.3861	0.0119	0.0112	0.7	0.7
113	1130	0.0040	0.0120	2.6280	1.3488	0.0099	2.3980	0.0119	0.0112	0.7	0.7
114	1140	0.0040	0.0120	2.6400	1.3587	0.0099	2.4100	0.0119	0.0113	0.7	0.7
115	1150	0.0040	0.0120	2.6520	1.3687	0.0100	2.4219	0.0119	0.0113	0.7	0.7
116	1160	0.0040	0.0120	2.6640	1.3787	0.0100	2.4338	0.0119	0.0113	0.7	0.7
117	1170	0.0040	0.0120	2.6760	1.3886	0.0100	2.4458	0.0119	0.0113	0.7	0.7
118	1180	0.0040	0.0120	2.6880	1.3986	0.0100	2.4577	0.0119	0.0113	0.7	0.7
119	1190	0.0040	0.0120	2.7000	1.4086	0.0100	2.4696	0.0119	0.0113	0.7	0.7
120	1200	0.0040	0.0120	2.7120	1.4187	0.0100	2.4816	0.0119	0.0113	0.7	0.7
121	1210	0.0040	0.0120	2.7240	1.4287	0.0100	2.4935	0.0119	0.0113	0.7	0.7
122	1220	0.0040	0.0120	2.7360	1.4387	0.0100	2.5055	0.0119	0.0113	0.7	0.7
123	1230	0.0040	0.0120	2.7480	1.4488	0.0101	2.5174	0.0119	0.0113	0.7	0.7
124	1240	0.0040	0.0120	2.7600	1.4589	0.0101	2.5293	0.0119	0.0113	0.7	0.7
125	1250	0.0040	0.0120	2.7720	1.4689	0.0101	2.5413	0.0119	0.0113	0.7	0.7
126	1260	0.0040	0.0120	2.7840	1.4790	0.0101	2.5532	0.0119	0.0113	0.7	0.7
127	1270	0.0040	0.0120	2.7960	1.4891	0.0101	2.5652	0.0119	0.0113	0.7	0.7
128	1280	0.0040	0.0120	2.8080	1.4992	0.0101	2.5771	0.0119	0.0113	0.7	0.7
129	1290	0.0040	0.0120	2.8200	1.5094	0.0101	2.5891	0.0119	0.0113	0.7	0.7
130	1300	0.0040	0.0120	2.8320	1.5195	0.0101	2.6010	0.0119	0.0113	0.7	0.7
131	1310	0.0040	0.0120	2.8440	1.5297	0.0101	2.6130	0.0119	0.0113	0.7	0.7
132	1320	0.0040	0.0120	2.8560	1.5398	0.0102	2.6249	0.0119	0.0113	0.7	0.7
133	1330	0.0040	0.0120	2.8680	1.5500	0.0102	2.6368	0.0119	0.0113	0.7	0.7
134	1340	0.0040	0.0120	2.8800	1.5601	0.0102	2.6488	0.0119	0.0113	0.7	0.7
135	1350	0.0040	0.0120	2.8920	1.5703	0.0102	2.6607	0.0119	0.0113	0.8	0.7
136	1360	0.0040	0.0120	2.9040	1.5805	0.0102	2.6727	0.0119	0.0113	0.8	0.8
137	1370	0.0040	0.0120	2.9160	1.5907	0.0102	2.6846	0.0119	0.0114	0.8	0.8
138	1380	0.0040	0.0120	2.9280	1.6010	0.0102	2.6966	0.0119	0.0114	0.8	0.8
139	1390	0.0040	0.0120	2.9400	1.6112	0.0102	2.7085	0.0119	0.0114	0.8	0.8
140	1400	0.0040	0.0120	2.9520	1.6214	0.0102	2.7205	0.0119	0.0114	0.8	0.8
141	1410	0.0040	0.0120	2.9640	1.6317	0.0102	2.7324	0.0119	0.0114	0.8	0.8

(1) Time Incre- ment	(2) Time (Min)	(3) Rainfall Distri- bution (% of Pt)	(4) Incre- mental Rainfall (in)	(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)	(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)	
142	1420	0.0040	0.0120	2.9760	1.6419	0.0103	2.7444	0.0119	0.0114	0.8	0.8	
143	1430	0.0040	0.0120	2.9880	1.6522	0.0103	2.7563	0.0119	0.0114	0.8	0.8	
144	1440	0.0040	0.0120	3.0000	1.6625	0.0103	2.7683	0.0119	0.0114	0.8	0.8	
Total		1.0000	3.0000							Hydrograph Volume (Cubic Feet)	94330	

Given:

Area = 7.84 acres
 Pt = 3 inches
 dt = 10 min.
 Tc = 42 min.
 w = 0.1064 routing constant

