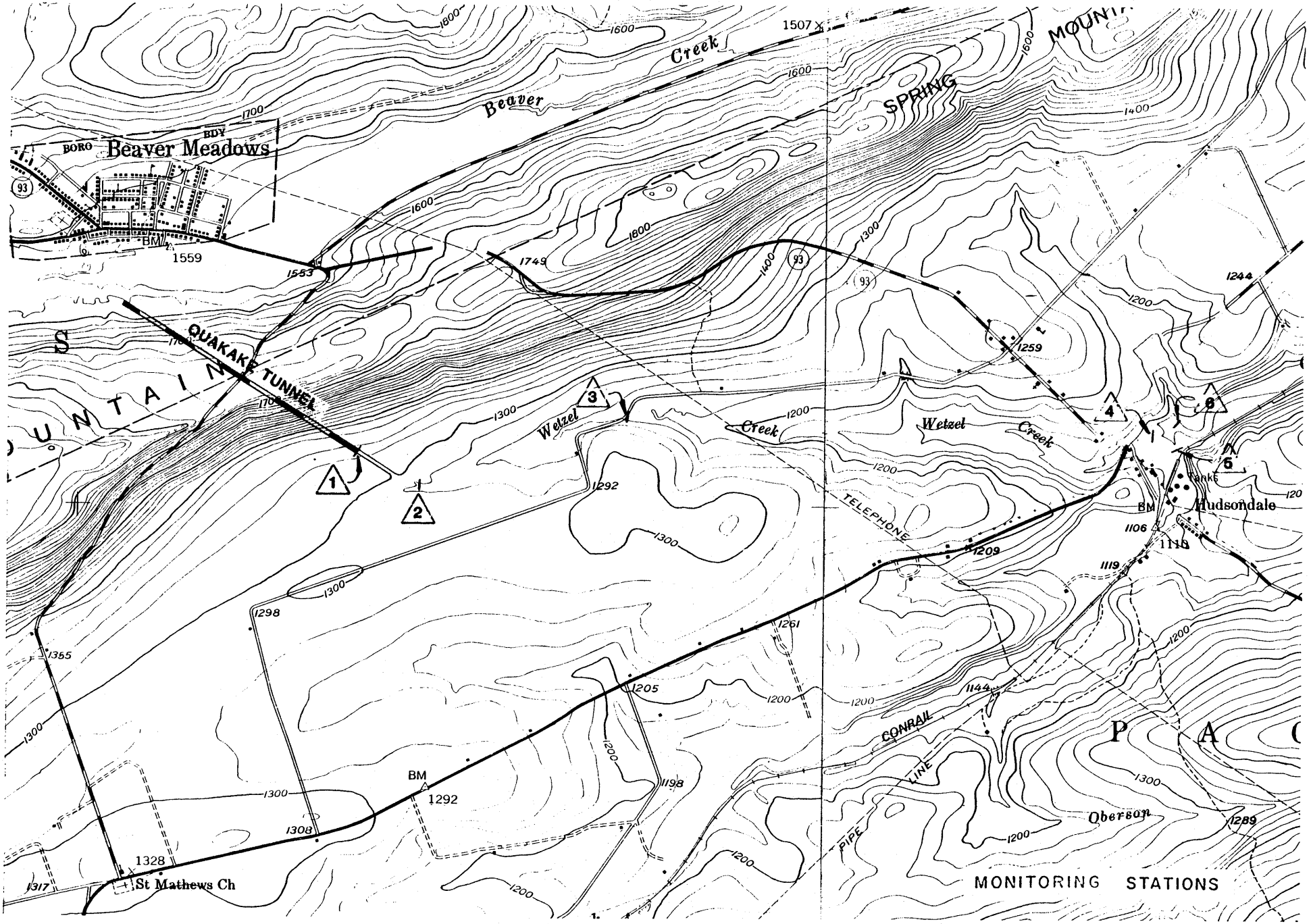
APPENDIX A

1973/74 FIELD INVESTIGATIONS


Beaver Meadows
BORO
BDY
Beaver Creek
SPRING MOUNTAIN
QUAKAKE TUNNEL
Wetzel Creek
Wetzel Creek
TELEPHONE
CONRAIL
PIPE LINE
Oberson
Hudsondale
St Mathews Ch
BM
1559
1292
1328
1507
1553
1749
1259
1244
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1298
1365
1317
1308
1205
1198
1261
1209
1119
1106
1110
1144
1289
1 2 3 4 5 6
MONITORING STATIONS

