

CREATE AN AMD TREATMENT SYSTEM  
TEACHER KEY/RESULTS

AV Pipe									
Date	Flow (GPM)	Dissolved Oxygen (mg/L)	pH	Alkalinity (mg/L as CaCO <sub>3</sub> )	Acidity (mg/L as CaCO <sub>3</sub> )	Sulfate (mg/L)	Total Fe (mg/L)	Total Mn (mg/L)	Total Al (mg/L)
1/10/2002	171	0.2	6.2	128	48	483	36.9	3	0
2/15/2002	144	0.09	6.2	126	16	390	38.3	2.9	0
3/24/2002	90	0.15	6	90	0	413	48.9	2.8	29
4/17/2002	152	0.19	6.2	152	0	364	46.7	3.3	0
5/20/2002	122	0.25	6.2	160	0	418	46	3.7	0
6/15/2002	135	0.3	6.3	162	0	491	41.9	3.5	0
7/19/2002	134	0.09	6.3	158	0	462	45.1	3.6	0
8/21/2002	134	0.2	6.2	152	0	482	50.3	4	0
9/10/2002	149	0.23	6.2	150	0	530	48.9	4.1	0
10/5/2002	161	0.2	6.2	146	0	504	49.1	4.4	0
11/9/2002	160	0.16	6.2	152	0	524	51.4	4.1	0
12/6/2002	161	1.25	6.2	164	0	428	46.9	3.9	0
Highest Flow	171								
Lowest Flow	90								
Net Acidity	-139.666667								
Average	142.75	0.275833	6.2	145	5.333333	457.4167	45.86667	3.608333	2.416667

TYPE OF SYSTEM      Settling Pond - Aerobic Wetland  
 SIZE OF WETLAND    1.117587 acres  
 Iron Loading        78.1711213 lbs/day  
 Manganese Loading    6.14972666 lbs/day

Acidity Loading      0

Crabtree									
Date	Flow (GPM)	Dissolved Oxygen (mg/L)	pH	Alkalinity (mg/L as CaCO <sub>3</sub> )	Acidity (mg/L as CaCO <sub>3</sub> )	Sulfate (mg/L)	Total Fe (mg/L)	Total Mn (mg/L)	Total Al (mg/L)
1/10/2002	1000	0.55	6.1	158	0	380	81.5	2.9	1.52
2/15/2002	6348	0.34	6.1	146	1.8	732	71.1	2.8	1.78
3/24/2002	3450	0.28	6.1	154	28.6	747	84.6	2.6	0.99
4/17/2002	2435	0.45	6	166	19	902	80.4	2.4	0.66
5/20/2002	2269	0.38	6.1	166	30	587	79.4	2.6	0.67
6/15/2002	1845	0.6	6.2	170	33	842	77.3	2.4	0.54
7/19/2002	1692	0.78	6.2	166	34.6	881	88.2	2.4	0.45
8/21/2002	1813	0.16	6.1	164	42	840	84.5	2.8	0.69
9/10/2002	1692	0.25	6.2	160	60.8	882	89.1	3	0.97
10/5/2002	2319	0.39	6.3	162	24.4	766	85.6	3.4	1.24
11/9/2002	3738	0.7	6.1	150	33.4	789	71	3.6	2.79
12/6/2002	5680	0.94	6	142	32.8	711	64.8	3	2.14
Highest Flow	6348								
Lowest Flow	1000								
Net Acidity	-130.3								
Average	2856.75	0.485	6.125	158.6667	28.36667	754.9167	79.79167	2.825	1.203333

TYPE OF SYSTEM      Settling Pond - Aerobic Wetland  
 SIZE OF WETLAND    25.8251 acres  
 Iron Loading        2721.46541 lbs/day  
 Manganese Loading    96.3526656 lbs/day

