



Interoffice Communication

To R. D. Gamblin
From H. J. Neeld
Date November 14, 1979
Subject Ambient Air Monitoring Program for Calcasieu Parish

A recent computer ambient air modeling of all major air emission sources in Calcasieu Parish indicate that during worst case meteorological weather conditions with all sources emitting the maximum allowed by permit, two large areas north of the Lake Charles Chemical Complex violate National Ambient Air Quality Standards (NAAQS) with respect to SO₂. This model has been reviewed and massaged thoroughly to ensure correctness and to minimize the EPA's conservatism. These results have dictated that in place of No. 6 fuel oil as a primary fuel source for the LAB Plant and VCM expansion, Refinery fuel gas and No. 2 fuel oil be used, respectively. Due to the low sulfur content of these fuels, much of the modeling and monitoring requirements are not expected to be necessary to obtain PSD preconstruction permits. This strategy will not continue to be acceptable for all the projects in the ten-year plan which possibly could be built in Lake Charles. EPA defines an emission source as "any structure, building, facility, equipment, installation or operation (or combination thereof) which is located on one or more contiguous or adjacent properties and which is owned or operated by the same person (or by persons under common control)." This definition gives the regulator the latitude to lump LCCC into one source. This would require all changes in emissions since August 7, 1977, to be additive, requiring a full PSD review (monitoring and modeling) for the unit which made the total exceed 100 tons/year for any one pollutant. That could happen as early as the VCM Plant expansion, depending on the results of the stack sampling being done this week. In addition, the use of Refinery off gas, natural gas, and/or No. 2 fuel oil as our only fuel selection appears very restraining.

The solution to this problem lies in completing a one year ambient air monitoring program as a comparison to the earlier modeling predictions. If the model is correct and the area does violate NAAQS more than once a year, SO₂ offsets will be necessary in Lake Charles. If the monitoring indicates that no SO₂ violations occur, then the model will be calibrated to reflect the real world situation and permits could be secured for No. 6 fuel oil.

The monitoring program should begin as soon in the first quarter 1980 as possible. Assuming the results are favorable, this timing allows a No. 6 fuel oil permit to be secured close to startup of the LAB Plant. Three options are available to Conoco for organizing and financing the monitoring effort; an "in-house" project, a contractor service paid and directed by

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Conoco, or a contractor service paid and directed through an industrial cooperative effort. The following details the pros and cons of each:

In-House

The necessary equipment purchase, delivery, and trailer construction for the monitoring project is estimated by Ponca City to take approximately one year to complete at a cost of \$250,000. The program will be manpower intensive in terms of maintenance, quality control, data presentation, and supervision. The lead time necessary before startup postpones the switch to No. 6 fuel oil and possibly requires additional permits to be secured based on the low sulfur fuels for other new sources (i.e., Normal Paraffin expansion from 12M to 15M barrels per day and the HDPE Plant).

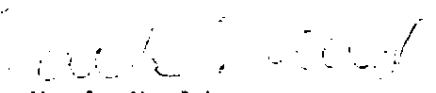
Contractor Service - Conoco Controlled

The time required to select a contractor, locate the monitors, and begin the project would be 90 days. The cost is estimated to be \$350,000. The program would be less labor intensive than in the first option. Full control over the project remains with Conoco, allowing timely corrections to the program as problems occur.

Contractor Service - Cooperative Effort

The cooperative effort monitoring program would be the same as the program for Conoco alone and, therefore, is estimated to cost \$350,000 in total. Four to seven area industries would be expected to cooperate, making Conoco's cost \$87,500 to \$50,000. The time required to select a contractor, locate the monitors, and begin the project is estimated to be 180 days. The control of the project is only partially with Conoco. Decisions, revisions, and problem resolutions are much more cumbersome and lengthy than would otherwise be. This in turn affects the length of time that a particular new source is dependent upon low sulfur fuels.

The recommended approach is for Conoco to select and control the contractor from start to finish. This is the most costly but direct route to the information required for a full PSD review which is an eventuality. There is some possibility of getting other companies involved in the cost at a later date due to their similar PSD requirements.