A1

RECORDS OF MONITORING STATIONS 1973/74

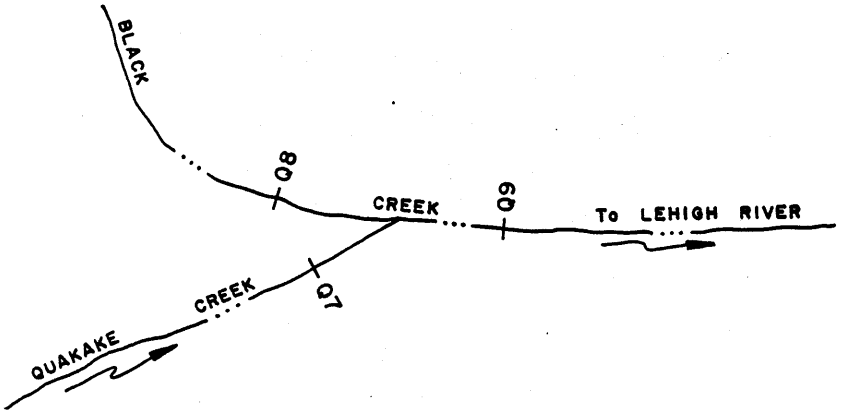
MONITORING STATION	FIELD DATA					LABORATORY TEST RESULTS																
	SAMPL'G DATE	ELEV. W.S.	FLOW	TEMP	pH	pH	ACIDITY TOTAL	ACIDITY FREE	ALK	SO_4	Fe TOTAL	Fe Fe^{++}	Al	Mg	Mn	Ca	K	Na	Si	Cl^-	SUSPND SOLIDS	TOTAL DISS. SOLIDS
		(1)	MGD	C°																		
Q-1	3-10-73	1297.59	10.0	9	3.55	3.5	170	–	–	270	3.2	0.4	–	–	–	–	–	–	–	–	–	–
	3-26-73	.71	14.3	9	3.60	3.6	130	23	–	200	2.0	0.3	–	20	–	–	–	–	–	–	0	62
	4-12-73	.88	21.7	9	3.85	3.6	100	75	–	180	1.6	0.6	18	17	–	17	–	–	–	–	4	42
	5-1-73	.67	13.2	9	3.80	3.5	140	–	–	260	1.6	0.4	–	–	–	17	–	–	–	–	–	–
	5-17-73	.70	14.0	9	3.81	3.5	120	–	–	200	2.0	0.5	–	–	3	–	–	–	–	–	–	–
	6-1-73	.76	16.3	9	3.78	3.6	130	22	–	150	0.9	0.5	14	19	3	–	–	5	11	15	–	358
	6-19-73	.61	10.8	10	3.61	3.5	150	22	–	250	2.4	0.7	18	24	4	24	2	5	16	–	–	464
	7-3-73	.61	10.8	9	–	3.5	120	–	–	460	2.7	0.5	19	27	4	20	–	–		17	–	446
	7-17-73	.60	10.2	12	3.75	3.3	170	42	–	250	3.3	0.8	20	29	4	23	2	6	10	19	–	540
	8-3-73	.82	18.0	9	3.80	3.4	190	27	–	290	3.6	0.6	24	28	4	24	2	5	13	8	–	516
	8-17-73	.63	11.6	9	3.40	3.3	180	20	–	250	2.9	<.5	21	23	4	21	2	6	12	9	–	486
	9-6-73	.48	6.5	10	3.37	3.4	180	40	–	240	3.7	0.5	21	25	4	24	2	7	11	–	–	432
	9-18-73	.67	13.2	9	3.45	3.5	150	12	–	250	3.3	0.5	18	20	4	18	–	–	–	–	71	538
	10-6-73	.60	10.2	9	3.35	3.1	148	48	–	320	3.2	0	17	20	3	5	1	7	35	–	–	448
	10-18-73	.54	8.4	9	3.20	3.4	172	28	–	224	0.7	0	14	21	3	4	1	7	37	10	–	420