Pervious Area

Area = 7.84 acres
 CN = 86
 S = 1.63
 0.2S = 0.33

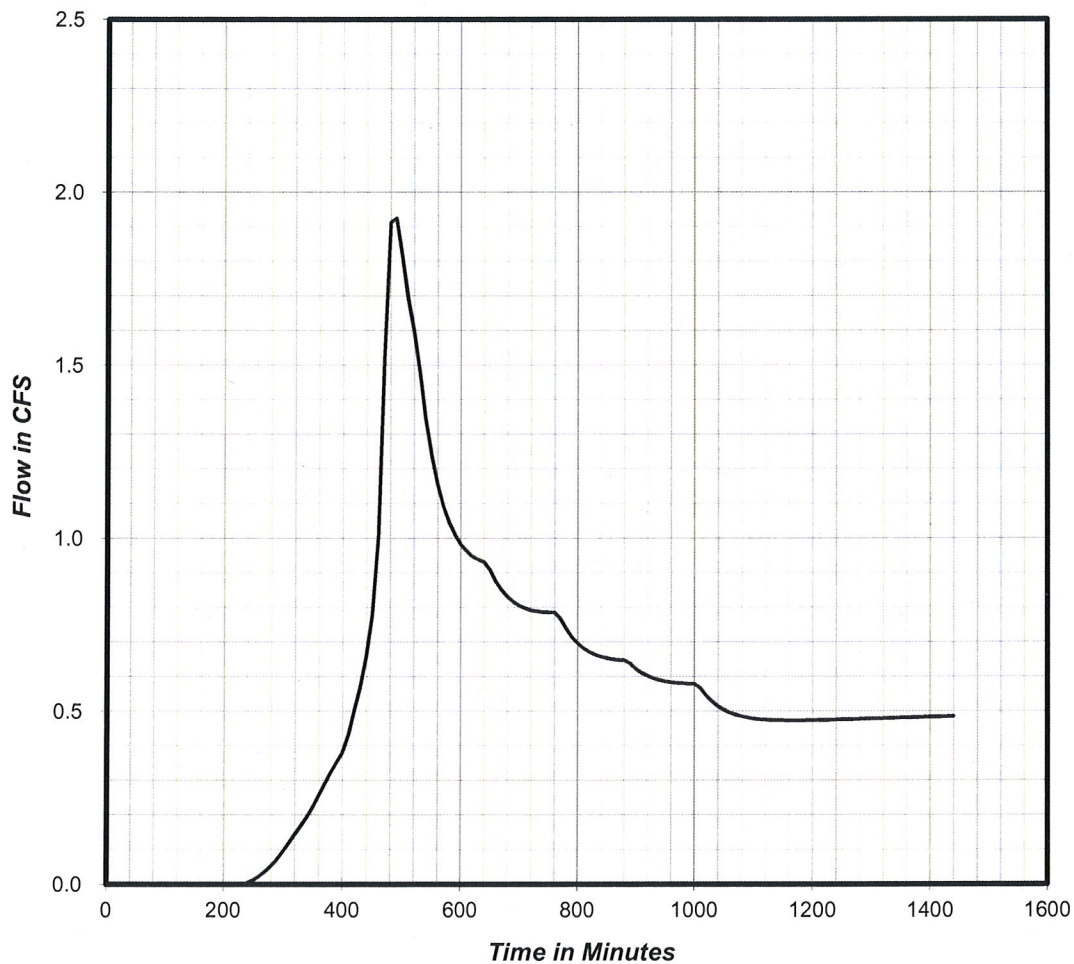
Impervious Area

Area = 0 acres
 CN = 98
 S = 0.20
 0.2S = 0.04

HYDROGRAPH RESULTS

Peak Runoff 1.9 cfs
 Total Vol. : 46089 cf

Peak Runoff Hydrograph



(1) Time Increment	(2) Time (Min)	(3) Rainfall Distribution (% of Pt)	(4) Incre- mental Rainfall (in)	Pervious Area			Impervious Area			(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)
				(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)				
1	10	0.0040	0.0120	0.0120	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0	
2	20	0.0040	0.0120	0.0240	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0	
3	30	0.0040	0.0120	0.0360	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0	
4	40	0.0040	0.0120	0.0480	0.0000	0.0000	0.0002	0.0002	0.0000	0.0	0.0	
5	50	0.0040	0.0120	0.0600	0.0000	0.0000	0.0016	0.0014	0.0000	0.0	0.0	
6	60	0.0040	0.0120	0.0720	0.0000	0.0000	0.0041	0.0025	0.0000	0.0	0.0	
7	70	0.0040	0.0120	0.0840	0.0000	0.0000	0.0075	0.0034	0.0000	0.0	0.0	
8	80	0.0040	0.0120	0.0960	0.0000	0.0000	0.0117	0.0042	0.0000	0.0	0.0	
9	90	0.0040	0.0120	0.1080	0.0000	0.0000	0.0166	0.0049	0.0000	0.0	0.0	
10	100	0.0040	0.0120	0.1200	0.0000	0.0000	0.0221	0.0055	0.0000	0.0	0.0	
11	110	0.0050	0.0150	0.1350	0.0000	0.0000	0.0297	0.0076	0.0000	0.0	0.0	
12	120	0.0050	0.0150	0.1500	0.0000	0.0000	0.0381	0.0083	0.0000	0.0	0.0	
13	130	0.0050	0.0150	0.1650	0.0000	0.0000	0.0470	0.0089	0.0000	0.0	0.0	
14	140	0.0050	0.0150	0.1800	0.0000	0.0000	0.0564	0.0095	0.0000	0.0	0.0	
15	150	0.0050	0.0150	0.1950	0.0000	0.0000	0.0664	0.0099	0.0000	0.0	0.0	
16	160	0.0050	0.0150	0.2100	0.0000	0.0000	0.0767	0.0103	0.0000	0.0	0.0	
17	170	0.0060	0.0180	0.2280	0.0000	0.0000	0.0895	0.0129	0.0000	0.0	0.0	
18	180	0.0060	0.0180	0.2460	0.0000	0.0000	0.1029	0.0133	0.0000	0.0	0.0	
19	190	0.0060	0.0180	0.2640	0.0000	0.0000	0.1166	0.0137	0.0000	0.0	0.0	
20	200	0.0060	0.0180	0.2820	0.0000	0.0000	0.1306	0.0141	0.0000	0.0	0.0	
21	210	0.0060	0.0180	0.3000	0.0000	0.0000	0.1450	0.0144	0.0000	0.0	0.0	
22	220	0.0060	0.0180	0.3180	0.0000	0.0000	0.1596	0.0146	0.0000	0.0	0.0	
23	230	0.0070	0.0210	0.3390	0.0001	0.0001	0.1770	0.0174	0.0001	0.0	0.0	
24	240	0.0070	0.0210	0.3600	0.0007	0.0006	0.1947	0.0177	0.0006	0.0	0.0	
25	250	0.0070	0.0210	0.3810	0.0018	0.0011	0.2126	0.0179	0.0011	0.1	0.0	
26	260	0.0070	0.0210	0.4020	0.0034	0.0016	0.2308	0.0182	0.0016	0.1	0.0	
27	270	0.0070	0.0210	0.4230	0.0055	0.0021	0.2491	0.0184	0.0021	0.1	0.0	
28	280	0.0070	0.0210	0.4440	0.0080	0.0025	0.2677	0.0185	0.0025	0.1	0.1	
29	290	0.0082	0.0246	0.4686	0.0116	0.0035	0.2896	0.0219	0.0035	0.2	0.1	
30	300	0.0082	0.0246	0.4932	0.0156	0.0041	0.3117	0.0221	0.0041	0.2	0.1	
31	310	0.0082	0.0246	0.5178	0.0203	0.0047	0.3341	0.0223	0.0047	0.2	0.1	
32	320	0.0082	0.0246	0.5424	0.0255	0.0052	0.3565	0.0225	0.0052	0.2	0.1	
33	330	0.0082	0.0246	0.5670	0.0312	0.0057	0.3791	0.0226	0.0057	0.3	0.2	
34	340	0.0082	0.0246	0.5916	0.0374	0.0062	0.4019	0.0227	0.0062	0.3	0.2	
35	350	0.0095	0.0285	0.6201	0.0451	0.0078	0.4284	0.0265	0.0078	0.4	0.2	
36	360	0.0095	0.0285	0.6486	0.0535	0.0084	0.4550	0.0266	0.0084	0.4	0.3	
37	370	0.0095	0.0285	0.6771	0.0624	0.0089	0.4818	0.0268	0.0089	0.4	0.3	
38	380	0.0095	0.0285	0.7056	0.0719	0.0095	0.5086	0.0269	0.0095	0.5	0.3	
39	390	0.0095	0.0285	0.7341	0.0820	0.0100	0.5356	0.0270	0.0100	0.5	0.4	
40	400	0.0095	0.0285	0.7626	0.0925	0.0105	0.5627	0.0271	0.0105	0.5	0.4	
41	410	0.0134	0.0402	0.8028	0.1082	0.0157	0.6010	0.0383	0.0157	0.7	0.4	
42	420	0.0134	0.0402	0.8430	0.1248	0.0166	0.6395	0.0385	0.0166	0.8	0.5	
43	430	0.0134	0.0402	0.8832	0.1423	0.0175	0.6781	0.0386	0.0175	0.8	0.6	
44	440	0.0180	0.0540	0.9372	0.1670	0.0248	0.7301	0.0520	0.0248	1.2	0.7	
45	450	0.0180	0.0540	0.9912	0.1932	0.0261	0.7824	0.0522	0.0261	1.2	0.8	
46	460	0.0340	0.1020	1.0932	0.2460	0.0528	0.8815	0.0991	0.0528	2.5	1.0	
47	470	0.0540	0.1620	1.2552	0.3379	0.0919	1.0397	0.1582	0.0919	4.4	1.5	
48	480	0.0270	0.0810	1.3362	0.3871	0.0492	1.1191	0.0794	0.0492	2.3	1.9	
49	490	0.0180	0.0540	1.3902	0.4209	0.0339	1.1721	0.0530	0.0339	1.6	1.9	
50	500	0.0134	0.0402	1.4304	0.4467	0.0257	1.2116	0.0395	0.0257	1.2	1.8	
51	510	0.0134	0.0402	1.4706	0.4728	0.0261	1.2512	0.0396	0.0261	1.2	1.7	
52	520	0.0134	0.0402	1.5108	0.4994	0.0265	1.2908	0.0396	0.0265	1.3	1.6	
53	530	0.0088	0.0264	1.5372	0.5170	0.0176	1.3168	0.0260	0.0176	0.8	1.5	
54	540	0.0088	0.0264	1.5636	0.5348	0.0178	1.3428	0.0260	0.0178	0.8	1.3	
55	550	0.0088	0.0264	1.5900	0.5528	0.0180	1.3689	0.0260	0.0180	0.9	1.2	
56	560	0.0088	0.0264	1.6164	0.5709	0.0181	1.3949	0.0260	0.0181	0.9	1.2	
57	570	0.0088	0.0264	1.6428	0.5891	0.0183	1.4210	0.0261	0.0183	0.9	1.1	
58	580	0.0088	0.0264	1.6692	0.6075	0.0184	1.4470	0.0261	0.0184	0.9	1.0	
59	590	0.0088	0.0264	1.6956	0.6261	0.0185	1.4731	0.0261	0.0185	0.9	1.0	
60	600	0.0088	0.0264	1.7220	0.6448	0.0187	1.4992	0.0261	0.0187	0.9	1.0	
61	610	0.0088	0.0264	1.7484	0.6636	0.0188	1.5253	0.0261	0.0188	0.9	1.0	
62	620	0.0088	0.0264	1.7748	0.6825	0.0189	1.5514	0.0261	0.0189	0.9	0.9	
63	630	0.0088	0.0264	1.8012	0.7016	0.0191	1.5775	0.0261	0.0191	0.9	0.9	
64	640	0.0088	0.0264	1.8276	0.7208	0.0192	1.6036	0.0261	0.0192	0.9	0.9	
65	650	0.0072	0.0216	1.8492	0.7366	0.0158	1.6250	0.0214	0.0158	0.7	0.9	
66	660	0.0072	0.0216	1.8708	0.7525	0.0159	1.6464	0.0214	0.0159	0.8	0.9	
67	670	0.0072	0.0216	1.8924	0.7684	0.0160	1.6678	0.0214	0.0160	0.8	0.9	
68	680	0.0072	0.0216	1.9140	0.7845	0.0160	1.6892	0.0214	0.0160	0.8	0.8	

(1) Time Increment	(2) Time (Min)	(3) Rainfall Distri- bution (% of Pt)	(4) Incre- mental Rainfall (in)	(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)	(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)
