

MEMORANDUM

To H.E. Pawson; c.c. C.O.C.
From R.J. Tucker
Subject Carbon Plant Waste Treatment

Date May 26, 1975
Ref.

A sample of untreated Carbon Plant Residue (CPR) was added daily to a 20 gallon plastic tank. Twenty-four hours after the 12th addition the liquid/solid volume ratio was 1.27:1. Approximately $\frac{1}{2}$ (3 gallons) of the clear supernate (D.T.B.) was drawn off and treated with 10, 20 and 30 #CaO/ton of solution resulting in the following pH's and arsenic assays.

CaO	pH	p.p.m. As.
Initial 0	3.0	1615
10	11.0	190
20	11.7	3.5
30	11.6	7.0
30 3 days later	11.6	5.5
30 8 days later	11.7	5.4

The lime treatment of the clear D.T.B. produced a liquid/precipitate volume ratio of approximately 5:1.

In addition a portion of D.T.B. was mixed with #3 agitator Discharge (1 part D.T.B. to 20 parts #3 Ag.) and then treated with 2#CaO/ton of soln.

	pH	p.p.m. As.	As.
#3 Agitator	11.7	17.5	Removal
D.T.B.	8.1	1532	
Combined 1/20	11.5	27.0	70.0%
+ 2 #CaO/ton	11.6	10.5	88.4%
3 days later	11.6	5.5	94.0%

Theoretical, combined arsenic based on #3 Ag. Disch of 17.5 p.p.m. As. and D. T.B. of 1532 p.p.m. As. mixed 20:1 is 90 p.p.m. As.

A daily sample of treated #5 Agitator Discharge was taken concurrently with the C.P.R. sample for 12 days and stored in a second 20 gallon tank. After 12 days the liquid/solid volume ratio was 0.19:1. The supernate was sampled on the 12th, 15th, and 20th days after sample collection was started.

	pH	p.p.m. As.
12th day	11.4	11.5
15th day	10.1	16.8
20th day	9.8	45.0

With continued additions of lime treated #5 agitator discharge, a high pH and thus good arsenic suppression were maintained. However, once additions were stopped the pH dropped and the arsenic level rose as previously indicated. In addition, a good liquid/solid separation by settling was not easily achievable.

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Daily additions of C.P.R. (to the 20 gal. tank) were continued for a further eight days. At this time the L/S volume ration was 0.94:1

The clear solution from the initially treated D.T.B. was drawn off and discarded. Another 3 gallons of clear untreated D.T.B. was drawn off and treated with 30 #CaO/ton of soln. and this treated solution was added to the precipitate from the initial D.T.B. treatment.

A second portion of D.T.B. was drawn off, treated with 30#CaO/ton and aerated in a float cell for 30 minutes.

	<u>pH</u>	<u>p.p.m. As.</u>
D.T.B. May 13th	7.5	1600
May 13 D.T.B. + 30 #CaO/ton	11.7	6.5
May 13 Treated D.T.B. added to ppte. from May 5th	11.7	6.1
May 13 D.T.B. + 30#CaO/ton aerated in Float Cell	11.8	6.4

The addition of one bucket of C.P.R./day resulted in a total liquid/solid ratio of 1.35:1

On the following day (May 14th) another 3 gallons of D.T.B. were drawn off leaving 21" of solution above the solids. This portion was treated with 30#CaO/ton of solution.

	<u>pH</u>	<u>p.p.m. As.</u>
D.T.B.	7.6	1300
May 14 D.T.B. + 30#CaO/ton	11.5	9.5

To the 14th of May (21 days) total solids obtained represented 12" in the 20 gallon container while the total solution including that removed for lime treatment tests represented 18" in the 20 gallon tank (L/S vol. ratio = 1.5:1)

The tests indicate:

- A liquid solid separation to produce a clear D.T.B. is possible based on settling.
- 65-70% of D.T.B. could be removed from the C.P.R. in this manner.
- 30#CaO/ton D.T.B. would produce a second clear solution containing 5 - 10 p.p.m. As. - this solution can also be separated from the precipitate by settling

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- Lime treatment of the total C.P.R. produces a combined solids - precipitate slurry from which only a minimal amount of clear solution can be separated by settling.
- Lime treating a 20:1 combination of #8 ag. disch. and D.T.B. would produce an effluent of 10 p.p.m. As.

RJ Tucker