

Environmental Integrity Project

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Turning the Clock Back on the Clean Air Act

ACCEPTING EPA'S CHALLENGE: COMPARING THE BUSH ADMINISTRATION'S
NEW SOURCE REVIEW LOOPHOLE TO REALITY

Executive Summary

The New Source Review (NSR) provisions of the Clean Air Act prohibit companies from expanding their oil refineries or other facilities in a way that increases pollution unless they apply for a permit and put on best available pollution controls. The Bush Administration wants to exempt companies from this requirement if emissions resulting from plant modifications do not rise above a plant's worst emission levels out of the last ten years. The Bush Administration insists that its loophole will not increase emissions, as common sense would otherwise dictate. The Administration also claims that it is impossible to quantify pollution increases under its plan and has challenged the environmental community to provide this analysis.

The Environmental Integrity Project took the challenge and found that pollution would in fact increase under the Administration's proposal. EIP commissioned Abt Associates, Inc., a consultant used by the U.S. Environmental Protection Agency, to determine whether two midwestern plants that recently qualified for NSR would have triggered NSR under the Bush worst-two-in-ten baseline. Abt found that the facilities would have escaped NSR, resulting in an increase in nitrogen oxide pollution of a combined total of 124.6 tons per year. The study also showed that controls placed on one of the plants as a result of triggering NSR reduced sulfur dioxide emissions as well – reductions that would not have been realized under the Bush plan. EIP sent the analyses to Dr. John Graham, the Administrator for the Office of Information and Regulatory Affairs, and urged him and the Administration to conduct a thorough analysis of the impacts of the proposed rule based on Abt's findings. That letter as well as Abt's analyses follow.

October 23, 2002

DELIVERED BY HAND AND FACSIMILE

Dr. John Graham
Administrator
Office of Information and Regulatory Affairs
Eisenhower Executive Office Building
Room 262
Washington, D.C. 20503

Dear Dr. Graham:

I understand that the Office of Management and Budget is preparing to release shortly a final rule that will make it easier to avoid the requirements of the Clean Air Act's New Source Review (NSR) program. The Administration has insisted in testimony before the U.S. Congress that broadening these exemptions will not increase air pollution and has stated publicly that it is impossible to show such an increase.¹

Recent analysis performed by Abt Associates Inc., a contractor for the U.S. Environmental Protection Agency (EPA), however, indicates that applying just one element of the final rule – one that would allow a facility to avoid NSR pollution controls for projects that did not raise emissions above their highest level within the past ten years – would have increased emissions of nitrogen oxides (NO_x) by a combined total of 124.6 tons per year at two industrial facilities in the Midwest. As explained in depth below and in the attached reports, the analysis indicates that had the Administration's final rule been in effect, NO_x emissions would have increased by 66.7 tons per year at Mobil's (now ExxonMobil's) Joliet, Illinois, refinery and by 57.9 tons per year at Nucor Steel's plant in Crawfordsville, Indiana. A closer reading suggests that the Administration's proposal also could have increased sulfur dioxide emissions at the ExxonMobil refinery by more than 200 tons annually.

As you know, NSR currently requires industrial plants located in attainment areas that are physically modified in a way that increases emissions of specific pollutants above

¹ Statement of Jeffrey Holmstead, Assistant Administrator for Air and Radiation, U.S. Environmental Protection Agency, made during a BNA webcast on New Source Review and EPA's Clear Skies Initiative (Bureau of National Affairs webcast, Sept. 17, 2002) (stating that EPA has "seen no analysis whatsoever from [the environmental community] to back up their claims that somehow [the final rule] is going to increase emissions. The reason is that there's no way you could do analysis that would show that.").

a minimum threshold (e.g., 40 tons for NO_x), to apply for permits and install best available control technology or “BACT.”² The first step in deciding whether NSR applies is determining the baseline of emissions against which any future increase resulting from the proposed plant modification must be measured. At present, for refineries, steel mills, and other industrial plants (in other words, all facilities except utilities), the baseline is usually the plant-wide average of the emission levels for the two most recent years. Companies are permitted to substitute emissions data from earlier years only if they can show that the more recent data is not representative of normal plant operations.³

The Administration’s final rule, as explained in EPA’s “New Source Review: Recommendations” released on June 13, 2002, would allow companies to elect the average of the two worst polluting years out of the past ten, irrespective of whether they were typical of plant operations today. For example, suppose a refinery averaged annual emissions of 1,000 tons of NO_x in 2001 and 2002, but 2,000 tons per year in 1993 and 1994. The final rule would allow the refinery to increase its NO_x emissions by at least 1,000 tons in 2003 without triggering NSR or having to apply pollution controls because the new total of 2,000 tons per year would not exceed emission levels reported ten years ago. In fact, the company could release NO_x emissions up to 2,039 tons, as that would not exceed the ten-year-old pollution levels by the 40 tons required to trigger NSR.