69	690	0.0072	0.0216	1.9356	0.8006	0.0161	1.7105	0.0214	0.0161	0.8	0.8
70	700	0.0072	0.0216	1.9572	0.8167	0.0162	1.7319	0.0214	0.0162	0.8	0.8
71	710	0.0072	0.0216	1.9788	0.8330	0.0162	1.7533	0.0214	0.0162	0.8	0.8

(1) Time Increment	(2) Time (Min)	(3) Rainfall Distri- bution (% of Pt)	(4) Incre- mental Rainfall (in)	(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)	(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)
72	720	0.0072	0.0216	2.0004	0.8493	0.0163	1.7748	0.0214	0.0163	0.8	0.8
73	730	0.0072	0.0216	2.0220	0.8657	0.0164	1.7962	0.0214	0.0164	0.8	0.8
74	740	0.0072	0.0216	2.0436	0.8821	0.0165	1.8176	0.0214	0.0165	0.8	0.8
75	750	0.0072	0.0216	2.0652	0.8987	0.0165	1.8390	0.0214	0.0165	0.8	0.8
76	760	0.0072	0.0216	2.0868	0.9152	0.0166	1.8604	0.0214	0.0166	0.8	0.8
77	770	0.0057	0.0171	2.1039	0.9284	0.0132	1.8774	0.0170	0.0132	0.6	0.8
78	780	0.0057	0.0171	2.1210	0.9416	0.0132	1.8943	0.0170	0.0132	0.6	0.7
79	790	0.0057	0.0171	2.1381	0.9549	0.0133	1.9113	0.0170	0.0133	0.6	0.7
80	800	0.0057	0.0171	2.1552	0.9682	0.0133	1.9283	0.0170	0.0133	0.6	0.7
81	810	0.0057	0.0171	2.1723	0.9815	0.0133	1.9452	0.0170	0.0133	0.6	0.7
82	820	0.0057	0.0171	2.1894	0.9949	0.0134	1.9622	0.0170	0.0134	0.6	0.7
83	830	0.0057	0.0171	2.2065	1.0083	0.0134	1.9792	0.0170	0.0134	0.6	0.7
84	840	0.0057	0.0171	2.2236	1.0217	0.0134	1.9962	0.0170	0.0134	0.6	0.7
85	850	0.0057	0.0171	2.2407	1.0352	0.0135	2.0131	0.0170	0.0135	0.6	0.7
86	860	0.0057	0.0171	2.2578	1.0487	0.0135	2.0301	0.0170	0.0135	0.6	0.7
87	870	0.0057	0.0171	2.2749	1.0622	0.0135	2.0471	0.0170	0.0135	0.6	0.6
88	880	0.0057	0.0171	2.2920	1.0758	0.0136	2.0641	0.0170	0.0136	0.6	0.6
89	890	0.0050	0.0150	2.3070	1.0877	0.0119	2.0790	0.0149	0.0119	0.6	0.6
90	900	0.0050	0.0150	2.3220	1.0997	0.0120	2.0939	0.0149	0.0120	0.6	0.6
91	910	0.0050	0.0150	2.3370	1.1117	0.0120	2.1088	0.0149	0.0120	0.6	0.6
92	920	0.0050	0.0150	2.3520	1.1237	0.0120	2.1237	0.0149	0.0120	0.6	0.6
93	930	0.0050	0.0150	2.3670	1.1357	0.0120	2.1386	0.0149	0.0120	0.6	0.6
94	940	0.0050	0.0150	2.3820	1.1478	0.0121	2.1535	0.0149	0.0121	0.6	0.6
95	950	0.0050	0.0150	2.3970	1.1599	0.0121	2.1684	0.0149	0.0121	0.6	0.6
96	960	0.0050	0.0150	2.4120	1.1720	0.0121	2.1833	0.0149	0.0121	0.6	0.6
97	970	0.0050	0.0150	2.4270	1.1841	0.0121	2.1982	0.0149	0.0121	0.6	0.6
98	980	0.0050	0.0150	2.4420	1.1963	0.0122	2.2131	0.0149	0.0122	0.6	0.6
99	990	0.0050	0.0150	2.4570	1.2084	0.0122	2.2280	0.0149	0.0122	0.6	0.6
100	1000	0.0050	0.0150	2.4720	1.2206	0.0122	2.2429	0.0149	0.0122	0.6	0.6
101	1010	0.0040	0.0120	2.4840	1.2304	0.0098	2.2548	0.0119	0.0098	0.5	0.6
102	1020	0.0040	0.0120	2.4960	1.2402	0.0098	2.2668	0.0119	0.0098	0.5	0.5
103	1030	0.0040	0.0120	2.5080	1.2500	0.0098	2.2787	0.0119	0.0098	0.5	0.5
104	1040	0.0040	0.0120	2.5200	1.2598	0.0098	2.2906	0.0119	0.0098	0.5	0.5
105	1050	0.0040	0.0120	2.5320	1.2697	0.0098	2.3026	0.0119	0.0098	0.5	0.5
106	1060	0.0040	0.0120	2.5440	1.2795	0.0098	2.3145	0.0119	0.0098	0.5	0.5
107	1070	0.0040	0.0120	2.5560	1.2894	0.0099	2.3264	0.0119	0.0099	0.5	0.5
108	1080	0.0040	0.0120	2.5680	1.2992	0.0099	2.3384	0.0119	0.0099	0.5	0.5
109	1090	0.0040	0.0120	2.5800	1.3091	0.0099	2.3503	0.0119	0.0099	0.5	0.5
110	1100	0.0040	0.0120	2.5920	1.3190	0.0099	2.3622	0.0119	0.0099	0.5	0.5
111	1110	0.0040	0.0120	2.6040	1.3289	0.0099	2.3742	0.0119	0.0099	0.5	0.5
112	1120	0.0040	0.0120	2.6160	1.3388	0.0099	2.3861	0.0119	0.0099	0.5	0.5
113	1130	0.0040	0.0120	2.6280	1.3488	0.0099	2.3980	0.0119	0.0099	0.5	0.5
114	1140	0.0040	0.0120	2.6400	1.3587	0.0099	2.4100	0.0119	0.0099	0.5	0.5
115	1150	0.0040	0.0120	2.6520	1.3687	0.0100	2.4219	0.0119	0.0100	0.5	0.5
116	1160	0.0040	0.0120	2.6640	1.3787	0.0100	2.4338	0.0119	0.0100	0.5	0.5
117	1170	0.0040	0.0120	2.6760	1.3886	0.0100	2.4458	0.0119	0.0100	0.5	0.5
118	1180	0.0040	0.0120	2.6880	1.3986	0.0100	2.4577	0.0119	0.0100	0.5	0.5
119	1190	0.0040	0.0120	2.7000	1.4086	0.0100	2.4696	0.0119	0.0100	0.5	0.5
120	1200	0.0040	0.0120	2.7120	1.4187	0.0100	2.4816	0.0119	0.0100	0.5	0.5
121	1210	0.0040	0.0120	2.7240	1.4287	0.0100	2.4935	0.0119	0.0100	0.5	0.5
122	1220	0.0040	0.0120	2.7360	1.4387	0.0100	2.5055	0.0119	0.0100	0.5	0.5
123	1230	0.0040	0.0120	2.7480	1.4488	0.0101	2.5174	0.0119	0.0101	0.5	0.5
124	1240	0.0040	0.0120	2.7600	1.4589	0.0101	2.5293	0.0119	0.0101	0.5	0.5
125	1250	0.0040	0.0120	2.7720	1.4689	0.0101	2.5413	0.0119	0.0101	0.5	0.5
126	1260	0.0040	0.0120	2.7840	1.4790	0.0101	2.5532	0.0119	0.0101	0.5	0.5
127	1270	0.0040	0.0120	2.7960	1.4891	0.0101	2.5652	0.0119	0.0101	0.5	0.5
128	1280	0.0040	0.0120	2.8080	1.4992	0.0101	2.5771	0.0119	0.0101	0.5	0.5
129	1290	0.0040	0.0120	2.8200	1.5094	0.0101	2.5891	0.0119	0.0101	0.5	0.5
130	1300	0.0040	0.0120	2.8320	1.5195	0.0101	2.6010	0.0119	0.0101	0.5	0.5
131	1310	0.0040	0.0120	2.8440	1.5297	0.0101	2.6130	0.0119	0.0101	0.5	0.5
132	1320	0.0040	0.0120	2.8560	1.5398	0.0102	2.6249	0.0119	0.0102	0.5	0.5
133	1330	0.0040	0.0120	2.8680	1.5500	0.0102	2.6368	0.0119	0.0102	0.5	0.5
134	1340	0.0040	0.0120	2.8800	1.5601	0.0102	2.6488	0.0119	0.0102	0.5	0.5
135	1350	0.0040	0.0120	2.8920	1.5703	0.0102	2.6607	0.0119	0.0102	0.5	0.5
136	1360	0.0040	0.0120	2.9040	1.5805	0.0102	2.6727	0.0119	0.0102	0.5	0.5
137	1370	0.0040	0.0120	2.9160	1.5907	0.0102	2.6846	0.0119	0.0102	0.5	0.5
138	1380	0.0040	0.0120	2.9280	1.6010	0.0102	2.6966	0.0119	0.0102	0.5	0.5
139	1390	0.0040	0.0120	2.9400	1.6112	0.0102	2.7085	0.0119	0.0102	0.5	0.5
140	1400	0.0040	0.0120	2.9520	1.6214	0.0102	2.7205	0.0119	0.0102	0.5	0.5
141	1410	0.0040	0.0120	2.9640	1.6317	0.0102	2.7324	0.0119	0.0102	0.5	0.5

