UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 7
901 N. 5th STREET
KANSAS CITY, KANSAS 66101

AIR PERMITTING AND
COMPLIANCE BRANCH

August 7, 2006

Michael Manning
Air Quality Program Manager
2400 Troost Avenue
Kansas City, MO 64108

Dear Mr. Manning,

On July 24, 2006, we received a draft Prevention of Significant Deterioration (PSD) permit for the proposed replacement of the Cargill soybean plant in Kansas City, Missouri. The draft permit was issued for public review on or around July 9th and comments are due on August 9, 2006. We appreciate the opportunity to evaluate the draft permit and associated documents and have a number of observations which you can find in Attachment A.

If you have any questions, please contact Jon Knodel at knodel.jon@epa.gov or (913) 551-7622.

Sincerely,

JoAnn Heiman, Chief
Air Permitting and Compliance Branch

Cc: Kyra Moore, MDNR

Attachment A
EPA Region 7 Comments on
Cargill Soybean Plant
Kansas City, Missouri

Solvent Loss Ratio as BACT

The solvent loss ratio (SLR) provides a measure of how much solvent is takes per ton of soybeans crushed to recover soybean oil. In the application, Cargill seeks a VOC BACT limit of 0.175 gallons solvent lost per ton of bean processed; based primarily on an agreement reached with EPA and states under a national new source review settlement. This limit represents an average across all Cargill soybean oil plants in the United States. Based on historical emissions at the Cargill-KCMO and other Cargill facilities, recently permitted soybean plants and the presumption that a new state of the art facility should have lower emissions than the norm, the Kansas City Health Department (KCHD) proposed a BACT limit of 0.145 during the first 12 months and 0.140 thereafter, both expressed as a 12-month weighted rolling average. The difference in the limits proposed by Cargill and KCHD continues to be controversial.

Based on our review of the record, it isn't clear that a top down analysis has been performed by the company. The record clearly analyses a number of control technologies and appropriately dismisses them as technically infeasible. The record also clearly lists recent permits for soybean plants, many of which have limits lower than those proposed by Cargill and others that are higher. While such lists, such as those from EPA's RACT-BACT-LAER Clearinghouse can help inform the BACT analysis, they are not generally that useful because they rarely reflect what is being achieved in practice. Lastly, Cargill contends that BACT should be set at the same level reflected in its national settlement with EPA. But, this approach has little connection to what a state of the art plant can achieve in practice. To supplement the record, KCHD asked Cargill to provide data for its other plants and offered the opportunity to Cargill to describe what factors make the new plant unique and might prevent it from meeting the lower emissions thresholds proposed in the permit. Cargill provided the data, which KCHD contends affirms that a lower BACT emission limit can be met. Although we didn't conduct an independent detailed BACT analysis of our own, we agree that the data relied upon by KCHD supports the lower BACT threshold. Since we see no analysis in the record on why the new plant can't meet emission levels being achieved elsewhere, presumably at older plants that are not as well controlled, there seems to be little basis for setting the limit at the higher level proposed by Cargill.

We also reaffirm that the 0.175 limit proposed in the application in no way was presumed by EPA as BACT in the national settlement. Indeed, this was a national limit to be achieved across a number of Cargill plants across the U.S. Where such average is derived from plants that emit above the threshold and balanced by those that emit below, we would certainly expect a new, state of the art plant to be on the lower end of the 0.175 average. While not a direct factor in the BACT selection process, if BACT were to be set at this threshold, it would offer little incentive for Cargill to operate the KCMO plant at peak performance to minimize emissions where its other plants are already below the threshold. In an area like Kansas City, on the cusp of non-compliance with the 8-hour national ambient air quality standards for ozone, it would

seem prudent to drive VOC emissions, and in this case the SLR, as low as possible within the confines of the BACT analysis.

Cargill is free to perform a top down analysis, using the selected solvent recovery technology but over a range of lower emission limitations, to make a showing that the total and incremental cost effectiveness of enhanced VOC control are unreasonable. In other words, it may be possible to show that at some value below 0.175, it is no longer economical to recover VOC emissions. At this point, though, this information is not in the record and therefore is unavailable to inform the BACT limit. Unless such an analysis is performed, it appears that the level established by KCHD is one which is achieved in practice and is presumably cost reasonable.

