UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

NOV 01 2013

REPLY TO THE ATTENTION OF:

Andrew Hall
Division of Air Pollution Control
Ohio Environmental Protection Agency
50 West Town Street, Suite 700
P.O. Box 1049
Columbus, Ohio 43216-1049

Dear Mr. Hall:

The U.S. Environmental Protection Agency has reviewed the draft Prevention of Significant Deterioration construction permit, permit number P0114527, for Lima Refining Company (LRC) in Lima, Ohio. To ensure that the source meets Clean Air Act requirements, that the permit will provide necessary information so that the basis of the permit decision is transparent and readily accessible to the public, and that the permit record provides adequate support for the decision, EPA has the following comments:

1. The cost analysis for selective catalytic reduction (SCR) as Best Available Control Technology (BACT), as provided on p. 5-10 of the permit application, has several discrepancies from the Office of Air Quality and Planning Standards Cost Control Manual (CCM) which is referenced in various sections as the basis for calculations. The CCM indicates that for SCR, there should be no additional labor costs, no additional supervisory labor, no property taxes, minimal insurance, insignificant administrative costs, and no overhead costs; however, the permit application's SCR analysis includes significant costs for all of these items. The CCM indicates that for an SCR, the equipment life should be 20 years, but the permit application uses 15 years. The cost of catalyst replacement incorrectly uses a cost recovery factor instead of a future worth factor. It is unclear why the permit application includes one percent of the cost of natural gas for the proposed heater toward the BACT cost analysis. Please provide an explanation for deviating from the recommendations in the CCM or reevaluate the SCR BACT consistent with the CCM recommendations.

2. The heater firing rate of 615.4 MMBtu/hr on p. 5-10 of the permit application is incorrect; it should be 624 MMBtu/hr as stated on p. 5-9.

3. According to the calculations in Appendix A, Table A-6, the NO_x baseline emissions for unit B004 is 0.029 lb/MMBtu, based on an average of all available stack tests and the final 2013 consent decree NO_x limit of 0.035 lb/MMBtu. However, the 0.035 lb/MMBtu limit was not in LRC's Title V permit until July

15, 2013 (permit no. P0113610). Prior to that, the Title V NO_x emission limit was 0.10 lb/MMBtu (permit no. P0086638, issued January 11, 2012). It would be more appropriate to use the latter number to calculate the NO_x baseline emissions so that LRC is not taking credit for emission reductions resulting from the consent decree limit. Please revise the calculations so that 0.10 lb/MMBtu is used instead of 0.035 lb/MMBtu.

4. The permit application states that the SCR cost analysis for NO_x is based on a baseline of 40 ppm that is required by New Source Performance Standards (NSPS) Subpart Ja. The cost analysis should not use 40 ppm as a baseline since it is required by NSPS; instead, the analysis should use 0.10 lb/MMBtu from Title V permit no. P0086638, issued on January 11, 2012. Please revise the cost analysis so that 0.10 lb/MMBtu is used instead of 40 ppm.

5. The NO_x BACT analysis for unit B004 on p. 5-8 of the permit application considers combustion controls (ultra low-NO_x burners, or ULNB) and the combination of ULNB with SCR. The BACT analysis should also consider SCR without ULNB.

6. The SCR cost effectiveness analysis on p. 5-10 of the permit application uses a power of 0.6 in its calculation for total capital investment. The "six-tenths-factor rule" is generally an oversimplification that should only be used in the absence of other information.[1] Please revise the cost capacity factor so that it accurately represents the equipment at LRC and provide justification for it or explain why no other information is available for calculating the cost capacity factor.

7. The permit application states on p. 1 that the nominal throughput crude capacity will not be increased, and p. 1-2 states that the reconstructed Vacuum Furnace (B001) will have roughly the same rated heat input. However, p. 2-8 states that the reconstructed Crude Distillation Unit II Heater (B004) will have a slightly larger capacity. Please explain the need for increasing the capacity for B004 when throughput crude capacity will remain the same.

8. The coker cycle time is being decreased from 19 hours to 12 hours, but the permit application does not mention what effect this will have on emissions. Please explain the effect that the decreased cycle time will affect emissions.

9. The permit application states on p. 1-3 that the new and existing sulfur recovery units (SRUs) will be equipped to allow oxygen enrichment and that oxygen enrichment is planned for use only as a backup when an SRU fails. However, the draft permit does not restrict oxygen enrichment to SRU failure incidents. Please explain why the draft permit does not limit the usage of oxygen enrichment.

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[1] Max S. Peters and Klaus D. Timmerhaus, Plant Design and Economics for Chemical Engineers (4th ed. 1991).

10. The permit application states on p. 4-33 that Linde Corporation, which will supply LRC with steam, hydrogen and oxygen, is not considered part of LRC. Linde is adjacent to the refinery but not owned or controlled by Husky LRC. Linde has customers besides LRC. Please provide us an estimate of how much of Linde's products go to LRC or other facilities owned or operated by LRC or Husky and how much Linde's emissions will increase as a result of LRC's Crude Oil Flexibility project.