(1) Time Incre- ment	(2) Time (Min)	(3) Rainfall Distri- bution (% of Pt)	(4) Incre- mental Rainfall (in)	(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)	(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)	
142	1420	0.0040	0.0120	2.9760	1.6419	0.0103	2.7444	0.0119	0.0103	0.5	0.5	
143	1430	0.0040	0.0120	2.9880	1.6522	0.0103	2.7563	0.0119	0.0103	0.5	0.5	
144	1440	0.0040	0.0120	3.0000	1.6625	0.0103	2.7683	0.0119	0.0103	0.5	0.5	
Total		1.0000	3.0000							Hydrograph Volume (Cubic Feet)		46089

Given:

Area = 7.84 acres
Pt = 3 inches
dt = 10 min.
Tc = 10 min.
w = 0.3333 routing constant

Pervious Area

Area = 4.95 acres
CN = 86
S = 1.63
0.2S = 0.33

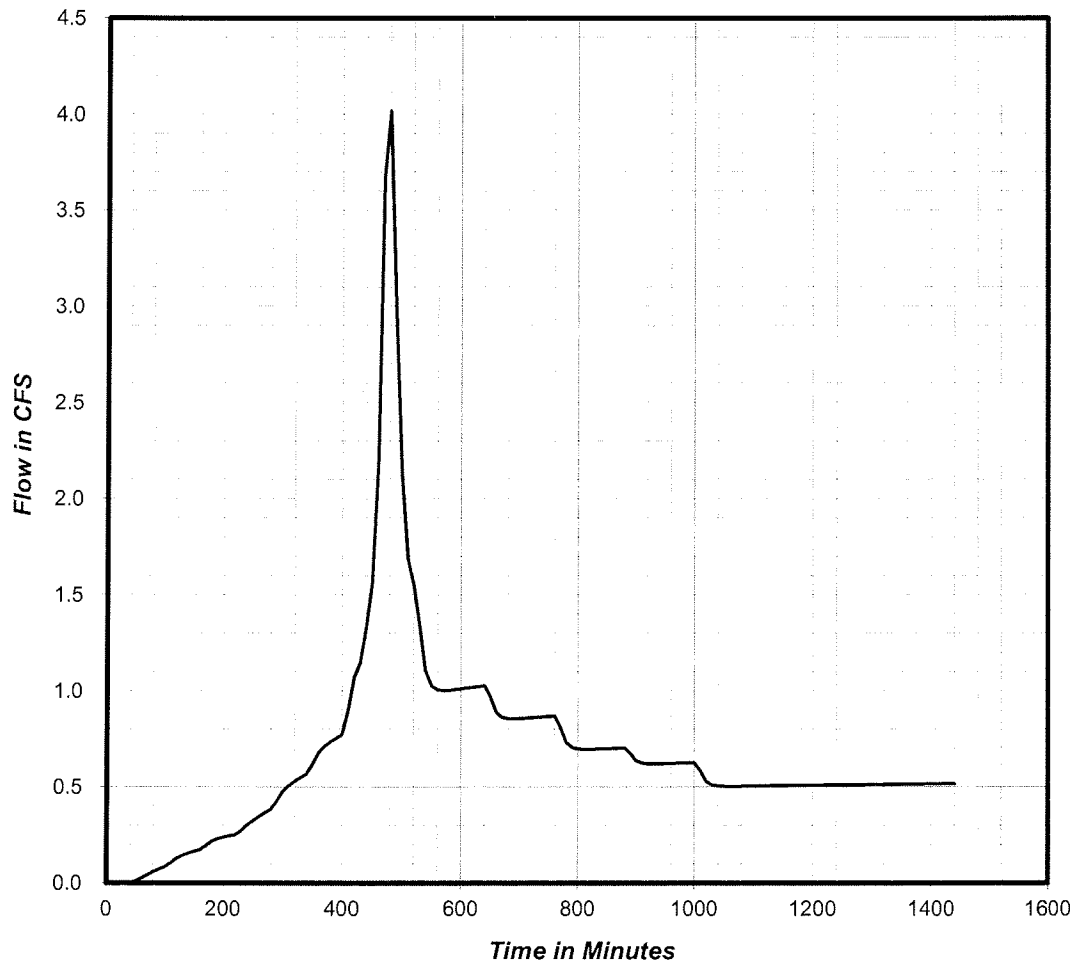
Impervious Area

Area = 2.89 acres
CN = 98
S = 0.20
0.2S = 0.04

HYDROGRAPH RESULTS

Peak Runoff 4.0 cfs
Total Vol. : 58603 cf

Peak Runoff Hydrograph

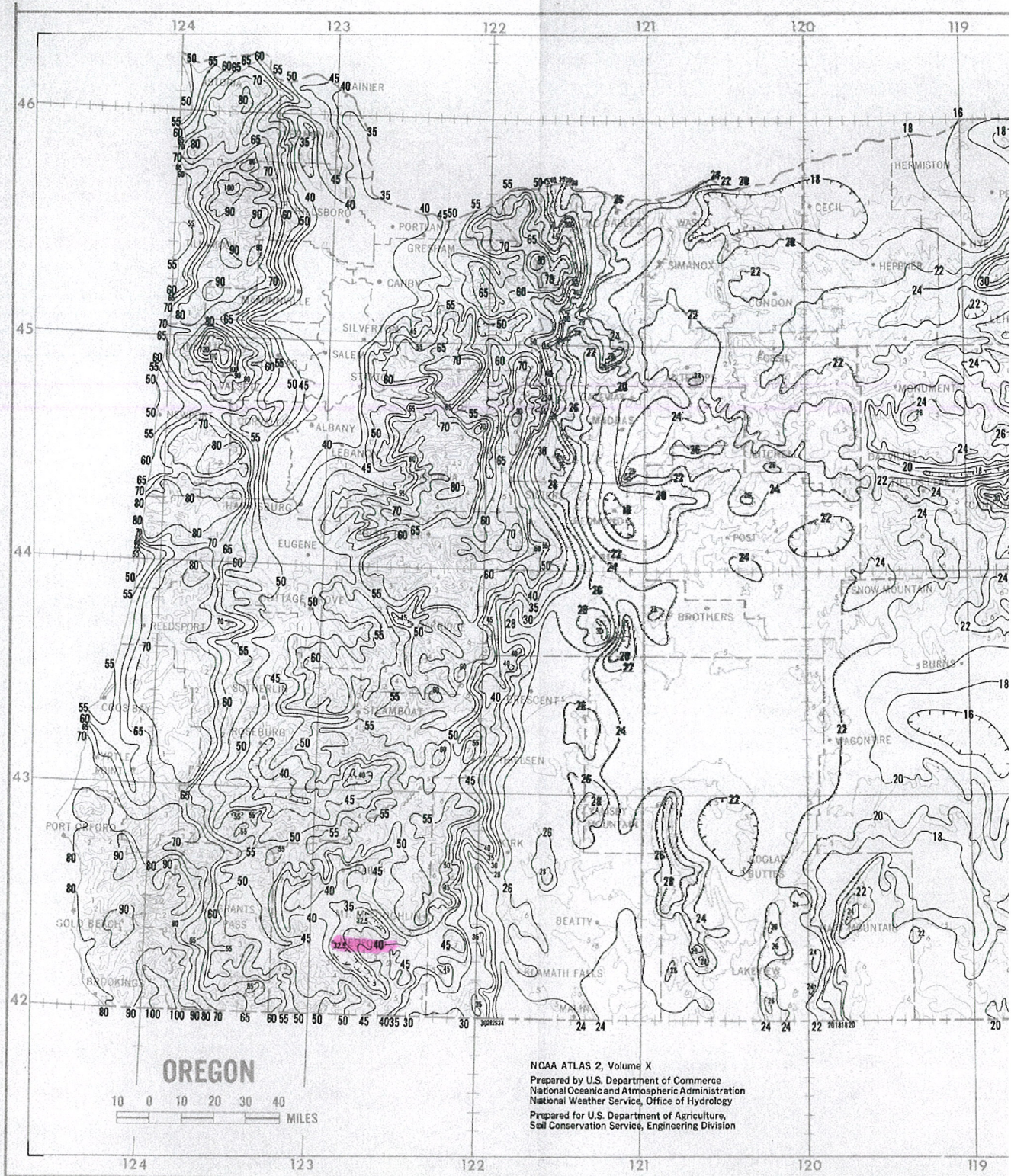


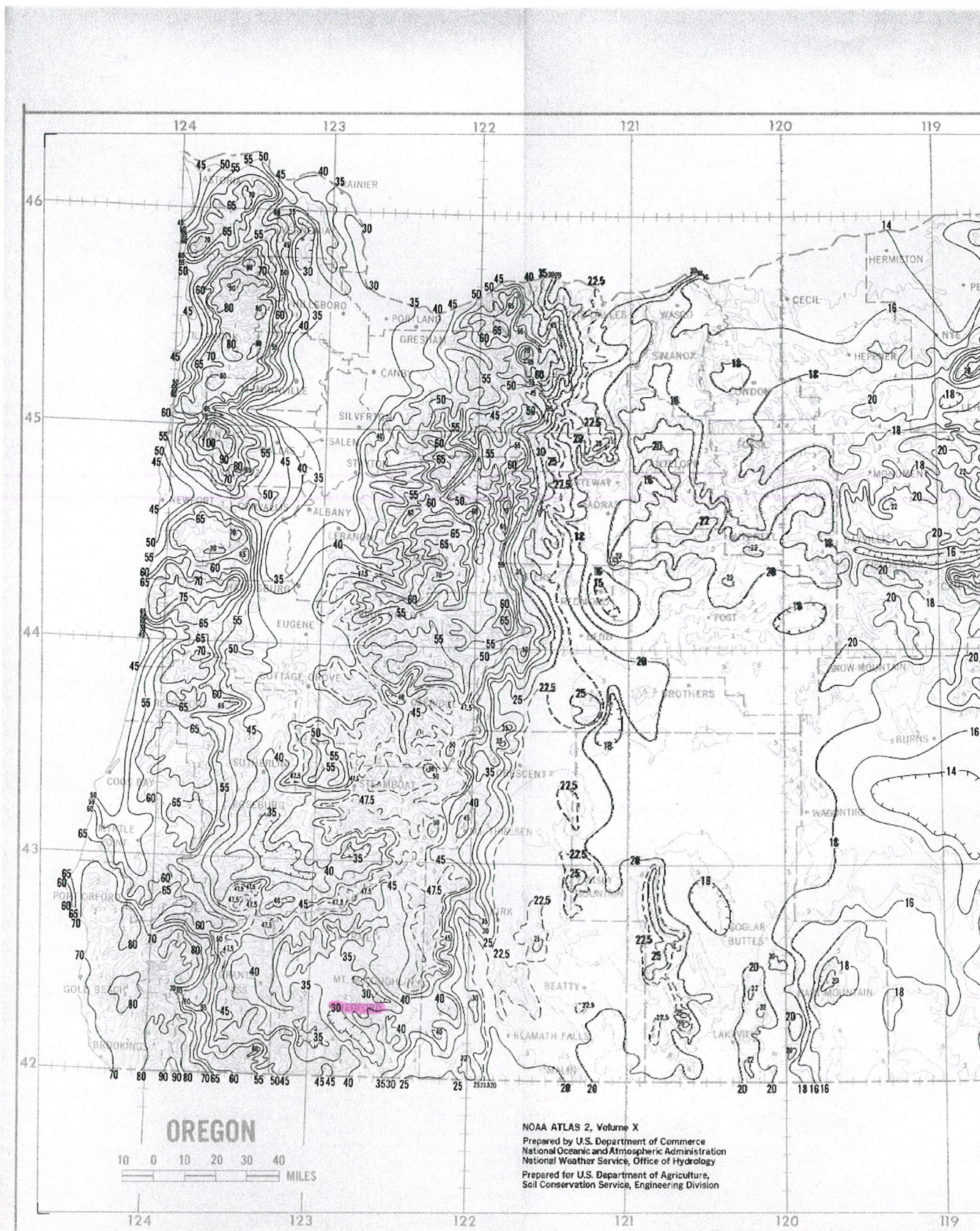
(1) Time Increment	(2) Time (Min)	(3) Rainfall Distri- bution (% of Pt)	(4) Incre- mental Rainfall (in)	Pervious Area			Impervious Area			(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)
				(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)				
1	10	0.0040	0.0120	0.0120	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0
2	20	0.0040	0.0120	0.0240	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0
3	30	0.0040	0.0120	0.0360	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0	0.0
4	40	0.0040	0.0120	0.0480	0.0000	0.0000	0.0002	0.0002	0.0002	0.0001	0.0	0.0
5	50	0.0040	0.0120	0.0600	0.0000	0.0000	0.0016	0.0014	0.0005	0.0005	0.0	0.0
6	60	0.0040	0.0120	0.0720	0.0000	0.0000	0.0041	0.0025	0.0009	0.0009	0.0	0.0
7	70	0.0040	0.0120	0.0840	0.0000	0.0000	0.0075	0.0034	0.0013	0.0013	0.1	0.0
8	80	0.0040	0.0120	0.0960	0.0000	0.0000	0.0117	0.0042	0.0015	0.0015	0.1	0.1
9	90	0.0040	0.0120	0.1080	0.0000	0.0000	0.0166	0.0049	0.0018	0.0018	0.1	0.1
10	100	0.0040	0.0120	0.1200	0.0000	0.0000	0.0221	0.0055	0.0020	0.0020	0.1	0.1
11	110	0.0050	0.0150	0.1350	0.0000	0.0000	0.0297	0.0076	0.0028	0.0028	0.1	0.1
12	120	0.0050	0.0150	0.1500	0.0000	0.0000	0.0381	0.0083	0.0031	0.0031	0.1	0.1
13	130	0.0050	0.0150	0.1650	0.0000	0.0000	0.0470	0.0089	0.0033	0.0033	0.2	0.1
14	140	0.0050	0.0150	0.1800	0.0000	0.0000	0.0564	0.0095	0.0035	0.0035	0.2	0.2
15	150	0.0050	0.0150	0.1950	0.0000	0.0000	0.0664	0.0099	0.0037	0.0037	0.2	0.2
16	160	0.0050	0.0150	0.2100	0.0000	0.0000	0.0767	0.0103	0.0038	0.0038	0.2	0.2
17	170	0.0060	0.0180	0.2280	0.0000	0.0000	0.0895	0.0129	0.0047	0.0047	0.2	0.2
18	180	0.0060	0.0180	0.2460	0.0000	0.0000	0.1029	0.0133	0.0049	0.0049	0.2	0.2
19	190	0.0060	0.0180	0.2640	0.0000	0.0000	0.1166	0.0137	0.0051	0.0051	0.2	0.2
20	200	0.0060	0.0180	0.2820	0.0000	0.0000	0.1306	0.0141	0.0052	0.0052	0.2	0.2
21	210	0.0060	0.0180	0.3000	0.0000	0.0000	0.1450	0.0144	0.0053	0.0053	0.3	0.2
22	220	0.0060	0.0180	0.3180	0.0000	0.0000	0.1596	0.0146	0.0054	0.0054	0.3	0.3
23	230	0.0070	0.0210	0.3390	0.0001	0.0001	0.1770	0.0174	0.0065	0.0065	0.3	0.3
24	240	0.0070	0.0210	0.3600	0.0007	0.0006	0.1947	0.0177	0.0069	0.0069	0.3	0.3
25	250	0.0070	0.0210	0.3810	0.0018	0.0011	0.2126	0.0179	0.0073	0.0073	0.3	0.3
26	260	0.0070	0.0210	0.4020	0.0034	0.0016	0.2308	0.0182	0.0077	0.0077	0.4	0.3
27	270	0.0070	0.0210	0.4230	0.0055	0.0021	0.2491	0.0184	0.0081	0.0081	0.4	0.4
28	280	0.0070	0.0210	0.4440	0.0080	0.0025	0.2677	0.0185	0.0084	0.0084	0.4	0.4
29	290	0.0082	0.0246	0.4686	0.0116	0.0035	0.2896	0.0219	0.0103	0.0103	0.5	0.4
30	300	0.0082	0.0246	0.4932	0.0156	0.0041	0.3117	0.0221	0.0107	0.0107	0.5	0.5
31	310	0.0082	0.0246	0.5178	0.0203	0.0047	0.3341	0.0223	0.0112	0.0112	0.5	0.5
32	320	0.0082	0.0246	0.5424	0.0255	0.0052	0.3565	0.0225	0.0116	0.0116	0.5	0.5
33	330	0.0082	0.0246	0.5670	0.0312	0.0057	0.3791	0.0226	0.0119	0.0119	0.6	0.5
34	340	0.0082	0.0246	0.5916	0.0374	0.0062	0.4019	0.0227	0.0123	0.0123	0.6	0.6
35	350	0.0095	0.0285	0.6201	0.0451	0.0078	0.4284	0.0265	0.0147	0.0147	0.7	0.6
36	360	0.0095	0.0285	0.6486	0.0535	0.0084	0.4550	0.0266	0.0151	0.0151	0.7	0.7
37	370	0.0095	0.0285	0.6771	0.0624	0.0089	0.4818	0.0268	0.0155	0.0155	0.7	0.7
38	380	0.0095	0.0285	0.7056	0.0719	0.0095	0.5086	0.0269	0.0159	0.0159	0.8	0.7
39	390	0.0095	0.0285	0.7341	0.0820	0.0100	0.5356	0.0270	0.0163	0.0163	0.8	0.8
40	400	0.0095	0.0285	0.7626	0.0925	0.0105	0.5627	0.0271	0.0166	0.0166	0.8	0.8
41	410	0.0134	0.0402	0.8028	0.1082	0.0157	0.6010	0.0383	0.0240	0.0240	1.1	0.9
42	420	0.0134	0.0402	0.8430	0.1248	0.0166	0.6395	0.0385	0.0247	0.0247	1.2	1.1
43	430	0.0134	0.0402	0.8832	0.1423	0.0175	0.6781	0.0386	0.0253	0.0253	1.2	1.1
44	440	0.0180	0.0540	0.9372	0.1670	0.0248	0.7301	0.0520	0.0348	0.0348	1.7	1.3
45	450	0.0180	0.0540	0.9912	0.1932	0.0261	0.7824	0.0522	0.0358	0.0358	1.7	1.6
46	460	0.0340	0.1020	1.0932	0.2460	0.0528	0.8815	0.0991	0.0699	0.0699	3.3	2.2
47	470	0.0540	0.1620	1.2552	0.3379	0.0919	1.0397	0.1582	0.1164	0.1164	5.5	3.7
48	480	0.0270	0.0810	1.3362	0.3871	0.0492	1.1191	0.0794	0.0603	0.0603	2.9	4.0
49	490	0.0180	0.0540	1.3902	0.4209	0.0339	1.1721	0.0530	0.0409	0.0409	1.9	2.9
50	500	0.0134	0.0402	1.4304	0.4467	0.0257	1.2116	0.0395	0.0308	0.0308	1.5	2.1
51	510	0.0134	0.0402	1.4706	0.4728	0.0261	1.2512	0.0396	0.0311	0.0311	1.5	1.7
52	520	0.0134	0.0402	1.5108	0.4994	0.0265	1.2908	0.0396	0.0314	0.0314	1.5	1.5
53	530	0.0088	0.0264	1.5372	0.5170	0.0176	1.3168	0.0260	0.0207	0.0207	1.0	1.3
54	540	0.0088	0.0264	1.5636	0.5348	0.0178	1.3428	0.0260	0.0208	0.0208	1.0	1.1
55	550	0.0088	0.0264	1.5900	0.5528	0.0180	1.3689	0.0260	0.0209	0.0209	1.0	1.0
56	560	0.0088	0.0264	1.6164	0.5709	0.0181	1.3949	0.0260	0.0210	0.0210	1.0	1.0
57	570	0.0088	0.0264	1.6428	0.5891	0.0183	1.4210	0.0261	0.0211	0.0211	1.0	1.0
58	580	0.0088	0.0264	1.6692	0.6075	0.0184	1.4470	0.0261	0.0212	0.0212	1.0	1.0
59	590	0.0088	0.0264	1.6956	0.6261	0.0185	1.4731	0.0261	0.0213	0.0213	1.0	1.0
60	600	0.0088	0.0264	1.7220	0.6448	0.0187	1.4992	0.0261	0.0214	0.0214	1.0	1.0
61	610	0.0088	0.0264	1.7484	0.6636	0.0188	1.5253	0.0261	0.0215	0.0215	1.0	1.0
62	620	0.0088	0.0264	1.7748	0.6825	0.0189	1.5514	0.0261	0.0216	0.0216	1.0	1.0
63	630	0.0088	0.0264	1.8012	0.7016	0.0191	1.5775	0.0261	0.0217	0.0217	1.0	1.0
64	640	0.0088	0.0264	1.8276	0.7208	0.0192	1.6036	0.0261	0.0217	0.0217	1.0	1.0
65	650	0.0072	0.0216	1.8492	0.7366	0.0158	1.6250	0.0214	0.0179	0.0179	0.8	1.0
66	660	0.0072	0.0216	1.8708	0.7525	0.0159	1.6464	0.0214	0.0179	0.0179	0.8	0.9
67	670	0.0072	0.0216	1.8924	0.7684	0.0160	1.6678	0.0214	0.0180	0.0180	0.9	0.9
68	680	0.0072	0.0216	1.9140	0.7845	0.0160	1.6892	0.0214	0.0180	0.0180	0.9	0.9

(1) Time Increment	(2) Time (Min)	(3) Rainfall Distri- bution (% of Pt)	(4) Incre- mental Rainfall (in)	(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)	(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)
69	690	0.0072	0.0216	1.9356	0.8006	0.0161	1.7105	0.0214	0.0181	0.9	0.9
70	700	0.0072	0.0216	1.9572	0.8167	0.0162	1.7319	0.0214	0.0181	0.9	0.9
71	710	0.0072	0.0216	1.9788	0.8330	0.0162	1.7533	0.0214	0.0181	0.9	0.9