	11-6-73	.68	13.4	8	3.60	3.2	160	4	–	236	1.2	0	21	29	3	3	1	7	–	10	–	366
	11-22-73	.54	8.4	9	3.45	3.4	156	16	–	275	2.7	0	18	26	4	3	1	6	9	10	–	–
	12-11-73	.88	15.1	9	3.69	3.2	130	14	0	225	1.9	0	14	23	2	2	.5	4	2.5	7	–	335
	1-7-74	.82	18.0	8	3.48	3.4	102	8	0	205	1.7	0	9	19	3	16	2	5.4	7	15	0	332
	2-4-74	.85	19.9	6	3.58	3.0	102	16	0	100	1.8	0	6	21	4	1	1	8	4	5	<1	314
	3-20-74	.84	19.5	8	3.55	3.8	138	0	0	150	1.8	0	13	16	3	4	2	8	2	125	3	326
	4-29-74	.76	16.3	11	3.50	3.5	150	40	0	225	2.5	0	13	17	3	2	1	4	14	5	9	374
	5-29-74	1297.73	15.1	10	3.60																	
Q-2a	3-10-73	1282.80	1.12	4	4.80	4.5	7	–	–	10	0.3	0.2										
	3-26-73	.92	1.50	6	4.55	4.6	7	–	–	5	0.2	<0.2										
	4-12-73	.89	1.40	4	4.60	4.3	7	–	–	<2	0.1	<.1										
	5-1-73	.76	1.00	12	4.65	4.1	7	–	–	22	0.4	0.4										
	5-17-73	.80	1.12	12	4.48	5.0	14	–	–	7	0.5	0.5										
	6-1-73	.77	1.02	18	4.55	4.3	9	–	–	5	0.3	0.3										
	6-19-73	.57	0.40	18	4.60	4.6	8	–	–	10	0.8	0.8										
	7-3-73	.57	0.40	18	(2)	4.3	8	–	–	14	0.8	0.8										
	7-17-73	.51	0.19	18	4.40	4.2	12	–	–	5	0.9	0.9										
	8-3-73	.68	0.75	18	4.65	4.0	12	–	–	62	1.2	0.6										
	8-17-73	1282.51	0.19	21	4.40	4.3	12	–	–	10	1.1	0.5										
	9-6-73	–	NO FLOW	–	–	–	–	–	–	–	–	–										
	10-18-73	1282.54	0.31	9	4.40	4.4	20	–	–	–	0.9	-0-										
Q-2b	8-17-73	1.26	0.28	21	4.50	4.4	12	-0-	–	5	1.5	0.7	<1	1	0.2	4	1.1	5	4	10		88
	9-6-73	1.32	0.13	20	4.75	4.4	47	22	–	22	12.0	10.0	2	2	0.1	5	1.2	6	8			264
