



K. C. H. KCH
Tech. Serv. Div.
NOV 15 1982

Interoffice Communication

To W. J. Weisenborn, Westlake, Louisiana
From K. L. Kennedy, Ponca City, Oklahoma
Date November 12, 1982
Subject Heavy Crude Project--The Effect on Waste Water Treatment at the
Lake Charles Refinery

OFF _____
JHR _____
PJR _____
TEC _____
RSJ _____
FILE _____

The effect of the Heavy Crude Project on the Lake Charles Refinery effluent has been calculated. The new permit values are generally expected to increase by about 10 percent over the previously calculated values for the sour crude case as a result of running heavy crude. This assumes that the State continues to follow the National Best Practicable Technology Effluent Guidelines (BPT). The increased permit values result from slightly higher coker and vacuum distillation rates.

We have also calculated that BOD and suspended solids permit exceedances will likely occur after startup of the Sour Crude/Heavy Crude projects if no change is made to the present waste treatment system other than the planned addition of pretreatment flotation. Additional measures, such as removing the cooling tower blowdown from the waste water treatment system, will be required to prevent frequent permit exceedances.

With the Heavy Crude project, higher charge rates are expected for the Vacuum Distillation and Delayed Coking units. These higher rates will affect the calculated permit values using the BPT Effluent guidelines as shown in Table I.

Table II shows the predicted daily average BOD and suspended solids effluent values for the refinery Sour Crude/Heavy crude projects with and without cooling water bypass. With the existing treatment scheme, effluent quality will drop significantly, mainly due to increased desalter water from CTU No. 3. BOD loading to the activated sludge unit will rise while ASU performance will decline due to reduced residence time. It is likely that the effluent BOD levels will be even higher than our calculated values since the ASU residence time will be low enough to cause severe hydraulic overloading (13.5 hours). The total suspended solids (TSS) effluent values will also increase slightly due to increased flow through the final DAF unit. Permit exceedances for both BOD and suspended solids will probably occur. Of course, how quickly the exceedances occur after startup may depend on a variety of factors including organic loading variations, upsets in the process units, amount of storm water to treat, etc.

The effluent levels could be lowered to below permit values by changing to non-chromate treatment of the cooling water or by adding a chromate removal process before discharging the cooling tower blowdown directly. This relatively low capital cost alternative would reduce effluent BOD and TSS levels dramatically by lowering the flow rates to the ASU and DAF units. Bypassing only a portion of the cooling water would greatly reduce permit exceedances, although the effluent quality would not be as good as that shown in Table II.

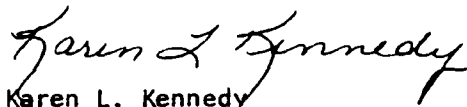
MCD 000002451

W. J. Weisenborn
Page 2

There may be other approaches to solving the problem although the cooling water bypass appears to be the most economically attractive approach.

We are willing to sit down with you to discuss the effluent problem and possible solutions at your convenience. We understand that you plan to go ahead and submit the Sour Crude NPDES permit application. The Heavy Crude application will follow shortly.

If you have any questions, please call.



Karen L. Kennedy
Process Engineer
Engineering Services Division
Process Engineering Department

ke
Enc

CC:
RGG:JSD:LES:KZH
P. W. Lashbrooke - Westlake
J. W. Leigh - Westlake
P. A. Madison - Westlake
M. K. Sternberg - Westlake

Approved  _____

File: EV-1192.16

MCD 000002452

TABLE 1

BEST PRACTICABLE TECHNOLOGY EFFLUENT GUIDELINES

HEAVY CRUDE PROJECT

LAKE CHARLES REFINERY

<u>Parameter</u>	<u>Daily Average, Lb/Day</u>	<u>Daily Maximum, Lb/Day</u>
BOD ₅	1,398	2,517
TSS	1,118	1,755
COD	9,787	18,862
Oil and Grease	407	763
Phenolic Compounds	9.0	18.6
Ammonia (as N)	756	1,663
Sulfide	7.3	16.3
Total Chromium	22	38
Hexavalent Chromium	1.4	3.1

Basis: The following projected production rates:

	<u>BPSD</u>
Atmospheric Distillation	164,000
Vacuum Distillation	69,000
Desalting	164,000
Fluid Catalytic Cracking	30,600
Thermal Cracking	11,800
Delayed Coking(1)	56,200

Notes:

1. From Heavy Crude Project Case No. 44.

KLK:ke

MCD 000002453

TABLE 11
EFFLUENT DAILY AVERAGE
BOD AND TSS LEVELS
HEAVY CRUDE PROJECT
LAKE CHARLES REFINERY

<u>Lb/Day</u>	<u>WITH EXISTING TREATMENT</u> <u>SCHEME (3)</u>		<u>WITH COOLING WATER BYPASS</u>	
	<u>50 Percent</u> <u>Effluent</u> <u>Number (1)</u>	<u>95 Percent</u> <u>Effluent</u> <u>Number (2)</u>	<u>50 Percent</u> <u>Effluent</u> <u>Number</u>	<u>95 Percent</u> <u>Effluent</u> <u>Number</u>
BOD	>755	>1,708	491	729
TSS	925	1,244	748	952

Notes:

1. The 50 percent effluent number (median value) corresponds to an effluent value which will be exceeded 50 percent of the time.
2. The 95 percent effluent number corresponds to an effluent value which will be exceeded 5 percent of the time. Effluent values are generally considered to be in compliance by EPA if the 95 percent effluent number is below the NPDES Daily Average permit value.
3. Existing treatment scheme with the new flotation facilities installed.

KLK:ke

MCD 000002454