

Greenbrier County



Green Run Site



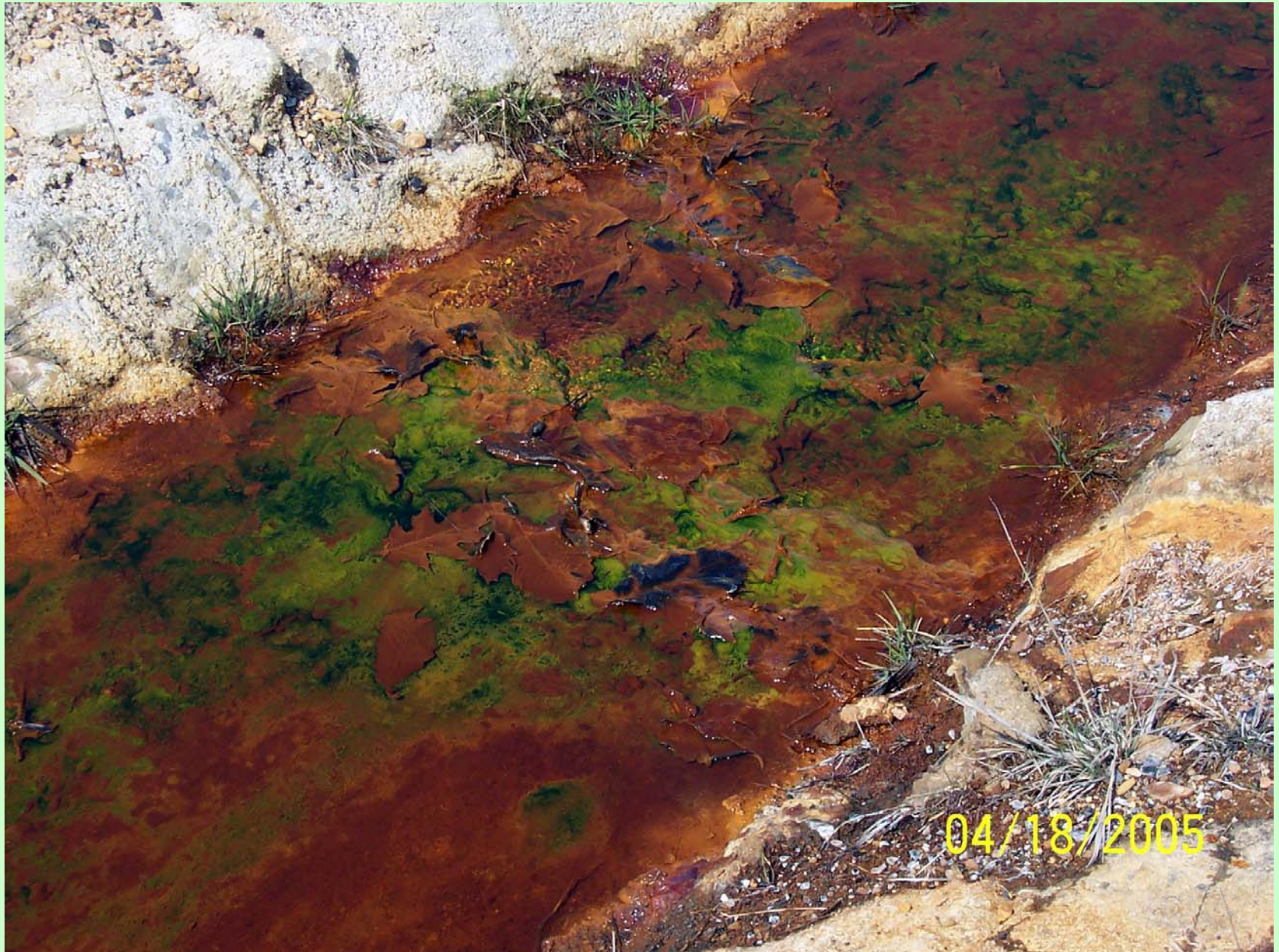
Green Run Wet Seal Discharges



Green Run Flume



Green Run Flume Bio-Mass



Green Run Top of Flume



Green Run Top of Flume and Wet Seals



Green Run Top of Flume to Bottom of Flume



Green Run Raw Water Quality

PAR.	Wet Seal	Top of Flume	Mid. of Flume	Bot. of Flume
pH	2.88	2.81	2.83	2.82
Alk.	<0.05	<0.05	<0.05	<0.05
Acid.	694.54	642.44	624.78	516.40
Turb.	11.00	21.00	16.00	14.00
Cond.	1,483.00	1,521.00	1,502.00	1,485.00
Sul.	968.91	961.65	941.20	890.77
Chlor.	3.18	2.99	2.78	4.09
T. Fe	217.10	193.10	176.50	119.30
D. Fe	212.70	187.70	174.80	117.20
T. Mn	1.98	2.18	2.24	2.17
D. Mn	1.97	2.14	2.15	2.09
T. Al	45.35	42.86	41.69	37.99
D. Al	44.29	42.49	41.47	37.39
T. Na	1.54	1.33	0.92	1.36
D. Na	0.57	1.10	0.85	0.91
T. Mg	16.51	17.51	17.51	17.38
D. Mg	16.45	17.49	17.40	16.98
T. Ca	39.88	54.08	58.67	84.38
D. Ca	39.53	53.75	58.30	82.20
T. Hard.	167.57	207.14	218.60	282.27
D. Hard	166.45	206.24	217.23	275.18
TSS	10.00	16.00	8.00	8.00
TDS	1,310.00	1,321.00	1,259.00	1,150.00