(1) Time Incre- ment	(2) Time (Min)	(3) Rainfall Distri- bution (% of Pt)	(4) Incre- mental Rainfall (in)	(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)	(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)
72	720	0.0072	0.0216	2.0004	0.8493	0.0163	1.7748	0.0214	0.0182	0.9	0.9
73	730	0.0072	0.0216	2.0220	0.8657	0.0164	1.7962	0.0214	0.0182	0.9	0.9
74	740	0.0072	0.0216	2.0436	0.8821	0.0165	1.8176	0.0214	0.0183	0.9	0.9
75	750	0.0072	0.0216	2.0652	0.8987	0.0165	1.8390	0.0214	0.0183	0.9	0.9
76	760	0.0072	0.0216	2.0868	0.9152	0.0166	1.8604	0.0214	0.0184	0.9	0.9
77	770	0.0057	0.0171	2.1039	0.9284	0.0132	1.8774	0.0170	0.0146	0.7	0.8
78	780	0.0057	0.0171	2.1210	0.9416	0.0132	1.8943	0.0170	0.0146	0.7	0.7
79	790	0.0057	0.0171	2.1381	0.9549	0.0133	1.9113	0.0170	0.0146	0.7	0.7
80	800	0.0057	0.0171	2.1552	0.9682	0.0133	1.9283	0.0170	0.0146	0.7	0.7
81	810	0.0057	0.0171	2.1723	0.9815	0.0133	1.9452	0.0170	0.0147	0.7	0.7
82	820	0.0057	0.0171	2.1894	0.9949	0.0134	1.9622	0.0170	0.0147	0.7	0.7
83	830	0.0057	0.0171	2.2065	1.0083	0.0134	1.9792	0.0170	0.0147	0.7	0.7
84	840	0.0057	0.0171	2.2236	1.0217	0.0134	1.9962	0.0170	0.0147	0.7	0.7
85	850	0.0057	0.0171	2.2407	1.0352	0.0135	2.0131	0.0170	0.0148	0.7	0.7
86	860	0.0057	0.0171	2.2578	1.0487	0.0135	2.0301	0.0170	0.0148	0.7	0.7
87	870	0.0057	0.0171	2.2749	1.0622	0.0135	2.0471	0.0170	0.0148	0.7	0.7
88	880	0.0057	0.0171	2.2920	1.0758	0.0136	2.0641	0.0170	0.0148	0.7	0.7
89	890	0.0050	0.0150	2.3070	1.0877	0.0119	2.0790	0.0149	0.0130	0.6	0.7
90	900	0.0050	0.0150	2.3220	1.0997	0.0120	2.0939	0.0149	0.0130	0.6	0.6
91	910	0.0050	0.0150	2.3370	1.1117	0.0120	2.1088	0.0149	0.0131	0.6	0.6
92	920	0.0050	0.0150	2.3520	1.1237	0.0120	2.1237	0.0149	0.0131	0.6	0.6
93	930	0.0050	0.0150	2.3670	1.1357	0.0120	2.1386	0.0149	0.0131	0.6	0.6
94	940	0.0050	0.0150	2.3820	1.1478	0.0121	2.1535	0.0149	0.0131	0.6	0.6
95	950	0.0050	0.0150	2.3970	1.1599	0.0121	2.1684	0.0149	0.0131	0.6	0.6
96	960	0.0050	0.0150	2.4120	1.1720	0.0121	2.1833	0.0149	0.0131	0.6	0.6
97	970	0.0050	0.0150	2.4270	1.1841	0.0121	2.1982	0.0149	0.0132	0.6	0.6
98	980	0.0050	0.0150	2.4420	1.1963	0.0122	2.2131	0.0149	0.0132	0.6	0.6
99	990	0.0050	0.0150	2.4570	1.2084	0.0122	2.2280	0.0149	0.0132	0.6	0.6
100	1000	0.0050	0.0150	2.4720	1.2206	0.0122	2.2429	0.0149	0.0132	0.6	0.6
101	1010	0.0040	0.0120	2.4840	1.2304	0.0098	2.2548	0.0119	0.0106	0.5	0.6
102	1020	0.0040	0.0120	2.4960	1.2402	0.0098	2.2668	0.0119	0.0106	0.5	0.5
103	1030	0.0040	0.0120	2.5080	1.2500	0.0098	2.2787	0.0119	0.0106	0.5	0.5
104	1040	0.0040	0.0120	2.5200	1.2598	0.0098	2.2906	0.0119	0.0106	0.5	0.5
105	1050	0.0040	0.0120	2.5320	1.2697	0.0098	2.3026	0.0119	0.0106	0.5	0.5
106	1060	0.0040	0.0120	2.5440	1.2795	0.0098	2.3145	0.0119	0.0106	0.5	0.5
107	1070	0.0040	0.0120	2.5560	1.2894	0.0099	2.3264	0.0119	0.0106	0.5	0.5
108	1080	0.0040	0.0120	2.5680	1.2992	0.0099	2.3384	0.0119	0.0106	0.5	0.5
109	1090	0.0040	0.0120	2.5800	1.3091	0.0099	2.3503	0.0119	0.0106	0.5	0.5
110	1100	0.0040	0.0120	2.5920	1.3190	0.0099	2.3622	0.0119	0.0106	0.5	0.5
111	1110	0.0040	0.0120	2.6040	1.3289	0.0099	2.3742	0.0119	0.0107	0.5	0.5
112	1120	0.0040	0.0120	2.6160	1.3388	0.0099	2.3861	0.0119	0.0107	0.5	0.5
113	1130	0.0040	0.0120	2.6280	1.3488	0.0099	2.3980	0.0119	0.0107	0.5	0.5
114	1140	0.0040	0.0120	2.6400	1.3587	0.0099	2.4100	0.0119	0.0107	0.5	0.5
115	1150	0.0040	0.0120	2.6520	1.3687	0.0100	2.4219	0.0119	0.0107	0.5	0.5
116	1160	0.0040	0.0120	2.6640	1.3787	0.0100	2.4338	0.0119	0.0107	0.5	0.5
117	1170	0.0040	0.0120	2.6760	1.3886	0.0100	2.4458	0.0119	0.0107	0.5	0.5
118	1180	0.0040	0.0120	2.6880	1.3986	0.0100	2.4577	0.0119	0.0107	0.5	0.5
119	1190	0.0040	0.0120	2.7000	1.4086	0.0100	2.4696	0.0119	0.0107	0.5	0.5
120	1200	0.0040	0.0120	2.7120	1.4187	0.0100	2.4816	0.0119	0.0107	0.5	0.5
121	1210	0.0040	0.0120	2.7240	1.4287	0.0100	2.4935	0.0119	0.0107	0.5	0.5
122	1220	0.0040	0.0120	2.7360	1.4387	0.0100	2.5055	0.0119	0.0107	0.5	0.5
123	1230	0.0040	0.0120	2.7480	1.4488	0.0101	2.5174	0.0119	0.0108	0.5	0.5
124	1240	0.0040	0.0120	2.7600	1.4589	0.0101	2.5293	0.0119	0.0108	0.5	0.5
125	1250	0.0040	0.0120	2.7720	1.4689	0.0101	2.5413	0.0119	0.0108	0.5	0.5
126	1260	0.0040	0.0120	2.7840	1.4790	0.0101	2.5532	0.0119	0.0108	0.5	0.5
127	1270	0.0040	0.0120	2.7960	1.4891	0.0101	2.5652	0.0119	0.0108	0.5	0.5
128	1280	0.0040	0.0120	2.8080	1.4992	0.0101	2.5771	0.0119	0.0108	0.5	0.5
129	1290	0.0040	0.0120	2.8200	1.5094	0.0101	2.5891	0.0119	0.0108	0.5	0.5
130	1300	0.0040	0.0120	2.8320	1.5195	0.0101	2.6010	0.0119	0.0108	0.5	0.5
131	1310	0.0040	0.0120	2.8440	1.5297	0.0101	2.6130	0.0119	0.0108	0.5	0.5
132	1320	0.0040	0.0120	2.8560	1.5398	0.0102	2.6249	0.0119	0.0108	0.5	0.5
133	1330	0.0040	0.0120	2.8680	1.5500	0.0102	2.6368	0.0119	0.0108	0.5	0.5
134	1340	0.0040	0.0120	2.8800	1.5601	0.0102	2.6488	0.0119	0.0108	0.5	0.5
135	1350	0.0040	0.0120	2.8920	1.5703	0.0102	2.6607	0.0119	0.0108	0.5	0.5
136	1360	0.0040	0.0120	2.9040	1.5805	0.0102	2.6727	0.0119	0.0108	0.5	0.5
137	1370	0.0040	0.0120	2.9160	1.5907	0.0102	2.6846	0.0119	0.0108	0.5	0.5
138	1380	0.0040	0.0120	2.9280	1.6010	0.0102	2.6966	0.0119	0.0109	0.5	0.5
139	1390	0.0040	0.0120	2.9400	1.6112	0.0102	2.7085	0.0119	0.0109	0.5	0.5
140	1400	0.0040	0.0120	2.9520	1.6214	0.0102	2.7205	0.0119	0.0109	0.5	0.5
141	1410	0.0040	0.0120	2.9640	1.6317	0.0102	2.7324	0.0119	0.0109	0.5	0.5

(1) Time Incre- ment	(2) Time (Min)	(3) Rainfall Distri- bution (% of Pt)	(4) Incre- mental Rainfall (in)	(5) Accumu- lated Rainfall (in)	(6) Accumu- lated Runoff (in)	(7) Incre- mental Runoff (in)	(8) Accumu- lated Runoff (in)	(9) Incre- mental Runoff (in)	(10) Total Runoff (in)	(11) Instant Hydro- graph (cfs)	(12) Design Hydro- graph (cfs)	
142	1420	0.0040	0.0120	2.9760	1.6419	0.0103	2.7444	0.0119	0.0109	0.5	0.5	
143	1430	0.0040	0.0120	2.9880	1.6522	0.0103	2.7563	0.0119	0.0109	0.5	0.5	
144	1440	0.0040	0.0120	3.0000	1.6625	0.0103	2.7683	0.0119	0.0109	0.5	0.5	
Total		1.0000	3.0000							Hydrograph Volume	58603	
								(Cubic Feet)				



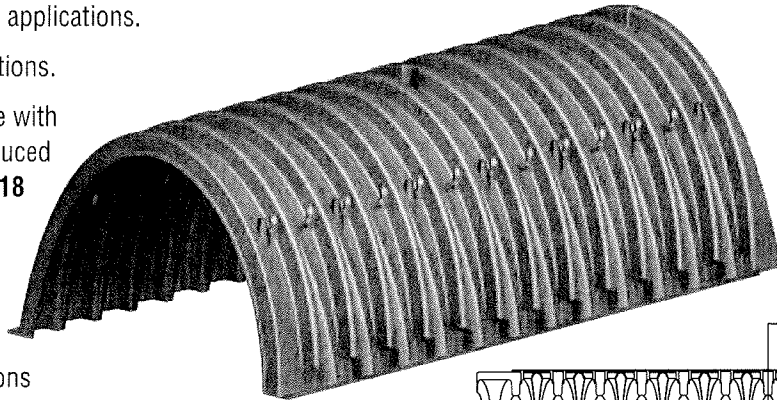


StormTech DC-780 Chamber

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots thus maximizing land usage for commercial and municipal applications.



- 12' Deep Cover applications.
- Designed in accordance with **ASTM F 2787** and produced to meet the **ASTM F 2418** product standard.
- **AASHTO** safety factors provided for AASHTO Design Truck (H20) and deep cover conditions



StormTech DC-780 Chamber (not to scale)

Nominal Chamber Specifications

Size (L x W x H)
85.4" x 51.0" x 30.0"
(2169 x 1295 x 762 mm)

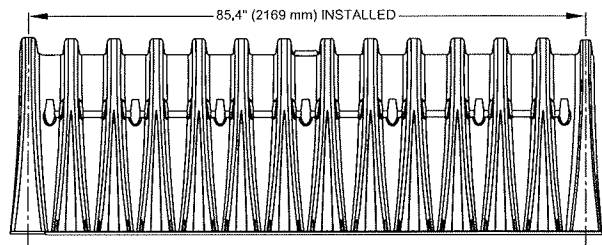
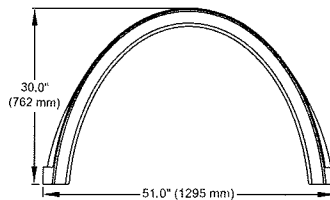
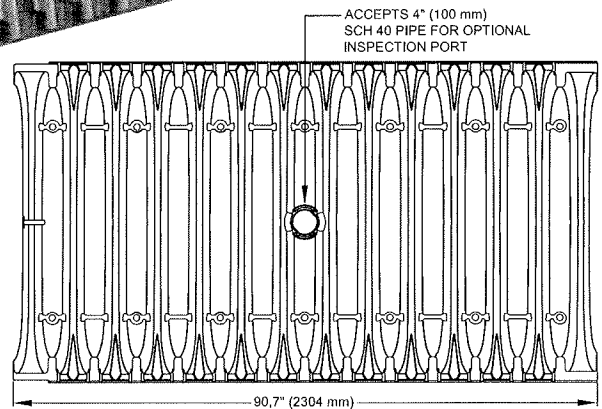
Chamber Storage
46.2 ft³ (1.3 m³)

Minimum Installed Storage*
78.4 ft³ (2.2 m³)