In the alternative, it may be appropriate to evaluate the use of a variable, weighted, annual average if the department is persuaded that the SLR increases as production increases. Data supplied by Cargill for six of its plants seems to indicate that at production levels higher than 90%, the SLR trends upwards. So, for example, on those days the plant is operating at or below 90% of production capacity, the limit would be as proposed in the draft PSD permit. For those days when the production level is higher than 90%, the limit could be set at some threshold marginally higher; say 0.02-0.04 as supported by the data.

To illustrate, say Cargill operates 200 days at capacity lower than 90%. On those days, the compliance target would be 0.14 (0.145 in the first year). For another 150 days, assume the plant operates at higher than 90% capacity. If the compliance target for these higher production days is 0.170, then Cargill would demonstrate compliance if its annual, weighted SLR is less than 0.152 [(200*.14 + 150*0.17)/350] gallons solvent per ton crush.

The limit would vary from year to year depending on actual production rates, but as long as actual annual emissions are less than the weighted target emissions, then the plant would be in compliance. This alternate approach recognizes Cargill's concern about higher solvent loss per unit or production at higher production rates and offers flexibility to operate the plant at or near its capacity without having to curtail production. But, it also assures that at lower production rates, Cargill maintains a rigorous plan to minimize VOC emissions. This compromise is consistent with other "sliding scale" BACT limits where the operation experiences wide emissions variability influenced by fuel or other process considerations.

Loss of 3rd Party Steam Source

Cargill proposes to retire its existing boiler(s) as part of the much broader existing plant shutdown. In place of the existing plant, Cargill plans to build a state of the art soybean oil extraction facility, but will obtain its steam through a 3rd party steam vendor. This raises potential PSD implications if the mutual steam contract is later dissolved and Cargill must produce its own steam. If this occurs in a short period after the new plant comes on line, it could raise questions about circumvention of the PSD requirements; in particular for pollutants like PM10 which marginally avoided PSD review through netting.

Even where there is a remote possibility that Cargill might have to provide its own steam, it would be appropriate to discuss the consequences and establish any necessary permit conditions to assure that the PSD requirements would be met if a boiler installation is required. For example, PM10 could retroactively trigger the PSD significance applicability threshold and Cargill may have to re-evaluate BACT for all of the PM10 emitting equipment, including the boiler. Further, it is possible that the PM10 modeling significance thresholds could be exceeded and Cargill may have to performed detailed NAAQS and increment modeling. Considering the projected impacts in the first round of modeling, which was later shelved when PM10 was netted out, there could be implications for additional control for the plant if emissions caused a significant contribution to a modeling NAAQS exceedance (by another source) or if Cargill itself creates adverse impacts. Lastly, depending on the type of boiler installed and the level of emissions, BACT review could certainly be triggered for SO2 and NOx.

To assure that there is no confusion later on, it would be helpful to discuss this possibility as part of the permitting record. Many states establish a period of time, in some cases as much as five to seven years after initial construction, to evaluate such changes. In any case, the clearer the permit is now, the less confusion there is later.

Particulate Matter Control Equipment Performance Monitoring

Condition V. establishes a once-a-week requirement to measure pressure drop on emission units equipped with baghouses. EPA's Compliance Assurance Monitoring Technical Guidance Document, at Section A.10. < http://www.epa.gov/ttn/emc/cam/ap-a8-15.pdf, page 11), suggests that such monitoring be performed continuously and recorded no less than once daily. While some of the emission points controlled by baghouses are unlikely to be subject to CAM, others likely are. As always, we encourage incorporation of CAM-like monitoring into the PSD permit – whose compliance provisions must stand on their own – for easier incorporation into the Title V permit later on.