	10-6-73	1.12	0.67	13	4.20	3.8	20	–	–	25	1.4	-0-										
	11-6-73	1.09	0.78	4	4.60	4.0	14	–	–	25	0.6	-0-										
	11-22-73	1.19	0.43	13	4.45	4.2	6	–	–	20	0.6	-0-										
	12-11-73	0.74	2.35	2	4.50	3.8	12	0	0	25	0.3	-0-	0	8	0.1	2	0.1	4	1.5	12	–	91
	1-7-74	0.90	1.46	8	3.95	4.5	8	0	2	45	0.1	-0-	1	2	0.3	5	<.1	4	0	10	–	50
	2-4-74	NR	NR	2	4.80	4.3	6	0	0	30	0.1	-0-	2	7	0.1	2	14	8	15	–	–	44
Q-3	3-10-73	300.40	13.6	9	3.65	3.5	160	–	–	240	2.9	1.0										
	3-26-73	.58	18.3	9	3.70	3.6	110	–	–	170	1.8	0.8										
	4-12-73	.81	NR	8	3.95	3.7	87	–	–	160	1.4	0.8										
	5-1-73	.46	15.2	11	3.75	3.6	130	–	–	230	2.0	1.0										
	5-17-73	.60	19.1	10	3.72	3.5	110	–	–	180	1.7	0.7										
	6-1-73	.62	19.8	11	3.75	3.6	120	–	–	190	0.8	0.8										
	6-19-73	.43	13.9	11	3.68	3.6	150	–	–	250	2.3	1.2										
	7-3-73	.51	16.2	11	(2)	3.5	110	–	–	220	2.3	0.6										
	7-17-73	.31	11.3	12	3.85	3.4	170	–	–	220	2.7	1.0										
	8-3-73	.51	16.2	14	(2)	3.5	150	–	–	250	3.3	1.1										
	8-17-73	.33	11.8	14	3.62	3.3	150	–	–	240	2.6	0.5										
	9-6-73	.18	7.9	11	3.43	3.4	200	36	–	260	3.1	0.5	21	25	4	24	2	7	11	–	–	488
	10-18-73	.21	8.9	9	3.25	3.5	154	–	–	151	2.5	1.1										
	11-6-73	.38	12.9	8	3.75	3.5	158	–	–	215	1.8	-0-										
	11-22-73	.30	11.2	10	3.40	3.4	140	–	–	230	2.1	-0-										
	12-11-73	.73	24.0	6	3.80	3.3	104	8	0	185	1.6	-0-	10	21	1.4	2	0.5	4	2			340
	1-7-74	300.51	18.2																			

