CONOCO

Interoffice Communication

To R. D. Gamblin

From J. H. McCulley

Date May 27, 1976

Subject VCM Plant Positions on the EPA VCM Standard Compliance Issues

There are five major issues involved in the plant's EPA VCM standard compliance project at present. The first, most basic issue is what should the design stream factor of the several compliance control devices be and how will the EPA standard be enforced in this area. The remaining four issues are concerned with the design of the incineration/HCl recovery process. Each issue is reviewed below and the plant's position explained.

1) Stream Factor

The last draft of the proposed EPA VCM standard states that the concentration of VCM in all exhaust gases discharged to the atmosphere is not to exceed 10 ppm with the exception of the oxy vent, relief valve discharges, and emissions from process equipment which has been purged below 2% VCM and opened to the atmosphere. There is no mention of an allowance for unabated emissions during periods when the emission control equipment has been shut down. Therefore, the standard requires, by omission, that a plant comply with the standard all the time. Obviously this is impossible. Even if the plant were shut down when a control system failed, the plant could be in non-compliance during the shutdown. For example, the plant would remain in non-compliance if the vent incineration system were shut down, since the light ends, tars, and EDC tanks would continue to vent VCM to the atmosphere at concentrations above 10 ppm. The EPA is thought to have purposely avoided the stream factor issue in order to avoid a performance definition on the required best available control technology. When Dave Kuhn asked an EPA employee involved in developing the standard what the EPA's position on control system stream factor would be, he was told that that question would not be resolved in the final issue of the standard and that the stream factor question would have to be interpreted by the enforcement arm of the EPA.

The question then becomes how will the standard be enforced by the EPA. A strict interpretation would require the immediate shut down of the VCM emitting process whenever a control system failed to comply with the standard or was shut down. The plant will have three VCM emission control systems: 1) the R-305 oxy vent cleanup reactor; 2) the vent incineration and HCl recovery system; and 3) a system to control VCM emissions from clearing spool pieces and sampling at the dock. A compliance failure or shut down of the first two systems would then require a plant shutdown. A failure of the dock system would require suspending the ship loading operation.

The plant's experience with R-305 would indicate that it may require catalyst replacement every eight months. With process modifications to allow rapid cooling of the spent catalyst bed and heating of the recharged bed, the total catalyst replacement operation may be shortened to 2 weeks. Shell's experience with R-305 indicates that the reactor catalyst should operate satisfactorily for at least nine months, allowing the catalyst to be recharged during the plant turnaround. The R-305 system stream factor can be improved substantially by installing a second R-305 reactor. The cost of the second R-305 is very roughly estimated to be $1MM.

CONOCO's survey to date of operators of chlorinated hydrocarbon incineration systems indicate that such systems have stream factors of 85 to 90% at best. The causes of system downtime are consistently reported to be downstream of the incinerator in the quench section, and materials and equipment problems in the HCl scrubbing equipment. PED has attempted to remedy these problem areas in their incineration/HCl recovery system design, but the net effect of these system refinements cannot be estimated. Therefore, the plant would expect the incineration/HCl recovery system stream factor to be in the 85 to 90% range. Perhaps as much as 50% of this downtime could be scheduled for plant turnarounds. The incineration/HCl recovery system's stream factor could be improved by sparing part or all of the process train. A complete spare train would cost in the neighborhood of $7MM.

At present the control system to be used to control the VCM ship loading spool piece and sampling emissions has not been defined. The system probably will involve several small carbon beds. In any case, the control system probably will not be costly in comparison to R-305 or the incineration system and can be designed with a higher degree of reliability or spared. At worst, failure of this control system would result in ship demurrage charges while repairs are made and lost plant production if the storage tanks were full.

The EPA's interpretation of the stream factor question will to some extent be influenced by the way other VCM producers choose to comply with the standard. Dave Kuhn and others are surveying the VCM industry in an attempt to determine this. To date we know that the new Borden plant will have two incinerators with one designed for vent incineration only and the other designed primarily for liquid incineration but having the capability to incinerate vents when the first incinerator is down. The Shell Norco plant already has a vent gas incinerator that can also burn both light ends and tars. When that incinerator is down, part if not all of the incinerator feed streams can be flared. An incinerator is being installed at the Shell Deer Park plant and we think it will burn both vents and liquids and have a flare backup. American Chemical has one vent incinerator for their VCM and ethyl chloride plant areas and are installing a second incinerator. Both incinerators will be capable of individually burning all the vent streams. BFG is flaring VCM rich vents at present. Their compliance plans are not known.