11. A Leak Detection and Repair program (LDAR) is being required under NSPS Subpart GGGa for volatile organic compounds. Please include an analysis of using LDAR for the control of fugitive methane emissions from equipment leaks pertaining to the proposed new piping and emission units of the project.

12. The permit application on p. 1-4 and the calculations in Appendix A only account for the replacement flare's emissions with regard to the pilot and purging, stating that "The new and old units will operate under a balanced operation such that the [pressure] swings should not be as severe and the units will be able to better handle and treat the gas without flaring. As a result, process upset emissions at this flare are not anticipated to increase as a result of this project." EPA has objected to Title V refinery permits whose flaring emission calculations do not include emergency or malfunction situations. *See, In the Matter of BP Products North America, Inc., Whiting Business Unit,* Petition No. 089-25488-00453 (October 16, 2009). Please revise the calculations to include flaring emissions during emergencies and malfunctions or provide more detailed justification for omitting such calculations.

13. The draft permit has carbon dioxide (CO_2) as a surrogate for GHG emissions including GHG CO_2 BACT limits for several emission units. Even though CO_2 may make up the majority of the GHG emissions for this proposed project, the regulated pollutant is GHG not CO_2. Therefore, the GHG emission limits should be expressed in terms of CO_2 equivalent (CO_2e) so that they account for all GHGs. Please also clarify how compliance with each of the GHG emission limits will be demonstrated.

14. On p. 5-7 of the permit application, flue gas recirculation (FGR) is rejected as BACT due to "operational constraints and the high cost of the additional fan and ductwork." Please explain the operational constraints in detail and why they make FGR technically infeasible. Also, the fan and ductwork cost should be considered in the economic feasibility part of the analysis, not the technical feasibility part. Please address the cost effectiveness of the fan and ductwork in an economic feasibility analysis that is separate from the technical feasibility analysis.

15. On p. 5-8 of the permit application, selective noncatalytic reduction (SNCR) is rejected as BACT. The technical feasibility analysis states that "SNCR systems, in some instances, achieve approximately 40% reduction of NO_x but require very

specific temperature and residence time characteristics of the heater to be feasible." Please explain whether and to what extent the specific temperature and residence time requirements of SNCR make the technology infeasible. Also, the comparable emission reduction of other control technologies and the lack of SNCR on similar sources listed in the RACT/BACT/LAER Clearinghouse are not appropriate reasons to reject SNCR as BACT. Please omit these justifications for SNCR rejection from the analysis.

16. The only control technology mentioned in the refinery heater SO_2 BACT analysis on p. 5-14 of the permit application is methyl diethanolamine scrubbers for the removal of H_2S sulfur. Please explain what other control technologies have been considered. Also, there should be a technical feasibility and cost effective analysis specific to LRC for non-H_2S sulfur removal technologies. The current analysis, rather than providing this, mentions EPA's finding of such technologies to be prohibitively expensive in its NSPS Subpart Ja Regulatory Impact Analysis.

17. The modeling analysis for the new SRU utilizes EPA's policy for intermittent operating units. The policy, provided in EPA's March 1, 2011 memorandum titled "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard," is intended for sources that operate very infrequently, e.g., emergency generators, and are therefore not expected to contribute to the modeled design value. The application of the policy to the new SRU appears to result in modeling annualized actual emissions rather than allowable emissions. Please revise the modeling analysis so that it does not utilize the policy or provide quantitative operational data that justifies application of the policy to the new SRU.

18. The modeling for short-term National Ambient Air Quality Standards requires representative short-term emissions as described in 40 C.F.R. part 51, Appendix W, Table 8-2. Many of the modeled emission rates appear to be based on long-term averaged emissions. Representative short-term emissions should be used or further explanation and justification of the emissions should be provided.

19. The modeling analysis does not include an ozone analysis. NO_x is a precursor to ozone. 40 C.F.R. § 52.21(b)(50)(i). As NO_x emissions are above 40 tons per year, an ozone analysis is required. Ohio Administrative Code 3745-31-16(B).

20. The analysis modeled negative emissions of NO_2. Because the NO-to-NO_2 conversion approaches are screening techniques, they tend to overestimate the effects of negative emissions. An alternative approach may be available given the similarity of the before-and-after source characterizations. Please contact Randy Robsinson for information on possible alternative approaches.

21. Page 12 of the draft permit states that emission unit P040, the existing SRUs undergoing modification, is subject to NSPS Subpart J. Please determine whether

P040 is also subject to Subpart Ja and either include Subpart Ja as an applicable requirement in the permit or explain why P040 is not subject to Subpart Ja.

We appreciate the opportunity to provide comments on this draft permit. If you have any questions, please feel free to contact me or have your staff contact Kaushal Gupta, of my staff, at (312) 886-6803.

Sincerely,

Genevieve Damico

Genevieve Damico
Chief
Air Permits Section