Gray, Jeff

From: Gray, Jeff

Sent: Tuesday, August 29, 2006 8:57 AM

To: Purkey, Ronald E; Johnson, Linden Printz; Campbell, Linda F; Knight, Tony Alan; Dixon, Melisa D; Lennon, Kendal R; Quinn, James Roy III; McDonald, Cathy L; Varner, Arthur L; Williams, Brian E; Carter, James C Jr; Nelson, Gary R; Rehberg, Robert L

Cc: Olmstead, Chadwick Regan; Hedgecoth, Melissa A; Thompson, Melissa A; Lundy, Dennis L; Cahill, Donald Patrick; Gray, Jeff; Petty, Harold L

Subject: FW: KIF CO2 Flowrate

FYI. We will review this information at our KIF Plant meeting Thursday, August 31st.

Thanks,
Jeff L. Gray
EDS, Civil Engineering
423-751-7693
423-751-6116 (Fax)
-----Original Message-----
From: Knight, Tony Alan
Sent: Tuesday, August 29, 2006 8:49 AM
To: Purkey, Ronald E
Cc: Gray, Jeff; Carter, James C Jr; Olmstead, Chadwick Regan; Campbell, Linda F; Johnson, Linden Printz; Shaffer, Douglas P; Dixon, Melisa D; Rehberg, Robert L
Subject: RE: KIF CO2 Flowrate

Answers to questons 3a-g:

a. Alternatives to CO2 that have been evaluated are stack gas emission removal and acid drip systems. Stack gas removal appeared to be a great use of the gas, however, because of the many different constiuents that make up the gas, purifying the CO2 would be very difficult. This was evaluated for the PAF CO2 system.

Acid drip systems are an effective alternative. The main concerns with these types systems are there are no control on flow and safety concerns are moderate.

b. Approximately 3.9 tons/day, data and calcs. in attached spreadsheet. (Very similar to the JSF flowrate)

c. Data will be collected this winter to help evaluate what type system will be needed for increasing the pH.

d. Because of the high efficiency of the liquid injection over the gaseous injection, the liquid injection is recommended.

e. A good location for the chemical feed would be adjacent to or inside the discharge weirs going from the main ashpond into the stilling pond.

f. Minimal safety concerns with CO2. Other chemicals that may be required for raising the pH will be evaluated at a later time.

g. Carbon Steel Tank

Based upon the pond chemistry and estimated runoff data, it appears that this system will be very similar to the system currently in the Phase II Design at JSF. I believe that there can be some cost savings for the KIF from the lessons learned from the JSF Phase I Design.

Please let me know if there is any additional information that needs to be incorporated.

Thanks
Tony Knight
423.751.7332
423.596.9000 Cell#

-----Original Message-----
From: Purkey, Ronald E
Sent: Monday, August 28, 2006 12:43 PM
To: Knight, Tony Alan
Cc: Gray, Jeff
Subject: FW: KIF CO2 Flowrate

Tony,
Please take each deliverable below and either answer or refer to the email to Jeff for answers. Thanks.

Ron

3. Tony Knight will lead the effort to obtain the information in item 2. Tony will have the final information available 8/24/06. The deliverables will be as follows:

a. Look at alternatives to CO2 and NaOH
b. Feed rate for CO2
c. Feed rate for NaOH (or other)
d. Method of chemical feed recommendations
e. Location of chemical feed recommendations
f. Safety considerations for all chemicals
g. Tank Material recommendations

-----Original Message-----
From: Gray, Jeff
Sent: Monday, August 28, 2006 12:03 PM
To: Purkey, Ronald E; Johnson, Linden Printz; Shaffer, Douglas P; Dixon, Melisa D; Campbell, Linda F
Cc: Petty, Harold L; Gray, Jeff
Subject: FW: KIF CO2 Flowrate

FYI,

Thanks,
Jeff L. Gray
EDS, Civil Engineering
423-751-7693
423-751-6116 (Fax)

-----Original Message-----
From: Knight, Tony Alan
Sent: Monday, August 28, 2006 11:52 AM
To: Gray, Jeff
Subject: KIF CO2 Flowrate

Jeff,

I have reviewed the data from the lab in Muscle Shoals that performed the CO2 titration. Using the titration data and the ashpond discharge flowrate of 43 MGD combined with the runoff from the Dredge Cell 10 year 24 hour storm event gave a total of 56 MGD that would need to be treated.

The daily CO2 usage is approximately 3.9 tons/day at an efficiency of 90% with the liquid injection system. Gas sparging is only 50-60% efficient and would require almost 8 tons/day.

The data from the Emory River samples showed pH's in the 7.5 range and would not need treatment. Additional samples will need to be collected during the winter system to obtain data to design a system to increase the pH. We will continue to investigate treatment systems for increasing pH's.

I have included the workbook with the data that was used for calculating the CO2 usage. Please let me know if anything additional needs to be added.

Thanks
Tony Knight
423.751.7332