MONITORING STATION	FIELD DATA					LABORATORY TEST RESULTS																
	SAMPL'G DATE	ELEV. W.S. (1)	FLOW MGD	TEMP C°	pH	pH	ACIDITY TOTAL	ACIDITY FREE	ALK	SO_4	Fe TOTAL	Fe $^{++}$	Al	Mg	Mn	Ca	K	Na	Si	Cl^-	SUSPN'D SOLIDS	TOTAL DISS. SOLIDS
Q-4	3-10-73	299.30	12.1	9	3.65	3.5	140	—	—	220	2.3	1.0										
	3-26-73	.52	20.3	9	3.80	3.6	100	—	—	150	1.6	0.8										
	4-12-73	.72	29.4	8	3.95	3.7	89	—	—	130	1.2	0.6										
	6-1-73	.53	20.5	11	3.68	3.6	120	—	—	180	0.9	0.9										
	7-17-73	.32	12.7	13	3.85	3.5	160	—	—	210	2.3	1.0										
	8-17-73	.33	12.9	13	3.55	3.4	160	—	—	240	2.3	<.5										
	9-6-73	.21	8.2	12	3.20	3.4	170	24	—	260	2.7	<.5	19	23	4	23	2	7	11	—		438
	10-18-73	.26	10.3	8	3.25	3.5	148	24	—	199	0.9	0	12	21	2	4	0.6	7	35	10		416
	11-22-73	299.25	10.1	10	3.48	3.5	134	10	—	251	1.8	0	16	25	4	3	1	5	6	10		—
Q-5	3-10-73		13.6	8	6.40	6.1	3	—	-	<2	<.2	0.2	—									
	3-26-73		14.2	8	6.10	6.2	<1	<1	—	5	<.1	0.1	<.1	0.5	—	2.8	—	—	—	—	-0-	66
	4-12-73		12.8	6	6.40	6.1	2	—	—	<2	<.1	0.1	<.1	0.5	—	2.4	—	—	—	—	-0-	60
	6-1-73		8.6	13	6.05	6.2	0	—	1	5	0.2	<.2	<1	2.4	<.1	4.0	—	2.8	—	—	8	41
	7-17-73		9.6	18	6.60	6.1	6	—	—	5	0.3	<.3	<1	4.5	<.1	3.2	1.5	2.8	2	4	—	124
	8-17-73		7.3	20	6.65	5.8	4	—	—	19	0.4	<.4	<1	0.8	<.1	3.6	0.7	2.8	3	7	—	76
	9-6-73		7.9	22	6.40	6.6	-0-	-	—	2	0.3	<.3	<1	0.8	<.1	4.0	0.5	4.0	3	—	—	64
	10-18-73		8.6	9	5.75	6.3	4		20	28	0.1	-0-	-0-	5.6	<.1	2.0	0.3	4.2	14	10	—	47
	11-22-73		8.5	7	5.75	6.2	4		6	6	0.3	-0-	-0-	7.3	<.1	1.3	0.3	2.4	-0-	10	—	—
Q-6	3-10-73	296.58	25.7	8	3.95	3.8	73	—	—	120	1.2	0.6										
	3-26-73	296.94	34.5	9	4.10	4.0	49	-	—	75	0.8	0.4										
	4-12-73	297.18	42.2	6	4.35	4.1	40	—	—	72	0.6	0.5										
	6-1-73	296.71	29.1	12	4.10	3.9	64	-	—	100	0.7	0.7										
	7-17-73	.43	22.3	16	4.20	4.8	70	-	—	98	1.3	0.8										
	8-17-73	.38	21.2	16	3.90	3.6	94	—	—	150	1.6	<.5										
	9-6-73	.26	17.3	17	3.90	3.8	89	18	—	130	1.3	<.5	11	13	2	14	1.0	5	7	—	—	252
	10-18-73	.33	19.6	9	3.70	3.7	100	6	—	191	0.7	0	8	16	1	3	0.4	6	30	10	—	245
	11-22-73	296.30	18.6	10	3.80	3.7	76	0	—	131	1.2	0	8	18	2	2	0.5	3	0	10	—	—
* Q-7	10-18-73	-	25	8	3.65	3.8	82	6	0	118	0.6	0	7	14	1	3	0.3	5	27	10	-	212
* Q-8	10-18-73	-	20	10	6.45	6.3	4	0	10	54	0.1	-	0	5	0	3	0.4	9	19	10	-	47
* Q-9	10-18-73	-	45	9	4.05	4.2	48	0	0	53	0.4	-	3	6	0.6	3	0.4	8	24	10		305