Predicted PM10 NAAQS Exceedances from Sources Other Than Cargill

Original modeling performed for the project indicated potential PM10 exceedances of the NAAQS in the area surrounding the existing plant with Cargill's contribution at or very near the Class II increment thresholds. Since the new Cargill facility had greater than significant impact, the PSD permit could not be issued until the other air quality problems were resolved. Instead, Cargill re-evaluated its PM10 emissions, shut down additional equipment, and ultimately performed an analysis to net out of PSD review for PM10. Since the Cargill project was no longer reviewable for PM10, the PSD permitting action could move forward.

However, this doesn't resolve the possibility that PM10 problems remain. Once source, identified only as "PACK" had predicted PM10 concentrations at nearly six times the National Ambient Air Quality Standards. It's conceivable, even though not required to model, that Cargill could continue to have significant impact at this receptor.

We encourage KCHD to work with MDNR to further investigate the predicted NAAQS exceedance at "PACK" and require the appropriate control measures, if necessary. To the extent

this problem isn't resolved and other companies are interested in locating in this area, or say Cargill later attempts to install a boiler, this could be a major obstacle.

[End of Comments]

Jon Knodel/ARTD/R7/USEPA/US
08/08/2006 10:43 AM

To Michael_Manning@kcmo.org
cc emily.wilbur@dnr.mo.gov, kyra.moore@dnr.mo.gov, kendall.hale@dnr.mo.gov, Richard Tripp/ARTD/R7/USEPA/US@EPA, JoAnn
bcc
Subject Example of Cargill SLR Calculations (using a 2-level BACT limit)

Mike,

Attached is an example of the accounting process we envisioned when making our observations on the SLR BACT limit at Cargill-KCMO. It incorporates the 0.140 and 0.145 SLR limits proposed in the permit, but makes an additional adjustment to the BACT limit to account for higher SLR at production capacities greater than 90%. The effect of this approach is to establish a new BACT limit each month, weighted by production levels attained during the previous 12 months (or summed months during the first year). As long as the actual SLR is below the weighted BACT limit, Cargill would be in compliance. This analysis, while based on a 12-month look-back, could also be used by Cargill to determine any flexibility it might have in the months ahead.

I simplified the calculation (and possible concerns about the release of business confidential data when reporting compliance) by using the number of days above and below the 90% production capacity to weight the "effective" limit. The approach could be further refined by using monthly grind rates to weight the compliance limit, but this has the potential to require Cargill to release actual grind information. If Cargill isn't opposed to the release of this data, we would have no objection to weighting the two BACT limits with actual grind. It is also important to note that the 0.16 SLR used in the example spreadsheet is for illustration purposes only and is not a recommendation on what the appropriate limit might be. KCHD should work with Cargill to determine the appropriate upper bound SLR if deemed appropriate. If KCHD does not believe a higher SLR is appropriate at higher production levels, then we would defer to your judgment and would concur with your proposed BACT limits of .145 (in the first year) and 0.140 (thereafter).

Our previous comments were also not meant to imply that an annual cap on solvent use should be considered as BACT. To the contrary, we think it is important that Cargill minimize its emissions during all periods of operation and therefore offered a slight adjustment for those production thresholds where the SLR may be higher. The approach shown in the attached files assures that a BACT level of control is acheived over a variable range of operation.


Cargill-KCMO SLR Example Calculations.pdf

Cargill-KCMO SLR Example Results.pdf

Cargill-KCMO SLR Spreadsheet.xls

Please consider these comments as a supplement to our email dated August 7th and include in the permit record for the project.

If you have any questions, please let me know.

Thanks....