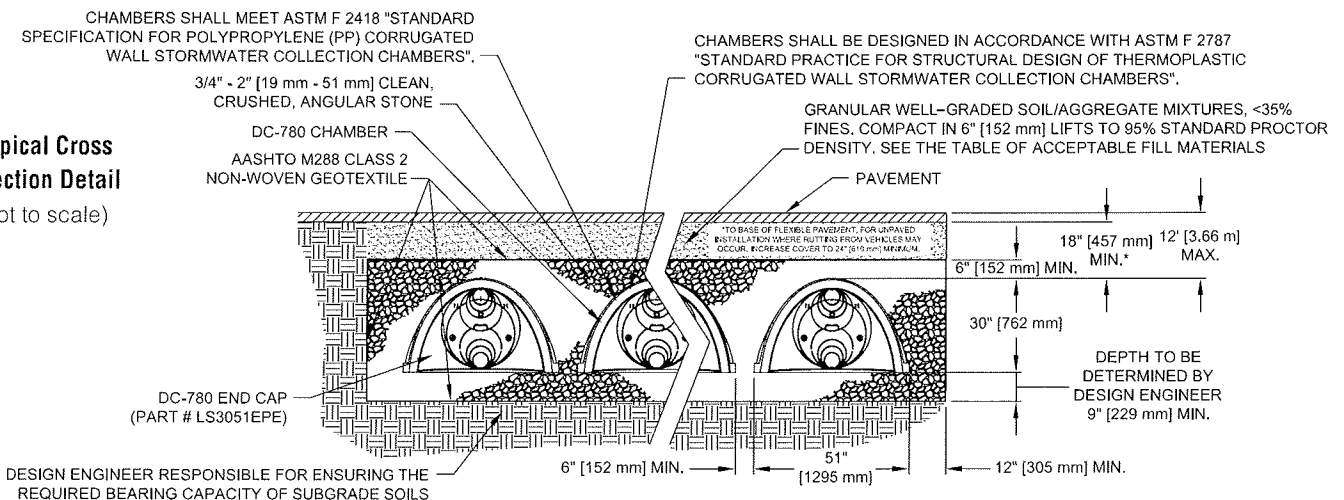
Shipping

24 chambers/pallet
60 end caps/pallet
12 pallets/truck

* Assumes 9" (229 mm) stone below, 6" (152 mm) stone above, 6" (152 mm) row spacing and 40% stone porosity.



Typical Cross Section Detail (not to scale)



THIS CROSS SECTION DETAILS THE REQUIREMENTS NECESSARY TO SATISFY THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 12.12 FOR EARTH AND LIVE LOADS USING STORMTECH CHAMBERS

DC-780 Cumulative Storage Volumes Per Chamber

Assumes 40% Stone Porosity. Calculations are Based Upon a 9" (229 mm) Stone Base Under the Chambers.

Depth of Water in System Inches (mm)	Cumulative Chamber Storage ft³ (m³)	Total System Cumulative Storage ft³ (m³)
45 (1143)	46.27 (1.310)	78.47 (2.222)
44 (1118)	46.27 (1.310)	77.34 (2.190)
43 (1092)	Stone 46.27 (1.310)	76.21 (2.158)
42 (1067)	Cover 46.27 (1.310)	75.09 (2.126)
41 (1041)	46.27 (1.310)	73.96 (2.094)
40 (1016)	46.27 (1.310)	72.83 (2.062)
39 (991)	46.27 (1.310)	71.71 (2.030)
38 (965)	46.21 (1.309)	70.54 (1.998)
37 (940)	46.04 (1.304)	69.32 (1.963)
36 (914)	45.76 (1.296)	68.02 (1.926)
35 (889)	45.15 (1.278)	66.53 (1.884)
34 (864)	44.34 (1.255)	64.91 (1.838)
33 (838)	43.38 (1.228)	63.21 (1.790)
32 (813)	42.29 (1.198)	61.43 (1.740)
31 (787)	41.11 (1.164)	59.59 (1.688)
30 (762)	39.83 (1.128)	57.70 (1.634)
29 (737)	38.47 (1.089)	55.76 (1.579)
28 (711)	37.01 (1.048)	53.76 (1.522)
27 (686)	35.49 (1.005)	51.72 (1.464)
26 (660)	33.90 (0.960)	49.63 (1.405)
25 (635)	32.24 (0.913)	47.52 (1.346)
24 (610)	30.54 (0.865)	45.36 (1.285)
23 (584)	28.77 (0.815)	43.18 (1.223)
22 (559)	26.96 (0.763)	40.97 (1.160)
21 (533)	25.10 (0.711)	38.72 (1.096)
20 (508)	23.19 (0.657)	36.45 (1.032)
19 (483)	21.25 (0.602)	34.16 (0.967)
18 (457)	19.26 (0.545)	31.84 (0.902)
17 (432)	17.24 (0.488)	29.50 (0.835)
16 (406)	15.19 (0.430)	27.14 (0.769)
15 (381)	13.10 (0.371)	24.76 (0.701)
14 (356)	10.98 (0.311)	22.36 (0.633)
13 (330)	8.83 (0.250)	19.95 (0.565)
12 (305)	6.66 (0.189)	17.52 (0.496)

DC-780 Cumulative Storage Volumes Per Chamber (cont.)

Depth of Water in System Inches (mm)	Cumulative Chamber Storage ft³ (m³)	Total System Cumulative Storage ft³ (m³)
11 (279)	4.46 (0.126)	15.07 (0.427)
10 (254)	2.24 (0.064)	12.61 (0.357)
9 (229)	0	10.14 (0.287)
8 (203)	0	9.01 (0.255)
7 (178)	Stone 0	7.89 (0.223)
6 (152)	Foundation 0	6.76 (0.191)
5 (127)	0	5.63 (0.160)
4 (102)	0	4.51 (0.128)
3 (76)	0	3.38 (0.096)
2 (51)	0	2.25 (0.064)
1 (25)	0	1.13 (0.032)

Note: Add 1.13 cu. ft. (0.032 m³) of storage for each additional inch (25 mm) of stone foundation.

Storage Volume Per Chamber ft³ (m³)

	Bare Chamber Storage ft³ (m³)	Chamber and Stone Volume- Stone Foundation Depth		
		9" (229 mm)	12" (305 mm)	18" (457 mm)
StormTech DC-780	46.2 (1.3)	78.4 (2.2)	81.8 (2.3)	88.6 (2.5)

Note: Assumes 40% porosity for the stone, the bare chamber volume, 6" (152 mm) stone above, and 6" (152 mm) row spacing.

Amount of Stone Per Chamber

	Stone Foundation Depth		
	9"	12"	18"
ENGLISH TONS (CUBIC YARDS)			
StormTech DC-780	4.2 (3.0 yd³)	4.7 (3.3 yd³)	5.6 (3.9 yd³)
METRIC KILOGRAMS (METER³)			
StormTech DC-780	3810 (2.3 m³)	4264 (2.5 m³)	5080 (3.0 m³)

Note: Assumes 6" (152 mm) of stone above, and between chambers.

Volume of Excavation Per Chamber yd³ (m³)

	Stone Foundation Depth		
	9" (229 mm)	12" (305 mm)	18" (457 mm)
StormTech DC-780	5.9 (4.5)	6.3 (4.8)	6.9 (5.3)

Note: Assumes 6" (152 mm) of separation between chamber rows and 18" (457 mm) of cover. The volume of excavation will vary as the depth of the cover increases.

Cover Ht. ft. (m)	Minimum Required Bearing Resistance for Service Loads ksf (kPa)																					
	4.1 (196)	4.0 (192)	3.9 (187)	3.8 (182)	3.7 (177)	3.6 (172)	3.5 (168)	3.4 (163)	3.3 (158)	3.2 (153)	3.1 (148)	3.0 (144)	2.9 (139)	2.8 (134)	2.7 (129)	2.6 (124)	2.5 (120)	2.4 (115)	2.3 (110)	2.2 (105)	2.1 (101)	2.0 (96)
8.5 (2.59)	9 (229)	9 (229)	9 (229)	9 (229)	9 (229)	9 (229)	12 (305)	12 (305)	12 (305)	12 (305)	12 (305)	15 (381)	15 (381)	15 (381)	18 (457)	18 (457)	18 (457)	21 (533)	24 (610)	24 (610)	27 (686)	30 (762)
9.0 (2.74)	9 (229)	9 (229)	9 (229)	9 (229)	9 (229)	12 (305)	12 (305)	12 (305)	12 (305)	12 (305)	15 (381)	15 (381)	15 (381)	18 (457)	18 (457)	18 (457)	21 (533)	24 (610)	24 (610)	27 (686)	30 (762)	33 (838)
9.5 (2.90)	9 (229)	9 (229)	9 (229)	9 (229)	12 (305)	12 (305)	12 (305)	12 (305)	12 (305)	15 (381)	15 (381)	15 (381)	18 (457)	18 (457)	18 (457)	21 (533)	24 (610)	24 (610)	27 (686)	30 (762)	33 (838)	36 (915)
10.0 (3.05)	9 (229)	9 (229)	12 (305)	12 (305)	12 (305)	12 (305)	15 (381)	15 (381)	15 (381)	15 (381)	18 (457)	18 (457)	18 (457)	21 (533)	21 (533)	24 (610)	24 (610)	27 (686)	30 (762)	30 (762)	33 (838)	36 (915)
10.5 (3.20)	9 (229)	12 (305)	12 (305)	12 (305)	12 (305)	15 (381)	15 (381)	15 (381)	15 (381)	18 (457)	18 (457)	18 (457)	21 (533)	21 (533)	24 (610)	24 (610)	27 (686)	30 (762)	30 (762)	33 (838)	36 (915)	39 (991)
11.0 (3.35)	12 (305)	12 (305)	12 (305)	12 (305)	15 (381)	15 (381)	15 (381)	15 (381)	18 (457)	18 (457)	18 (457)	21 (533)	21 (533)	24 (610)	24 (610)	27 (686)	30 (762)	30 (762)	33 (838)	36 (915)	39 (991)	42 (1067)
11.5 (3.50)	12 (305)	12 (305)	12 (305)	15 (381)	15 (381)	15 (381)	18 (457)	18 (457)	18 (457)	21 (533)	21 (533)	24 (610)	24 (610)	27 (686)	27 (686)	30 (762)	30 (762)	33 (838)	36 (915)	39 (991)	42 (1067)	45 (1243)
12.0 (3.66)	12 (305)	12 (305)	15 (381)	15 (381)	15 (381)	18 (457)	18 (457)	18 (457)	21 (533)	21 (533)	24 (610)	24 (610)	27 (686)	27 (686)	30 (762)	30 (762)	33 (838)	36 (915)	39 (991)	42 (1067)	45 (1243)	48 (1371)

NOTE: The design engineer is solely responsible for assessing the bearing resistance (allowable bearing capacity) of the subgrade soils and determining the depth of foundation stone. Subgrade bearing resistance should be assessed with consideration for the range of soil moisture conditions expected under a stormwater system.

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January 2013

GENERAL USE LEVEL DESIGNATION FOR BASIC TREATMENT

For

Royal Environmental Systems, Inc. ecoStorm/ecoStorm *plus* Treatment Train

Ecology's Decision:

1. Based on Royal Environmental's application submissions, including the Final Technical Evaluation Report (TER) dated July 2012, and recommendations by the Board of External Reviewers (BER), Ecology hereby issues a general use level designation (GULD) for the ecoStorm/ecoStorm *plus* treatment train:
 - As a basic stormwater treatment device for total suspended solids (TSS) removal,
 - Using the Standard concrete filter for the ecoStorm *plus*,
 - As part of a treatment train that includes an upstream ecoStorm unit.
2. Ecology approves the ecoStorm/ecoStorm *plus* treatment train units using the Standard concrete filter for treatment at the water quality design flow rate per filter listed below. The water quality design flow rates are calculated using the following procedures:
 - Western Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using the latest version of the Western Washington Hydrology Model or other Ecology-approved continuous runoff model.
 - Eastern Washington: For treatment installed upstream of detention or retention, the water quality design flow rate is the peak 15-minute flow rate as calculated using one of the three methods described in Chapter 2.2.5 of the Stormwater Management Manual for Eastern Washington (SWMMEW) or local manual.
 - Entire State: For treatment installed downstream of detention, the water quality design flow rate is the full 2-year release rate of the detention facility.
3. This designation has no expiration date, but Ecology may amend or revoke it, and it is subject to the conditions specified below.