(1) DATUM USED FOR REPORTED ELEVATIONS:
Q-1 AND Q-2a, ELEVATIONS ABOVE MEAN SEA LEVEL (USGS)
Q-2b, REPORTED HEAD OVER INVERT OF PIPE
Q-3, RELATIVE ELEVATION, SEE FIGURE 2
Q-4 AND Q-5, RELATIVE ELEVATIONS, SEE FIGURE 3

NOTES:

LABORATORY TESTS WERE PERFORMED BY GWIN, DOBSON LABORATORY (3/10/73 TO 9/6/73) & BY B-H LABORATORY (9/18/73 TO THE END OF THE MONITORING PROGRAM)



* Q7, Q8, Q9 Locations

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL RESOURCES

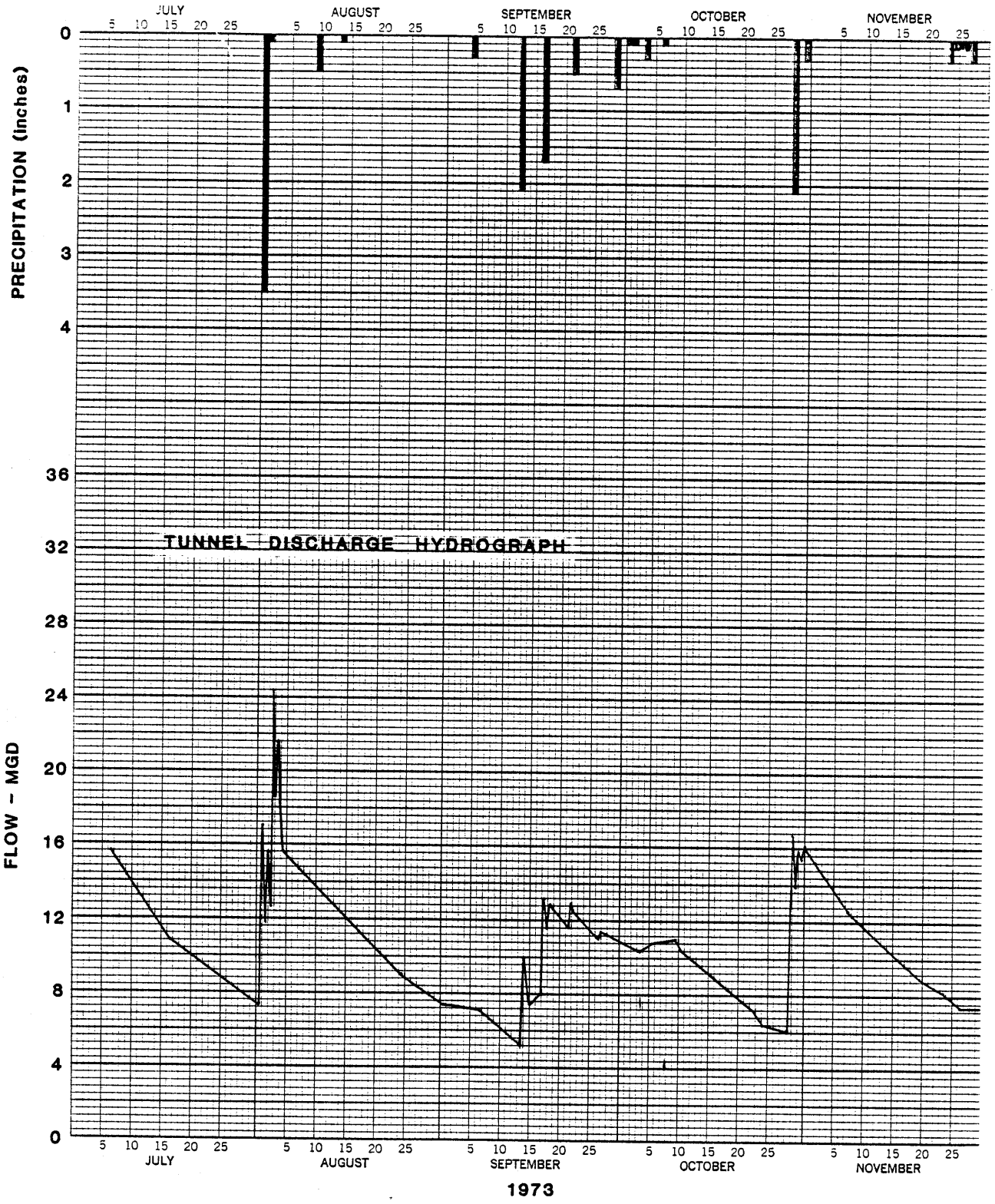
AMD ABATEMENT STUDY: PROJECT NO. SL-135-8
PACKER TOWNSHIP, CARBON COUNTY, PENNA
APPLICATION OF CRUSHED LIMESTONE FOR THE NEUTRALIZATION OF QUAKAKE TUNNEL DISCHARGES