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For more information about the Region 7 Air Program, see....
http://www.epa.gov/region07/programs/artd/air/air.htm

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2		# operating days less than 90% capacity	sum of operating days less than 90% capacity	BACT limit at capacity less than 90%	# days greater than 90% capacity	sum of operating days greater than 90% capacity	BACT limit at capacity greater than 90%	# non-operating days	sum of non-operating days	"Effective" annual (rolled monthly) capacity-weighted BACT Limit		
3	Jan	25	25	0.145	2	2	0.16	4	4	0.146	In first year….	
4	Feb	22	47	0.145	4	6	0.16	2	6	0.147	sum the number of days from all prior months	
5	Mar	20	67	0.145	10	16	0.16	1	7	0.148		
6	Apr	18	85	0.145	10	26	0.16	2	9	0.149		
7	May	16	101	0.145	14	40	0.16	1	10	0.149		
8	Jun	14	115	0.145	15	55	0.16	1	11	0.150		
9	Jul	12	127	0.145	19	74	0.16	0	11	0.151		
10	Aug	10	137	0.145	21	95	0.16	0	11	0.151		
11	Sep	8	145	0.145	22	117	0.16	0	11	0.152		
12	Oct	8	153	0.145	23	140	0.16	0	11	0.152		
13	Nov	8	161	0.145	22	162	0.16	0	11	0.153		
14	Dec	6	167	0.145	25	187	0.16	0	11	0.153		
15	Jan	8	150	0.14	20	205	0.16	3	10	0.152	In the 2nd year and	
16	Feb	9	137	0.14	19	220	0.16	0	8	0.152	sum the number of days during the previous 12	
17	Mar	10	127	0.14	20	230	0.16	1	8	0.153		
18	Apr	9	118	0.14	18	238	0.16	3	9	0.153		
19	May	7	109	0.14	24	248	0.16	0	8	0.154		
20	Jun	6	101	0.14	24	257	0.16	0	7	0.154		
21	Jul	20	109	0.14	6	244	0.16	5	12	0.154		
22	Aug	15	114	0.14	15	238	0.16	1	13	0.154		
23	Sep	6	112	0.14	24	240	0.16	0	13	0.154		
24	Oct	5	109	0.14	25	242	0.16	1	14	0.154		
25	Nov	5	106	0.14	25	245	0.16	0	14	0.154		
26	Dec	4	104	0.14	26	246	0.16	1	15	0.154		
27												
28							* The 0.16 SLR is for			If the actual measured SLR is lower than the		
29							illustration purposes only.			"effective" annual (rolled monthly) capacity-weighted		
30										BACT limit, the source is in compliance.		
31												
32												
33												
34												
35												
36												
37												