H. J. Neeld

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cc: RTF RHG JAD GLF

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TABLE I - PROJECT SUMMARY
OXY VENT GAS HYDROCARBON REDUCTION ALTERNATIVES
LAKE CHARLES VCM PLANT

I. HYDROCARBON EMISSIONS

COMPONENTS	1977 EIG	OXYGEN-BASED				OXYGEN-BASED	
	EMISSIONS	65% REDUCTION	85% REDUCTION	HYDROCARBON REDUCTION	HYDROCARBON REDUCTION	OXYCHLORINATION	OXYCHLORINATION
	TONS/YR	TONS/YR	% REMAIN	TONS/YR	% REDUCTION	TONS/YR	% REMAIN
CO	1,776	—	—	—	—	—	—
HCO	245	—	—	—	—	—	—
CO ₂	30	—	—	—	—	—	—
METHANE	172	—	—	—	—	—	—
ETHANE	20	—	1597/y remain	—	663/y remain	—	0/y remain
HYDROCARBONS TOTAL	4418	2871	65	3,755	85	4418	100
VCM	56	9	16	32	57	56	100
EDC	1,694	1,677	99	1,692	99	1,694	100
ETHYLENE	479	—	—	67	14	479	100
ETHYL CHLORIDE	2001	1,005	50	1,327	94	2001	100
OTHERS	188	180	96	137	73	188	100
H/C TOTALS	6,661	2871	—	3,755	—	4418	—

II. CAPITAL INVESTMENT (1981) \$1,790,000 \$2,060,000 \$2,873,000

III. ANNUAL OPERATING COST (EX
DEPRECIATION AND CAPITAL CHARGES) (\$49,800) (\$10,300) \$1,920,000

IV. PROJECT SCHEDULE (SEE NOTE 1) (SEE NOTE 1) (SEE NOTE 3)

A. ENGINEERING/DEVELOPMENT	5/79 - 5/81	5/79 - 5/81	8/79 - 6/81
B. PERFORMANCE EVALUATION OF SMALL OXYGEN-BASED PROCESS	1/80 - 8/80	1/80 - 8/80	1/80 - 8/80
C. PURCHASING	1/81 - 10/81	1/81 - 10/81	1/81 - 8/81
D. CONSTRUCTION	2/81 - 10/82	8/81 - 10/82	5/81 - 1/83
E. STARTUP	11/82 - 12/82 (SEE NOTE 2)	11/82 - 12/82 (SEE NOTE 2)	2/83 - 3/83

TABLE I (CONT.)

NOTES: 1. CONOCO WILL CONTINUE WITH DEVELOPMENT OF A DEFINITIVE PROCESS DESIGN AND INITIAL ESTIMATES FOR SOLVENT ABSORPTION. INITIATION OF THE DETAILED MECHANICAL DESIGN MAY BE DEFERRED UNTIL VIABILITY OF THE SHELL OXYGEN-BASED OXYGENATION RETROFITTING IS INDICATED. HOWEVER, ^{FOR} CONFIRMATION OF THIS PROCESS WOULD NOT BE POSSIBLE UNTIL SHELL HAD OPERATED THROUGH A COMPLETE 12 MONTH CATALYST CYCLE (UNTIL NOVEMBER OR DECEMBER, 1980 PRESUMING COMPLETION OF THE RETROFITTED PLANT IN JANUARY 1980), CONOCO WOULD ATTEMPT TO REEVALUATE ITS DECISION NO LATER THAN AUGUST 1980. PRESUMING THE RETROFITTING SCHEME DID NOT INDICATE SATISFACTORY PERFORMANCE, CONOCO WOULD COMMIT TO THE SOLVENT ABSORPTION PROCESS THROUGH INITIATION OF THE DETAILED MECHANICAL DESIGN WITH A CONTRACTOR BY SEPTEMBER 1, 1980. THIS SCHEDULE ALLOWS PURCHASING TO BEGIN BY JANUARY, 1981 AND CONSTRUCTION BY AUGUST, 1981. MECHANICAL COMPLETION IS EXPECTED BY NOVEMBER, 1982 WITH STARTUP OPERATIONS EXTENDING INTO DECEMBER, 1982. NORMAL PLANT OPERATION WOULD BE EXPECTED BY DECEMBER 31, 1982. TO ALLOW MORE TIME TO START UP AN ACHIEVE SMOOTH OPERATION, ENGINEERING MUST BE STARTED EARLIER THAN SEPT.

