

pH of Air Cooled Blast-Furnace Slag Leachate Over a Six Month Period February-August 2002

Introduction

Air cooled blast-furnace slag used in base and fill in road construction has occasionally led to contamination of natural water by the leaching of sulphur compounds, particularly CaS. High pH can be an indicator of such contamination. This test procedure was developed to measure the pH of ACBF slag leachate over a period of six months. It extends the duration of an earlier test that took measurements for one week.

Procedure

One week test

Approximately 500 grams of fresh, one year old, and two year old slag was placed in a 1000 mL beaker. Distilled water was added to cover the slag by about two inches. Sufficient quantities of the leachate was gathered off the top for pH testing.

Six month test

The remaining leachate was drained from the slag samples. Each sample was rinsed once with distilled water and then filled to the 600 mL mark. Each sample was stirred weekly with a glass stirring rod. pH measurements were initially taken weekly until a flat line was established. After four weeks measurements were taken monthly for the duration of the test. A Thermo Orion model 410 a+ pH meter was used.

Results

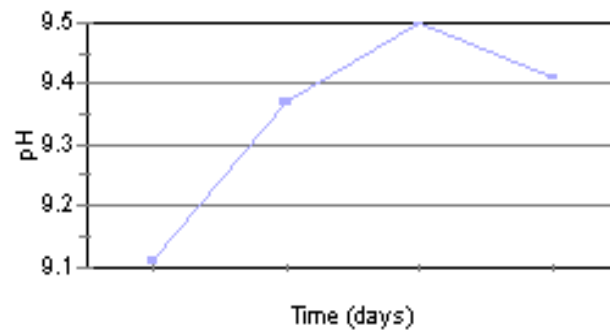
One Week Test

pH Over Time

	1 day	2 days	4 days	7 days
fresh	9.11	9.37	9.50	9.41
1 year	8.77	8.74	8.75	8.86
2 year	8.62	8.61	8.47	8.31

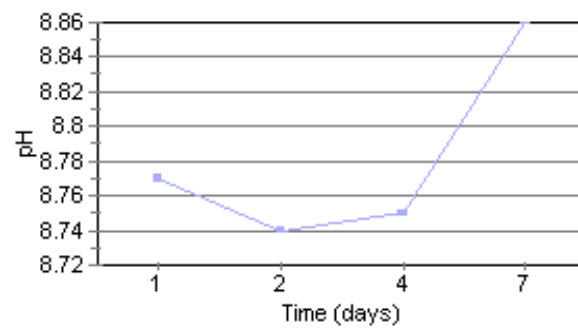
Slag Leachate pH Over Time

Fresh



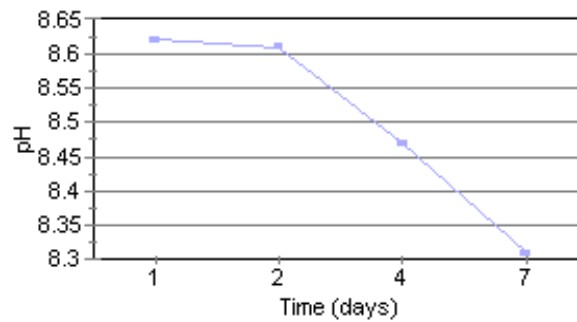
Slag Leachate OverTime

1 Year Old

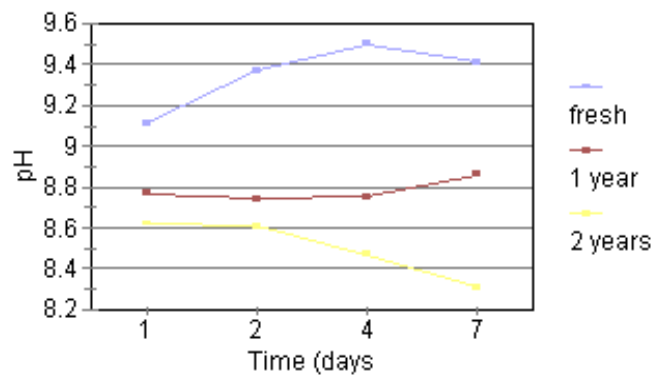


Slag Leachate Over Time

2 Year Old



Slag Leachate pH Over Time



Observations

The fresh sample turned greenish with a strong sulphur smell while the one and two year old samples remained relatively clear and odor free.