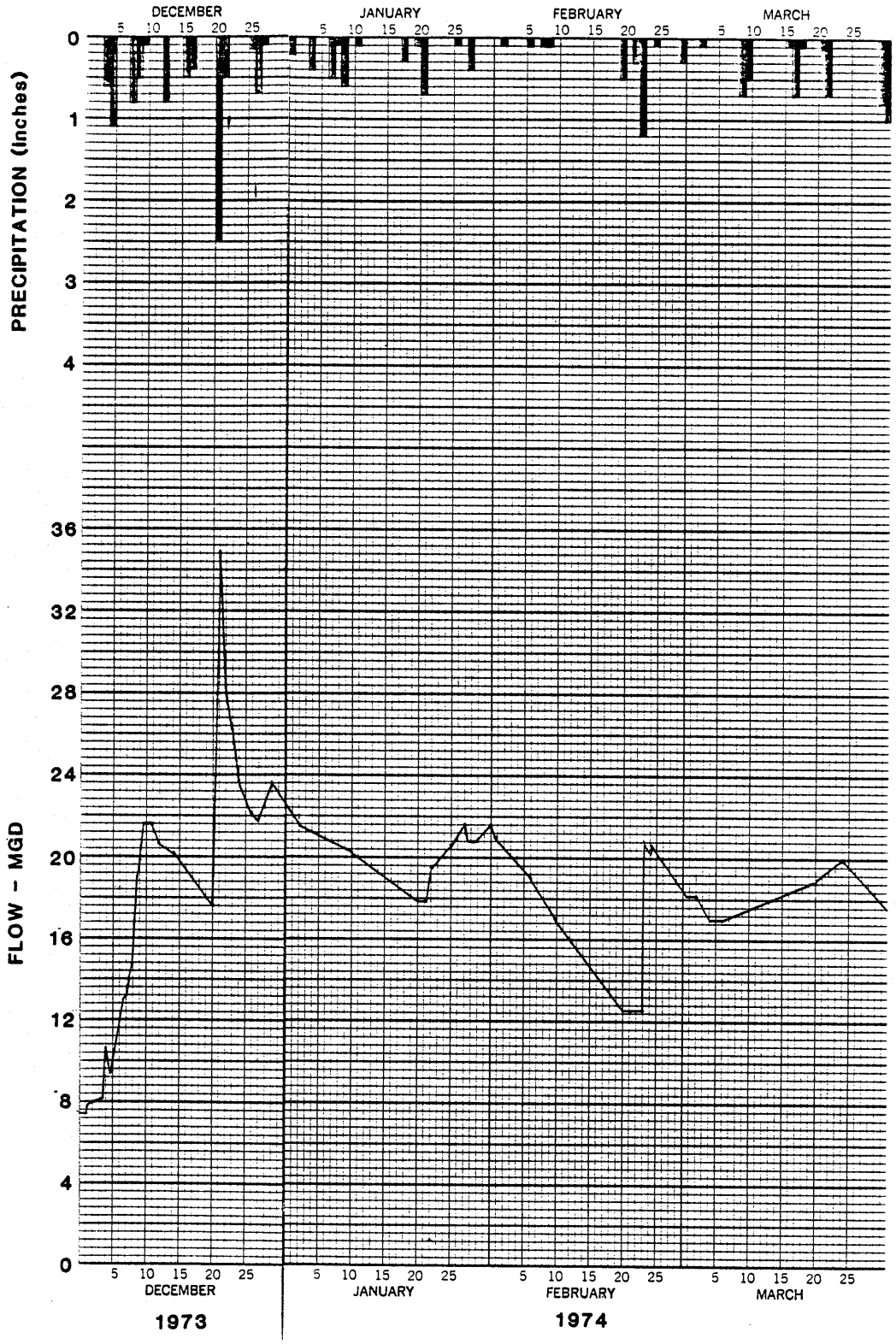
RECORDS OF MONITORING STATIONS

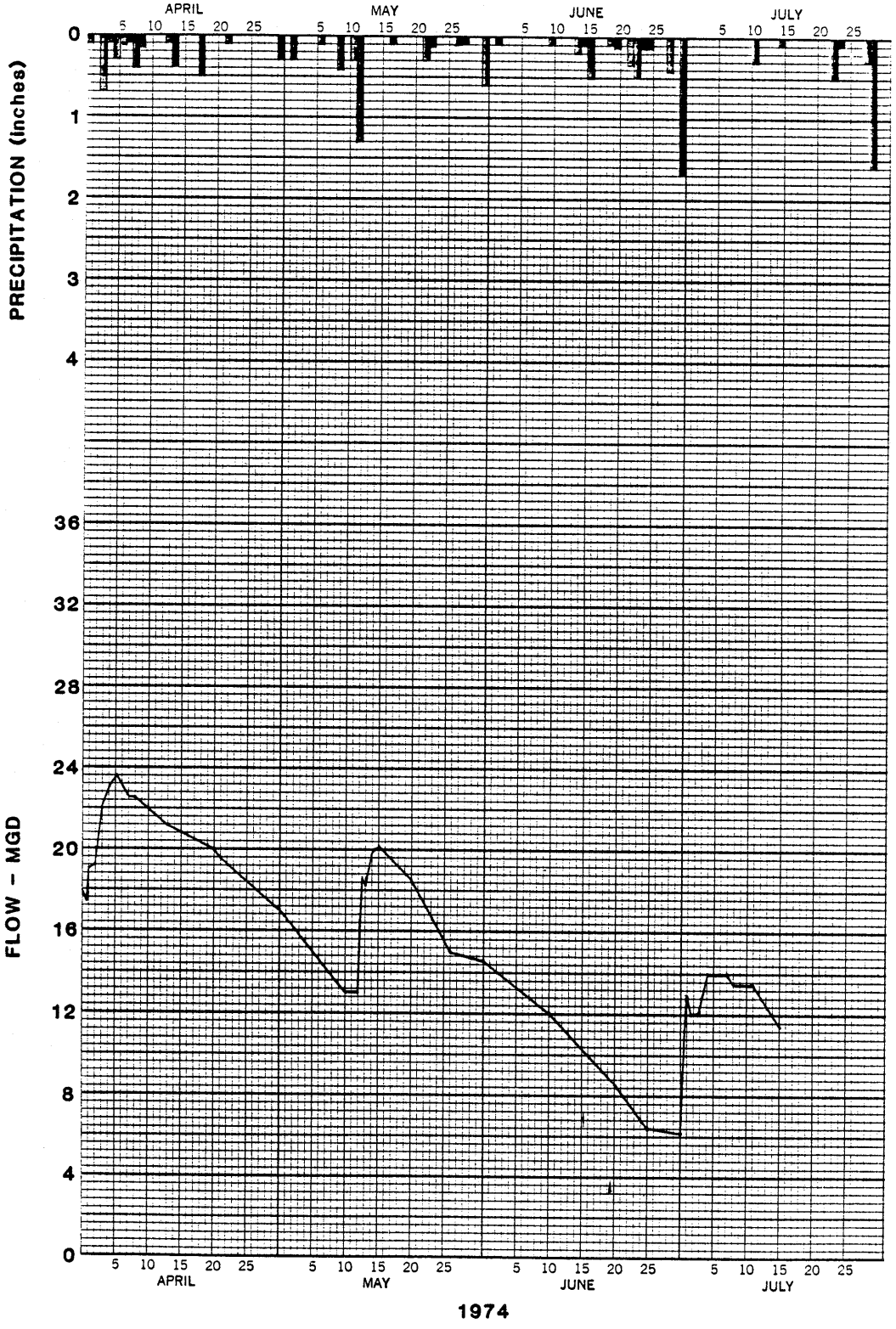
PREPARED BY
GEO-Technical Services
CONSULTING ENGINEERS & GEOLOGISTS
HARRISBURG, PENNA.
DATE: 1974

HYETOGRAPH

TAMAQUA 4N




DECEMBER
JANUARY
FEBRUARY
MARCH
5 10 15 20 25
PRECIPITATION (inches)
0
1
2
3
4
FLOW - MGD
36
32
28
24
20
16
12
8
4
0
DECEMBER
JANUARY
FEBRUARY
MARCH
1973
1974


APRIL
MAY
JUNE
JULY
5 10 15 20 25
PRECIPITATION (inches)
0
1
2
3
4
FLOW - MGD
36
32
28
24
20
16
12
8
4
0
1974

PRECIPITATION AND TUNNEL DISCHARGE MASS CURVES