3. CONOCO HAS INVESTIGATED THE OXYGEN-BASED OXYGENATION RETROFITTING SCHEME IN AN OXYGEN MARKET FOR SEVERAL YEARS, AND CONTRACTED FOR A PRELIMINARY PROCESS DESIGN IN 1978. CONOCO WILL CONTINUE TO INVESTIGATE THE PROCESS AND CHEMICAL LICENSING ACTIVITIES IN PREPARATION FOR UPDATING THE DESIGN AND PREPARING A NEW ECONOMIC ANALYSIS. CONOCO WILL MONITOR SHELL'S OPERATION OF THEIR RETROFITTED PLANT FROM CONSTRUCTION COMPLETION IN JANUARY, 1980 AT LEAST THROUGH HALF OF A CATALYST CYCLE IN JULY, 1980. IT IS ESSENTIAL TO CONFIRM THAT NO SUBSTANTIAL CATALYST LIFE CYCLE REDUCTION AND NO MATERIAL CONVERSION LOSSES WILL OCCUR DUE TO THEIR MAJOR IMPACT ON OPERATING COSTS. ALTHOUGH IT IS DESIRABLE TO HAVE PERFORMANCE DATA FOR A FULL CATALYST PERFORMANCE CYCLE, THIS WOULD EXTEND THE DECISION DATE INTO ¹⁹⁸¹ NOVEMBER OR DECEMBER, 1980, OR AN ADDITIONAL 3-4 MONTHS, THEREFORE CONOCO WOULD MOVE

TABLE I (CONT.)
NOTES (CONT.)

3 (CONT). FOR AN IDEAL OCCASION ON REINITIATING ITS OXYCHLORINATION UNIT BY AUGUST 1980. PRESUMING THE PERFORMANCE EVALUATION AND ECONOMICS FOR SILVER-BASED OXYCHLORINATION YIELDED FAVORABLE RESULTS, CONGO COULD INITIATE STEPS CAUSING AN OXYGEN FACILITY TO BE DESIGNED, AND ALSO INITIATE ENGINEERING OF OXYCHLORINATION MODIFICATIONS. ENGINEERING IS EXPECTED TO BE SUFFICIENTLY ADVANCED BY MAY, 1981 TO ALLOW START OF CONSTRUCTION. THE NEW FACILITIES ARE EXPECTED TO BE MECHANICALLY COMPLETE BY FEBRUARY 1983 AND NORMAL OPERATION TO BEGIN IN APRIL 1983.

FOR SOLVENT ABSORPTION

2. THE FACULT SCHEDULE COULD BE SHORTENED SUCH THAT STARTUP OPERATIONS WOULD BE COMPLETED AT THE END OF AUGUST, 1982 IF MECHANICAL ENGINEERING WERE INITIATED IN SEPTEMBER, 1979. HOWEVER, THIS WOULD REQUIRE COMMITMENT OF \$350,000 TO AN ENGINEERING CONTRACTOR. (IN ADDITION TO CONGO'S INTERNAL ENGINEERING COSTS) SOME 12 MONTHS PRIOR TO KNOWLEDGE OF WHICH FUNDING WILL BE SECURED.

TABLE IV
OXY VENT GAS CLEANUP ALTERNATIVES
LAKE CHARLES VCM PLANT

UNION CARBIDE'S PURASIV HR

<u>I. Components</u>	<u>1977 EIQ Tons/Yr.</u>	<u>Hydrocarbon Reduction Tons/Yr.</u>	<u>% Red.</u>	<u>Remaining Emissions Tons/Yr.</u>
Carbon Monoxide	1776	-	-	1776
HCl	245	-	-	245
Cl ₂	29.9	-	-	29.9
Hydrocarbons Total	4418	3935.2	.89	482.8
VCM	55.8	55.8	.93	3.8
C ₂ H ₄	479	0	0	479
Ethyl Chloride	2001	2001	100	0
EDC	1694	1694	100	0
Others	188	188	100	0

II. Capital Investment (1981 Dollars)

\$1,600,000

III. Annual Operating Costs

(\$117,900)

IV. Project Schedule

A. Process Engineering/Development and Evaluation

7/79 - 7/80

B. Mechanical Design

9/80 - 1/81

C. Purchasing & Equipment Delivery

1/81 - 11/81

C. Construction

11/81 - 9/82

E. Startup

9/82 - 12/82

Piloting of Purasiv HR would need to begin in July of 1979 in order to give ample time to evaluate data, before beginning the process design. Union Carbide would provide the basic design. CONOCO would take this design and produce a definitive process design to meet CONOCO design standards. After a definitive cost estimate has been prepared, a decision could be made as late as September, 1980 to proceed with the Purasiv HR System. At this time the mechanical design would begin, allowing completion of this project and start up by December, 1982. This schedule allows minimal expenditure for this alternative before final commitment has been made.