Acidity Loading      967.505822

Loyalhanna Borehole									
Date	Flow (GPM)	Dissolved Oxygen (mg/L)	pH	Alkalinity (mg/L as CaCO <sub>3</sub> )	Acidity (mg/L as CaCO <sub>3</sub> )	Sulfate (mg/L)	Total Fe (mg/L)	Total Mn (mg/L)	Total Al (mg/L)
1/10/2002	115	1.5	6	78	0	306	21.9	2.2	0
2/15/2002	120	0.5	6.4	140	0	597	44	3.7	0
3/24/2002	156	0.43	6.2	142	0	425	41.9	3.4	0
4/17/2002	126	0.98	6.2	88	0	409	34.3	3.2	0
5/20/2002	56	0.46	6.2	134	0	429	39.8	3.7	0
6/15/2002	93	0.28	6.2	136	0	550	36.8	3.5	0
7/19/2002	122	1.53	6.2	134	0	528	41.7	3.7	0
8/21/2002	NA	NA	6.2	138	0	513	45.5	3.9	0
9/10/2002	NA	NA	6.3	140	0	526	40.5	3.4	0
10/5/2002	139	0.21	6.2	138	0	490	46.5	4.2	0
11/9/2002	172	1.74	6.3	140	0	502	42.9	4.1	0
12/6/2002	146	1.55	6.3	137	0	496	39.5	3.9	0
Highest Flow	172								
Lowest Flow	56								
Net Acidity	-128.75								
Average	124.5	0.918	6.225	128.75	0	480.9167	39.60833	3.575	0

TYPE OF SYSTEM      Settling Pond - Aerobic Wetland  
 SIZE OF WETLAND    0.917522 acres  
 Iron Loading        58.87473 lbs/day  
 Manganese Loading    5.313962 lbs/day

Acidity Loading      0

Getty Run									
Date	Flow (GPM)	Dissolved Oxygen (mg/L)	pH	Alkalinity (mg/L as CaCO <sub>3</sub> )	Acidity (mg/L as CaCO <sub>3</sub> )	Sulfate (mg/L)	Total Fe (mg/L)	Total Mn (mg/L)	Total Al (mg/L)
1/10/2002	16.51	6.42	2.8	0	455.6	800	27.8	6.84	40.4
2/15/2002	22.66	8.81	2.8	0	460.4	785	28.3	7.02	39.5
3/24/2002	28.62	6.1	2.8	0	429.4	796	23.8	7.77	42
4/17/2002	121.96	4.5	2.8	0	445.8	696	24	6.05	38
5/20/2002	362.7	3.62	2.8	0	673.6	1208	40	7.9	61.6
6/15/2002	28.62	10.17	2.8	0	502.6	805	46.9	7.63	41.9
7/19/2002	50.25	9.46	2.8	0	541	901	49.8	8.14	43
8/21/2002	65.62	7.18	2.7	0	581.2	924	64.4	8.46	50.3
9/10/2002	91.21	8.63	2.7	0	648.6	907	72.6	5.82	49
10/5/2002	135.8	8.12	2.7	0	745.4	1168	83.8	7.18	59.1
11/9/2002	91.21	7.85	2.8	0	735.5	1085	81.2	7.75	42.7
12/6/2002	95.67	7.64	2.7	0	697.5	1107	85.9	8.1	52.9
Highest Flow	16.51								
Lowest Flow	362.7								
Net Acidity	576.383333								
Average	92.56917	7.375	2.766667	0	576.3833	931.8333	52.375	7.388333	46.7

TYPE OF SYSTEM      Vertical Flow Wetland/Alkalinity Producing System - Settling Pond - Aerobic Wetland -  
 Vertical Flow Wetland/Alkalinity Producing System...  
 Iron Loading        57.88465 lbs/day  
 Manganese Loading    8.165558 lbs/day

Acidity Loading      637.0167

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Lower Saxman									
Date	Flow (GPM)	Dissolved Oxygen (mg/L)	pH	Alkalinity (mg/L as CaCO <sub>3</sub> )	Acidity (mg/L as CaCO <sub>3</sub> )	Sulfate (mg/L)	Total Fe (mg/L)	Total Mn (mg/L)	Total Al (mg/L)
1/10/2002	1065	0.06	5.7	54	42	571	44.7	5	0.549
2/15/2002	2061	0.1	5.7	58	42	172	51.4	5.3	0.524
3/24/2002	1822	0.18	5.7	56	61	445	42.9	4.7	0.465
4/17/2002	1756	0.23	5.6	52	79.8	439	46.3	4.5	0.436
5/20/2002	1724	0.75	5.7	52	81.8	385	45.1	5.3	0.635
6/15/2002	1692	0.75	5.6	48	96.6	535	43.2	5.1	0.616
7/19/2002	1740	0.55	5.6	48	98.4	506	48.6	5	0.626
8/21/2002	1812	0.34	5.6	46	102.2	509	50.3	5.7	0.724
9/10/2002	1895	0.75	5.7	46	90.6	520	51.3	5.5	0.753
10/5/2002	2060	0.18	5.6	52	93.8	495	52.2	5.9	0.662
11/9/2002	2425	0.26	5.7	54	69.2	488	53.7	4.82	0.474
12/6/2002	1812.5	0.35	5.6	54	95.6	529	48.2	4.79	0.451
Highest Flow	2425								
Lowest Flow	1065								
Net Acidity	27.75								
Average	1822.04167	0.375	5.65	51.66667	79.41667	466.1667	48.15833	5.134167	0.57625