Top of Flume Analysis

Site	Date	pH	Acidity	Cond.	Sul.	Al	Fe	Mn
Top of Flume	2/27/04	2.70	697	2,250	967	28.30	163.00	1.59
Top of Flume	6/4/04	2.70	626	2,270	1,460	38.00	116.00	2.13
Top of Flume	9/16/04	2.60	1,467	4,600	1,300	88.10	404.00	3.76
Top of Flume	2/7/05	2.81	746	1,521	962	42.86	193.10	2.18

Bottom of Flume Analysis

Site	Date	pH	Acidity	Cond.	Sul.	Al	Fe	Mn
Bot. of Flume	2/27/04	2.90	375	1,074	486	26.50	60.50	1.75
Bot. of Flume	6/4/04	2.80	400	1,320	798	31.10	53.60	2.06
Bot. of Flume	9/16/04	2.70	944	2,370	1,240	67.40	172.00	4.03
Bot. of Flume	2/7/05	2.80	549	1,485	891	37.99	119.30	2.17

Green Run Lab Versus Calculated Acidity

Sample ID	Site Description	Date	Lab pH	Lab Hot Acidity mg/l as CaCO3	Calculated Acidity	Field Cond uS	Lab Cond uS	SO4 mg/l	T Al mg/l	T Fe mg/l	T Mn mg/l
325	Combination of wetseal discharges at top of grouted channel	2/27/04	2.7	499	697	1142	2250	967	28.3	163	1.59
325	Combination of wetseal discharges at top of grouted channel	6/4/04	2.7	605	626	1258	2270	1460	38	116	2.13
325	Combination of wetseal discharges at top of grouted channel	9/16/04	2.6	215	1467	2324	4600	1300	88.1	404	3.76
375	Combination of wetseal discharges at bottom of OLC	2/27/04	2.9	337	375	1074	1900	486	26.5	60.5	1.75
375	Combination of wetseal discharges at bottom of OLC	6/4/04	2.8	415	400	1320	2000	798	31.1	53.6	2.06
375	Combination of wetseal discharges at bottom of OLC	9/16/04	2.7	1240	944	2370	3670	1240	67.4	172	4.03

Green Run Top/Bottom Effluent Comparisons

Site	Date	pH	Cal. Acidity	% Acidity Reduction	Fe	% Fe Reduction
Top of Flume	2/27/04	2.70	697	-----	163.00	-----
Bottom of Flume	2/27/04	2.90	375	46%	60.50	63%
Top of Flume	6/4/04	2.70	626	-----	116.00	-----
Bottom of Flume	6/4/04	2.80	400	36%	53.60	54%
Top of Flume	9/16/04	2.60	1,467	-----	404.00	-----
Bottom of Flume	9/16/04	2.70	944	36%	172.00	57%
Top of Flume	2/7/05	2.81	746	-----	193.10	-----
Bottom of Flume	2/7/05	2.82	549	26.41%	119.30	38%

Top/Mid/Bottom of the Flume--Chemical Consumption and Cost Comparisons

Parameters	S.P.1	S.P.2	S.P.3
pH	2.90	2.67	2.61
Average Flow--gpm's*	20.00	20.00	20.00
Gals. of 20% NaOH/Gal. of Treated Water	0.0098	0.0044	0.0028
Annual Consumption of 20% NaOH--gallons	103,018	46,252	29,434
Average Cost per Gallon for 20% NaOH	\$ 0.50	\$ 0.50	\$ 0.50
Annual Chemical Cost	\$ 51,509.00	\$ 23,126.00	\$ 14,717.00
Gals. Sludge/Gal. of Treated Water	0.0218	0.0072	0.0072
Annual Gallons Sludge Produced	229,161	75,686	75,686
Annual Sludge Disposal Cost at \$0.05/Gal.	\$ 11,458.00	\$ 3,784.00	\$ 3,784.00
Total An. Chemical & Sludge Disposal Cost	\$ 62,967.00	\$ 26,910.00	\$ 18,501.00

Ferrous to Ferric—Top to Bottom



Bug Central



**Picture of 21mm Thiobacillus swimming up-stream.
See it jumping over that big orange clump of “bio-mass”.**