Ecology's Conditions of Use:

1. The ecoStorm component of the treatment train shall comply with the following conditions:

- **Design, assemble, install, operate, and maintain the ecoStorm units in accordance with Royal Environmental Systems Inc.'s applicable manuals and documents and the Ecology Decision.**
- **Owners must install appropriately sized ecoStorm unit or units upstream of the ecoStorm plus unit(s).**
- **ecoStorm units range from 4 to 12 feet in diameter with a design treatment flow of 30 GPM (0.067 cfs) per sf. See table below.**

ecoStorm Model Number	Diameter (feet)	Surface Area (sf)	Treatment Flow Rate (gpm)	Maximum number of ecoStorm <i>plus</i> units ^a
0.5	4	12.57	377	2
0.75	5	19.63	588	3
1	6	28.27	848	4
1.5	7	38.48	1,153	6
2	8	50.27	1,508	8
3	10	78.54	2,356	13
4	12	113.1	3,393	18

sf: square feet

gpm: gallons per minute

^a Calculated as ecoStorm flow rate/ecoStorm *plus* design flow (0.40 cfs). Can also be calculated using a surface area ratio of 0.7 ecoStorm/ecoStorm *plus*.

2. The ecoStorm plus component of the treatment train shall comply with the following conditions:

- **Design, assemble, install, operate, and maintain ecoStorm plus units in accordance with Royal Environmental Systems Inc.'s applicable manuals and documents and the Ecology Decision.**
 - **Size the ecoStorm *plus* units at a design rate of 180 gallons per minute (0.40 cfs) per 5-ft. diameter filter (19.63 square feet surface area).**
- 3. Operators must lower Effluent pH from the ecoStorm plus unit if necessary to meet water quality standards using passive pH adjustment with ascorbic acid tablets or sodium bisulfate or by installing a CO2 sparging system or other equivalent method.**
- 4. Replacement ecoStorm plus filters shall be available for installation within 3 days after identifying that the filters need replacement.**

The following conditions apply to the combined treatment system (ecoStorm/ecoStorm *plus* treatment train):

- 1. To determine site-specific maintenance schedules for installed ecoStorm/ecoStorm *plus* treatment trains, the presence and frequency of all system bypasses shall be monitored by a water sensor (presence/absence or level) and logging device.**
- 2. The required maintenance interval for stormwater treatment devices is often dependent upon the degree of pollutant loading from a particular drainage basin. Therefore, Ecology does not endorse or recommend a “one size fits all” maintenance cycle for a particular model/size of manufactured treatment device.**
 - Testing results provided to Ecology for the Basic Treatment GULD approval indicate that the treatment system required backflushing on average every 1.3 months and filter replacement after 9.3 months on average at the specific test installation. Indicators of the need for maintenance included:**
 - Decreased flow through filter**
 - Increased incidence of bypass**
 - Visual build-up of material on surface of filter**
 - This particular maintenance interval does not necessarily determine the overall maintenance frequency for all ecoStorm/ecoStorm *plus* treatment trains.**
 - Owners/operators must inspect ecoStorm/ecoStorm *plus* treatment trains systems for a minimum of twelve months from the start of post-construction operation to determine site-specific maintenance schedules and requirements. Inspection frequency shall be as stated below. After the first year of operation, owners/operators must conduct inspections based on the findings during the first year of inspections.**
 - Conduct inspections by qualified personnel pursuant to manufacturer’s guidelines, and use methods capable of determining either a decrease in treated effluent flowrate and/or a decrease in pollutant removal ability.**
- 3. Records of maintenance, bypass flows, and local rain gage data shall be submitted to Ecology on a quarterly basis until site-specific maintenance schedules for the installed ecoStorm/ecoStorm *plus* treatment train can be determined. Bypass data must be downloaded at least monthly to evaluate system performance relative to the goal of treating 91 percent of the average annual runoff volume.**
- 4. Owners of ecoStorm/ecoStorm *plus* treatment trains shall submit a letter to Ecology committing to a schedule of required maintenance inspections as follows:**
 - From October 1st to April 30th: inspections shall occur once every two weeks or after every 2 inches of rainfall, whichever occurs first.**

- **From May 1st to September 30th inspections shall occur at least monthly and/or in conjunction with a storm event of > 0.5 inches in 24 hours.**
- 5. Discharges from the ecoStorm/ecoStorm *plus* treatment train shall not cause or contribute to water quality standards violations in receiving waters.**

Applicant: Royal Environmental Systems Inc.

Applicant's Address: 30622 Forest Blvd, PO Box 430
Stacy, MN, 55079

Application Documents:

- Draft ecoStorm/ecoStorm *plus* Treatment Train Evaluation Technical Evaluation Report, Herrera Environmental Consultants (October 2011)
- Final ecoStorm/ecoStorm *plus* Treatment Train Evaluation Technical Evaluation Report, Herrera Environmental Consultants (August 2012)
- Responses to BER comments, Water Tectonics and Herrera Environmental Consultants (August 2012)
- ecoStorm *plus* CULD Request: Supplemental information/clarification as requested in Ecology's December 21, 2010 letter and use level designation extension request. Memorandum prepared by WaterTectonics (January 19, 2011).
- Request for Conditional Use Level Designation for the ecoStorm *plus*TM unit, memorandum prepared by Royal Environmental Systems, Inc. (October 21, 2010).
 - a. ecoStorm *plus*TM Product Information for Washington State Department of Ecology Use Designation Determination (September 29, 2010)
 - b. Herrera Environmental Consultants Memorandum – Update on Water Tectonics TAPE process for the ecoStorm *plus* filter system (September 8, 2010)
 - c. Water Tectonics, Inc. – Internal Memorandum McRedmond ecoStorm *plus* Data Collection, (October 5, 2010)
 - d. Herrera Environmental Consultants – McRedmond TSS Discrete Analysis (2010 Data)
 - e. Herrera Environmental Consultants – McRedmond TSS Composite Analysis (2010 Data)
 - f. Herrera Environmental Consultants – Third Party Technical Review City of Redmond ecoStorm *plus* Monitoring Project, January 8, 2010 (2009 Data)
- QAPP ecoStorm *plus*TM McRedmond RWQF – Addendum 4 (March 1, 2010)
- QAPP ecoStorm *plus*TM McRedmond RWQF – Addendum 3 (September 1, 2009)
- QAPP ecoStorm *plus*TM McRedmond RWQF – Addendum 2 (August 1, 2009)
- QAPP ecoStorm *plus*TM McRedmond RWQF – Addendum 1 (April 8, 2009)

- Quality Assurance Project Plan (QAPP) *ecoStorm plus*TM McRedmond Regional Water Quality Facility (RWQF), prepared by Water Tectonics and Royal Environmental Systems, Inc. (March 18, 2008)
- *ecoStorm plus*TM Quality Assurance Project Plan (QAPP) for Basic, Enhanced & Phosphorus Treatment (Rev04), prepared by Water Tectonics and Royal Environmental Systems, Inc. (August, 28, 2007)
- Product Information for Washington State Department of Ecology Use Designation Determination, prepared by Water Tectonics (July 2006)
- *ecoStorm plus* Lab Scale Testing Final Report, prepared by Water Tectonics (July 2006)
- Report on investigations into retention of pollutants in rainfall runoff from a concrete plant using a *ecoStorm plus* filter pit prepared by: Dr. Dierkes (August 2004)

Applicant's Use Level Request:

General Use Level Designation as a Basic Treatment device.

Applicant's Performance Claims:

- Average of 80% removal of TSS.

Findings of Fact:

1. Monitoring for this project occurred at the McRedmond Regional Water Quality Facility (McRedmond Facility) installed in 2007 at the Luke McRedmond Park in Redmond, Washington.
2. WaterTectonics collected water quality data from 31 storm events (15 composite sampling events and 16 discrete sampling events) over a 27-month period (March 2009 through June 2011).
3. WaterTectonics collected a total of 15 valid TSS composite samples: 10 samples were in the 20 to 99 mg/L influent TSS range, 3 samples were in the 100 to 200 mg/L influent TSS range, and 2 samples were in the > 200 mg/L TSS range. Since a majority of the samples were in the 20 to less than 100 mg/L influent range, this was the only performance goal statistically evaluated.
4. To evaluate this goal, WaterTectonics computed a bootstrapped estimate of the upper 95 percent confidence limit around the mean from the 10 valid samples in the 20 to less than 100 mg/L influent TSS range; they compared this value (9.7 mg/L) to the 20 mg/L effluent goal. Because the upper confidence limit is lower than the effluent goal of 20 mg/L, it can be concluded that the *ecoStorm/ecoStorm plus* treatment train met the basic treatment goal with a confidence level of 95 percent.
5. Although there were not enough samples in the other two size ranges to demonstrate statistical significance, the mean TSS percent removal was 84 percent in the 100 to 200 mg/L influent TSS range and 85 percent in the > 200 mg/L TSS range.

6. In order to evaluate pollutant removal performance as a function of flow rate, WaterTectonics performed a regression analysis using pooled effluent TSS concentration data from composite and discrete samples collected from the ecoStorm/ecoStorm *plus* treatment train. Aliquot-weighted flow rates for the composite sampling ranged from 39.3 to 318 gpm. Instantaneous flow rates for the discrete sampling ranged from 12.3 to 257 gpm. This analysis showed there was no significant relationship between flow rate and effluent TSS concentrations, demonstrating that the measured pollutant removal performance can be applied to the range of flow rates monitored during this study (12.3 to 318 gpm).
7. WaterTectonics evaluated data from the continuous pH record to determine if there were differences in average daily pH influent and effluent values before and after initiation of CO₂ sparging. The average daily influent pH value was 6.85 before and after sparging. However, the average daily effluent pH value was reduced from 9.25 before CO₂ sparging to 8.01 after CO₂ sparging.

Other ecoStorm/ecoStorm *plus* Treatment Train Related Issues to be Addressed By the Company:

1. Develop easy-to-implement methods of determining when an ecoStorm/ecoStorm *plus* treatment train requires maintenance (cleaning and filter replacement).

Technology Description: Download at www.royalenterprises.net

Contact Information:

Applicant: Liisa Doty
 WaterTectonics, Inc.
 6300 Merrill Creek Parkway
 Suite C-100
 Everett, WA, 98203
 425-349-4200
Liisa@watertectonics.com

Applicant website: www.royalenterprises.net
 Ecology web link: <http://www.ecy.wa.gov/programs/wq/stormwater/newtech/index.html>
 Ecology: Douglas C. Howie, P.E.
 Department of Ecology
 Water Quality Program
 (360) 407-6444
douglas.howie@ecy.wa.gov

Revision History

Date	Revision
December 2009	PULD granted
February 2011	CULD granted
July 2012	GULD granted for Basic Treatment, added Revision Table
January 2013	Modified Design Storm Description, revised format to match Ecology standard



United States
Department of
Agriculture

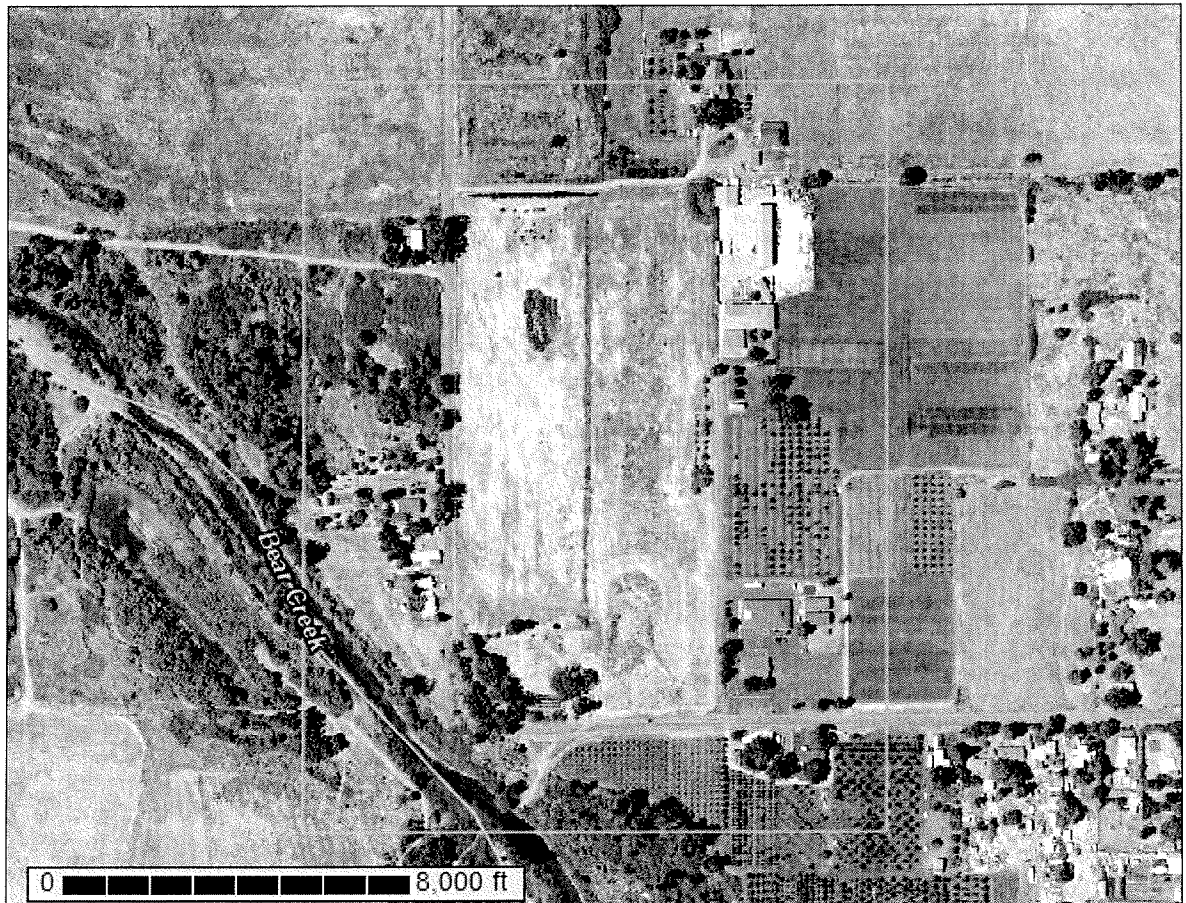
NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for Jackson County Area, Oregon, Parts of Jackson and Klamath Counties