TYPE OF SYSTEM Anoxic Limestone Drain (no flushing Mechanism)- Settling Pond - Aerobic Wetland

Iron Loading 1047.61763 lbs/day

Manganese Loading 111.686662 lbs/day

Acidity Loading 1727.59924

Hawk									
Date	Flow (GPM)	Dissolved Oxygen (mg/L)	pH	Alkalinity (mg/L as CaCO <sub>3</sub> )	Acidity (mg/L as CaCO <sub>3</sub> )	Sulfate (mg/L)	Total Fe (mg/L)	Total Mn (mg/L)	Total Al (mg/L)
1/10/2002	15	0.66	3.4	0	307.4	1367	4.6	27.7	34.4
2/15/2002	19	0.73	3.4	0	239.4	1087	3.5	30.1	33.6
3/24/2002	10	1.47	3.4	0	251.6	1048	2.24	25.5	25.5
4/17/2002	14	0.55	3.3	0	307.4	1036	4.5	26.7	29.3
5/20/2002	11	0.67	3.4	0	308.2	1012	3.9	25.9	24.9
6/15/2002	9	0.76	3.4	0	308.4	1048	2.98	25.1	28.3
7/19/2002	2	0.46	3.3	0	249.4	1207	2.65	29.3	32.3
8/21/2002	5	0.56	3.4	0	261.6	1284	3.78	25.7	31.7
9/10/2002	18	0.46	3.4	0	310.2	1175	4.03	28.3	25.9
10/5/2002	16	0.47	3.3	0	285.3	1076	4.08	30.2	33.4
11/9/2002	10	0.59	3.3	0	245.9	1302	5.67	24.9	27.7
12/6/2002	18	0.99	3.5	0	299.1	1258	5.24	30	30.1
Highest Flow	19								
Lowest Flow	2								
Net Acidity	281.1583333			average acidity - average alkalinity			positive = net acidic		negative = net alkaline
Average	12.25	0.6975	3.375	0	281.1583	1158.333	3.930833	27.45	29.75833

TYPE OF SYSTEM Limestone Pond - Settling Pond - Aerobic Wetland - Compost Wetland

Iron Loading 0.57490193 lbs/day = lbs/day (Average Iron \* Average Flow)/83.2

Manganese Loading 4.01468507 lbs/day = lbs/day (Average Manganese \* Average Flow)/83.2

Upper Saxman									
Date	Flow (GPM)	Dissolved Oxygen (mg/L)	pH	Alkalinity (mg/L as CaCO <sub>3</sub> )	Acidity (mg/L as CaCO <sub>3</sub> )	Sulfate (mg/L)	Total Fe (mg/L)	Total Mn (mg/L)	Total Al (mg/L)
1/10/2002	1025	0.6	5.4	38	66	473	47.1	4.9	1.91
2/15/2002	920	1.26	5.3	32	68	599	45.6	5.4	2.38
3/24/2002	3738	0.8	5.4	36	66	403	52.4	5.9	2.28
4/17/2002	208	0.54	5.5	44	58	486	43.4	5.2	1.9
5/20/2002	220	0.86	5.1	26	90	392	44	5.7	3.01
6/15/2002	188	1.01	5.2	24	109	604	41.9	5.7	3.31
7/19/2002	326	1.15	5.2	22	117.4	543	47.9	5.9	3.09
8/21/2002	196	0.97	5.2	28	116.4	529	51.9	6.3	2.82
9/10/2002	563	0.58	5.4	30	126.4	570	50.7	5.8	2.33
10/5/2002	1812	0.39	5.4	34	116.6	495	50.2	5.9	1.98
11/9/2002	1574	0.71	5.5	44	101.2	470	54.4	4.8	1.55
12/6/2002	2695.2	0.92	5.6	44	85.6	575	51	5.2	1.6
Highest Flow	3738								
Lowest Flow	188								
Net Acidity	59.8833333								
Average	1122.1	0.815833	5.35	33.5	93.38333	511.5833	48.375	5.558333	2.346666667

TYPE OF SYSTEM Anoxic Limestone Drain (no flushing Mechanism)- Settling Pond - Aerobic Wetland

Iron Loading 648.0755 lbs/day

Manganese Loading 74.46449 lbs/day

Acidity Loading 1251.048