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2		# operating days less than 90% capacity	sum of operating days less than 90% capacity	BACT limit at capacity less than 90%	# days greater than 90% capacity	sum of operating days greater than 90% capacity	BACT limit at capacity greater than 90%	# non-operating days	sum of non-operating days	"Effective" annual (rolled monthly) capacity-weighted BACT Limit		
3	Jan	25	=B3	0.145	2	=E3	0.16	=31-(B3+E3)	=H3	=((C3*D3)+(F3*G3))/(C3+F3)	In first year….	
4	Feb	22	=SUM(B3:B4)	0.145	4	=SUM(E3:E4)	0.16	=28-(B4+E4)	=SUM(H3:H4)	=((C4*D4)+(F4*G4))/(C4+F4)	sum the number of days from all prior months	
5	Mar	20	=SUM(B3:B5)	0.145	10	=SUM(E3:E5)	0.16	=31-(B5+E5)	=SUM(H3:H5)	=((C5*D5)+(F5*G5))/(C5+F5)		
6	Apr	18	=SUM(B3:B6)	0.145	10	=SUM(E3:E6)	0.16	=30-(B6+E6)	=SUM(H3:H6)	=((C6*D6)+(F6*G6))/(C6+F6)		
7	May	16	=SUM(B3:B7)	0.145	14	=SUM(E3:E7)	0.16	=31-(B7+E7)	=SUM(H3:H7)	=((C7*D7)+(F7*G7))/(C7+F7)		
8	Jun	14	=SUM(B3:B8)	0.145	15	=SUM(E3:E8)	0.16	=30-(B8+E8)	=SUM(H3:H8)	=((C8*D8)+(F8*G8))/(C8+F8)		
9	Jul	12	=SUM(B3:B9)	0.145	19	=SUM(E3:E9)	0.16	=31-(B9+E9)	=SUM(H3:H9)	=((C9*D9)+(F9*G9))/(C9+F9)		
10	Aug	10	=SUM(B3:B10)	0.145	21	=SUM(E3:E10)	0.16	=31-(B10+E10)	=SUM(H3:H10)	=((C10*D10)+(F10*G10))/(C10+F10)		
11	Sep	8	=SUM(B3:B11)	0.145	22	=SUM(E3:E11)	0.16	=30-(B11+E11)	=SUM(H3:H11)	=((C11*D11)+(F11*G11))/(C11+F11)		
12	Oct	8	=SUM(B3:B12)	0.145	23	=SUM(E3:E12)	0.16	=31-(B12+E12)	=SUM(H3:H12)	=((C12*D12)+(F12*G12))/(C12+F12)		
13	Nov	8	=SUM(B3:B13)	0.145	22	=SUM(E3:E13)	0.16	=30-(B13+E13)	=SUM(H3:H13)	=((C13*D13)+(F13*G13))/(C13+F13)		
14	Dec	6	=SUM(B3:B14)	0.145	25	=SUM(E3:E14)	0.16	=31-(B14+E14)	=SUM(H3:H14)	=((C14*D14)+(F14*G14))/(C14+F14)		
15	Jan	8	=SUM(B4:B15)	0.14	20	=SUM(E4:E15)	0.16	=31-(B15+E15)	=SUM(H4:H15)	=((C15*D15)+(F15*G15))/(C15+F15)	In the 2nd year and beyond..	
16	Feb	9	=SUM(B5:B16)	0.14	19	=SUM(E5:E16)	0.16	=28-(B16+E16)	=SUM(H5:H16)	=((C16*D16)+(F16*G16))/(C16+F16)	sum the number of days during the previous 12 months	
17	Mar	10	=SUM(B6:B17)	0.14	20	=SUM(E6:E17)	0.16	=31-(B17+E17)	=SUM(H6:H17)	=((C17*D17)+(F17*G17))/(C17+F17)		
18	Apr	9	=SUM(B7:B18)	0.14	18	=SUM(E7:E18)	0.16	=30-(B18+E18)	=SUM(H7:H18)	=((C18*D18)+(F18*G18))/(C18+F18)		
19	May	7	=SUM(B8:B19)	0.14	24	=SUM(E8:E19)	0.16	=31-(B19+E19)	=SUM(H8:H19)	=((C19*D19)+(F19*G19))/(C19+F19)		
20	Jun	6	=SUM(B9:B20)	0.14	24	=SUM(E9:E20)	0.16	=30-(B20+E20)	=SUM(H9:H20)	=((C20*D20)+(F20*G20))/(C20+F20)		
21	Jul	20	=SUM(B10:B21)	0.14	6	=SUM(E10:E21)	0.16	=31-(B21+E21)	=SUM(H10:H21)	=((C21*D21)+(F21*G21))/(C21+F21)		
22	Aug	15	=SUM(B11:B22)	0.14	15	=SUM(E11:E22)	0.16	=31-(B22+E22)	=SUM(H11:H22)	=((C22*D22)+(F22*G22))/(C22+F22)		
23	Sep	6	=SUM(B12:B23)	0.14	24	=SUM(E12:E23)	0.16	=30-(B23+E23)	=SUM(H12:H23)	=((C23*D23)+(F23*G23))/(C23+F23)		
24	Oct	5	=SUM(B13:B24)	0.14	25	=SUM(E13:E24)	0.16	=31-(B24+E24)	=SUM(H13:H24)	=((C24*D24)+(F24*G24))/(C24+F24)		
25	Nov	5	=SUM(B14:B25)	0.14	25	=SUM(E14:E25)	0.16	=30-(B25+E25)	=SUM(H14:H25)	=((C25*D25)+(F25*G25))/(C25+F25)		
26	Dec	4	=SUM(B15:B26)	0.14	26	=SUM(E15:E26)	0.16	=31-(B26+E26)	=SUM(H15:H26)	=((C26*D26)+(F26*G26))/(C26+F26)		
27												
28							* The 0.16 SLR is for			If the actual measured SLR is lower than the		
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