White Hawk



August 22, 2014

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<http://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

Custom Soil Resource Report

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

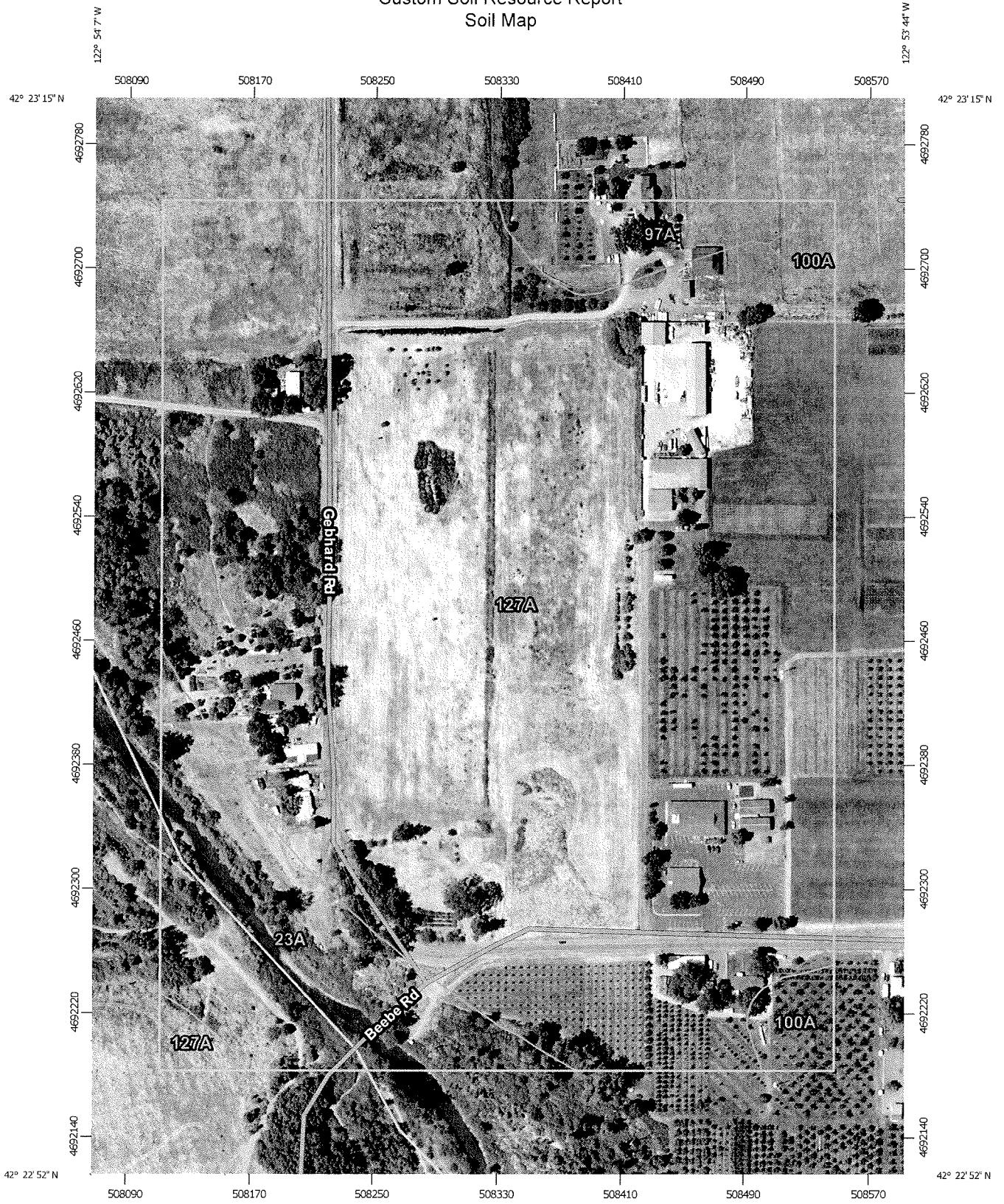
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

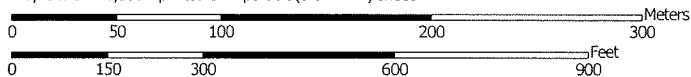
Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



Map Scale: 1:3,380 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

- Area of Interest (AOI)**
 - Area of Interest (AOI)
- Soils**
 - Soil Map Unit Polygons
 - Soil Map Unit Lines
 - Soil Map Unit Points
- Special Point Features**
 - Blowout
 - Borrow Pit
 - Clay Spot
 - Closed Depression
 - Gravel Pit
 - Gravelly Spot
 - Landfill
 - Lava Flow
 - Marsh or swamp
 - Mine or Quarry
 - Miscellaneous Water
 - Perennial Water
 - Rock Outcrop
 - Saline Spot
 - Sandy Spot
 - Severely Eroded Spot
 - Sinkhole
 - Slide or Slip
 - Sodic Spot
- Water Features**
 - Streams and Canals
- Transportation**
 - Rails
 - Interstate Highways
 - US Routes
 - Major Roads
 - Local Roads
- Background**
 - Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL: <http://websoilsurvey.nrcs.usda.gov>
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Jackson County Area, Oregon, Parts of Jackson and Klamath Counties
 Survey Area Data: Version 10, Dec 4, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 28, 2010—Jul 17, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor-shifting of map unit boundaries may be evident.

Map Unit Legend

Jackson County Area, Oregon, Parts of Jackson and Klamath Counties (OR632)			
Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
23A	Camas-Newberg-Evans complex, 0 to 3 percent slopes	6.7	11.1%
97A	Kerby loam, 0 to 3 percent slopes	2.1	3.4%
100A	Kubli loam, 0 to 3 percent slopes	1.1	1.8%
127A	Medford silty clay loam, 0 to 3 percent slopes	50.8	83.7%
Totals for Area of Interest		60.7	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that

Custom Soil Resource Report

have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Jackson County Area, Oregon, Parts of Jackson and Klamath Counties

23A—Camas-Newberg-Evans complex, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: hrrs
Elevation: 1,000 to 3,000 feet
Mean annual precipitation: 18 to 40 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 140 to 180 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Camas and similar soils: 40 percent
Newberg and similar soils: 30 percent
Evans and similar soils: 19 percent
Minor components: 4 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Camas

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Gravelly alluvium

Typical profile

H1 - 0 to 10 inches: gravelly sandy loam
H2 - 10 to 60 inches: extremely gravelly coarse sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 9 to 17 inches to strongly contrasting textural stratification
Natural drainage class: Excessively drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Available water storage in profile: Very low (about 0.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: A
Ecological site: Loamy flood plain 18-30 pz (R005XY028OR)

Description of Newberg

Setting

Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

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Parent material: Alluvium

Typical profile

H1 - 0 to 17 inches: fine sandy loam

H2 - 17 to 30 inches: sandy loam

H3 - 30 to 60 inches: loamy sand

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Occasional

Frequency of ponding: None

Available water storage in profile: Moderate (about 7.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: A

Ecological site: Loamy flood plain 18-30 pz (R005XY028OR)

Description of Evans

Setting

Landform: Flood plains

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Recent alluvium

Typical profile

H1 - 0 to 38 inches: loam

H2 - 38 to 60 inches: loam

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Well drained

Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)

Depth to water table: More than 80 inches

Frequency of flooding: Occasional

Frequency of ponding: None

Available water storage in profile: High (about 10.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 3w

Hydrologic Soil Group: B

Ecological site: Loamy flood plain 18-30 pz (R005XY028OR)

Minor Components

Aqualls

Percent of map unit: 2 percent

Landform: Flood plains

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Cove

Percent of map unit: 1 percent
Landform: Flood plains
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Poorly drained bottom (R005XY016OR)

Riverwash

Percent of map unit: 1 percent
Landform: Flood plains

97A—Kerby loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: hrw8
Elevation: 1,000 to 2,000 feet
Mean annual precipitation: 18 to 35 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 140 to 180 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Kerby and similar soils: 80 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kerby

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

H1 - 0 to 7 inches: loam
H2 - 7 to 54 inches: loam
H3 - 54 to 60 inches: very gravelly sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.20 to 1.98 in/hr)
Depth to water table: More than 80 inches

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Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: B
Ecological site: Deep loamy terrace 18-28 pz (R005XY036OR)

Minor Components

Gregory

Percent of map unit: 4 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Poorly drained bottom (R005XY016OR)

Aquepts

Percent of map unit: 1 percent
Landform: Terraces

100A—Kubli loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: hrlv
Elevation: 1,000 to 2,300 feet
Mean annual precipitation: 18 to 30 inches
Mean annual air temperature: 50 to 54 degrees F
Frost-free period: 150 to 180 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Kubli and similar soils: 90 percent
Minor components: 3 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kubli

Setting

Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 15 inches: loam
H2 - 15 to 31 inches: loam

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H3 - 31 to 60 inches: clay

Properties and qualities

Slope: 0 to 3 percent

Depth to restrictive feature: More than 80 inches

Natural drainage class: Somewhat poorly drained

Capacity of the most limiting layer to transmit water (Ksat): Very low to moderately low (0.00 to 0.06 in/hr)

Depth to water table: About 6 to 36 inches

Frequency of flooding: None

Frequency of ponding: None

Available water storage in profile: High (about 9.6 inches)

Interpretive groups

Land capability classification (irrigated): 3w

Land capability classification (nonirrigated): 4w

Hydrologic Soil Group: D

Ecological site: Deep loamy terrace 18-28 pz (R005XY036OR)

Minor Components

Aquolls

Percent of map unit: 2 percent

Landform: Terraces

Gregory

Percent of map unit: 1 percent

Landform: Stream terraces

Landform position (three-dimensional): Tread

Down-slope shape: Linear

Across-slope shape: Linear

Ecological site: Poorly drained bottom (R005XY016OR)

127A—Medford silty clay loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: hrn5

Elevation: 1,000 to 4,000 feet

Mean annual precipitation: 18 to 35 inches

Mean annual air temperature: 50 to 54 degrees F

Frost-free period: 125 to 180 days

Farmland classification: All areas are prime farmland

Map Unit Composition

Medford and similar soils: 85 percent

Minor components: 3 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

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Description of Medford

Setting

Landform: Stream terraces, alluvial fans
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from metavolcanics and/or metasedimentary rock

Typical profile

H1 - 0 to 12 inches: silty clay loam
H2 - 12 to 22 inches: silty clay
H3 - 22 to 53 inches: silty clay loam
H4 - 53 to 71 inches: stratified sandy clay loam to silty clay loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 48 to 72 inches
Frequency of flooding: None
Frequency of ponding: None
Available water storage in profile: High (about 9.7 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: C
Ecological site: Deep loamy terrace 18-28 pz (R005XY036OR)

Minor Components

Gregory

Percent of map unit: 2 percent
Landform: Stream terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Poorly drained bottom (R005XY016OR)

Aquolls

Percent of map unit: 1 percent
Landform: Mountains

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