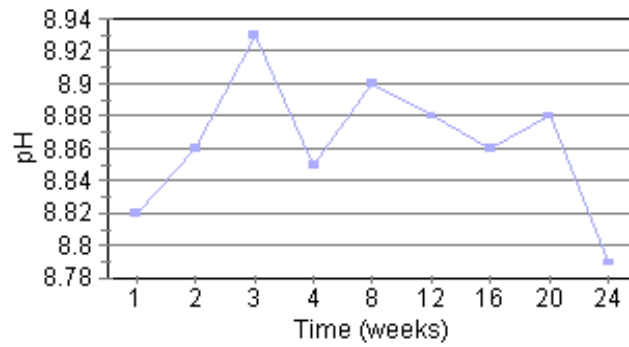
Results-Six Month Test

pH Over Time

	week 1	wk 2	wk 3	wk 4	wk 8	wk 12	wk 16	wk 20	wk 24
fresh	8.82	8.86	8.93	8.85	8.90	8.88	8.86	8.88	8.79
1 year	8.48	8.46	8.48	8.38	8.38	8.36	8.36	8.39	8.31
2 year	8.00	8.13	8.15	8.14	8.15	8.16	8.18	8.17	8.12

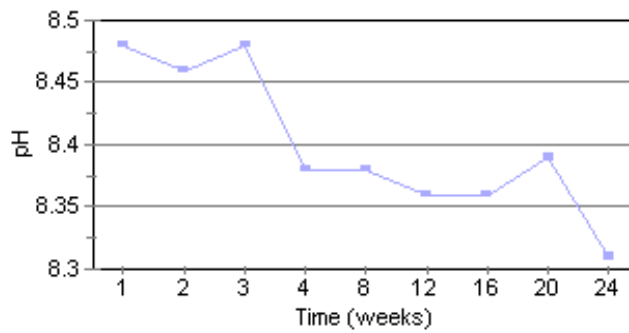
Slag Leachate pH Over Time

Fresh



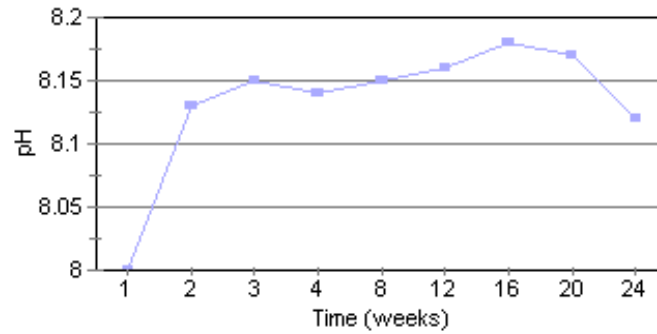
Slag Leachate pH Over Time

1 Year Old

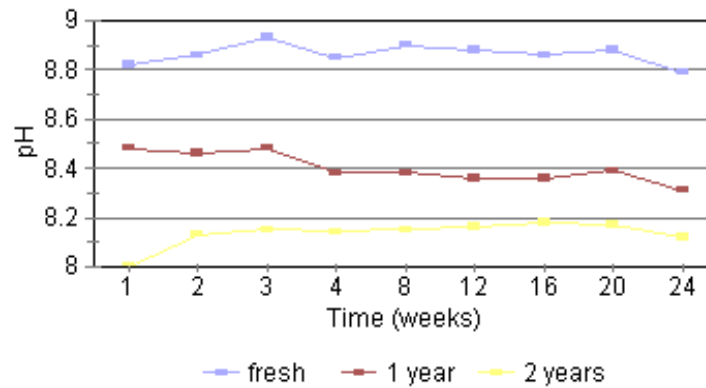


Slag Leachate pH Over Time

2 Year Old



Slag Leachate pH Over Time



Observations

All three samples were clear and had little odor.

Conclusion

The pH of slag leachate after one week of soaking remains stable over a six month period in a closed environment. Aged slag leachate has a lower pH than fresh. Rinsing the slag and adding fresh water lowers the pH of both fresh and aged samples and eliminates the green color and odor of the fresh sample leachate. The effects of surface contaminants of ACBF slag seem to be transient with aging.