The Administration has insisted, without offering evidence, that “other requirements” of the law would prevent such increases even if NSR no longer applied. The Abt report tests this assumption by examining what would have happened if the Administration’s ten-year baseline had been in effect when ExxonMobil and Nucor submitted applications for permit modifications.

ExxonMobil’s Joliet, Illinois, refinery proposed in 1997 to relocate a crude unit preheater, in part to increase production – or “debottleneck” – several downstream units. The Illinois Environmental Protection Agency (the “Illinois EPA”) used emissions data from 1995 and 1996 to establish a plant-wide annual emissions baseline of 1,693.4 tons. The Illinois EPA then calculated that the project would increase emissions by over 108.7 tons per year at the preheater, and another 324.7 tons per year at downstream units. Because this was well over the forty-ton threshold for NSR permitting, ExxonMobil was required to install low-NO_x burners at the modified unit (the preheater), eliminating 66.7 of the 108.7 tons expected annually for the new project.

According to EPA’s emission inventory, the ExxonMobil refinery released an average of over 5,000 tons of NO_x annually in 1990 and 1991. Had the refinery been

² See 40 C.F.R. § 52.21(i) (listing permit requirements for major modifications in attainment areas); 40 C.F.R. § 52.21(b)(23)(i) (defining significant increases for criteria pollutants). Significant increases for the criteria pollutants relevant to the Abt analysis include 40 tons per year for NO_x; 40 tons per year for volatile organic compounds (VOCs); 25 tons per year for particulate matter (“PM”); and 15 tons per year for particulate matter at or below 10 microns (“PM₁₀”). 40 C.F.R. § 52.21(b)(23)(i).

³ 40 C.F.R. § 52.21(b)(21)(ii).

able to use this baseline in 1997, as EPA's final rule would allow, the modification would not have registered as an increase because actual emissions after the project (2176.8 tons per year including the proposed increases), would have been much less than the 1990-91 average of 5,280 tons per year. We were unable to identify any other requirements that would have limited NO_x emissions in the absence of NSR.⁴

In the second case, a Nucor Steel mill in Montgomery County, Indiana, installed a series of new burners in a preheater and radiant tube section of a galvanizing line. The Indiana Department of Environmental Management (IDEM) calculated an emissions baseline of 251.7 tons of NO_x based on 2000 data. Because the new burners were expected to increase NO_x emissions from the plant by 83.9 tons per year, the project triggered NSR. As a consequence, the plant was required to install BACT, which included selective catalytic reduction/non-selective catalytic reduction ("SCR/NSCR" or "SCR") controls, eliminating 57.9 tons per year of the planned increase and reducing emissions by 69%.⁵ It is unclear whether IDEM treated the burner installation as a new project or modification of an existing unit. Regardless, the Administration's final rule would authorize plantwide applicability limits (PALs) that would allow companies to increase emissions, whether through new units or modifications, so long as ten-year-old pollution levels are not exceeded.

According to EPA's National Emissions Inventory, NO_x emissions from the Nucor plant between 1990 and 1991 averaged 528 tons – nearly twice the amount estimated by IDEM for 2000. Had Nucor been able to take advantage of this earlier, higher baseline, as EPA's final rule would allow, it could have avoided NSR and pollution controls, because the total after the increase (334.7 tons per year, or 251.7 plus 83 tons per year) would have been less than the historic baseline of 528 tons per year. As a consequence, Nucor could have increased NO_x pollution up to 567.8 tons per year⁶ without triggering NSR. Again, Abt was unable to identify any other standards that would have limited pollution in the absence of NSR.

Closer analysis suggests that the ExxonMobil preheater project in Joliet also might have been able to increase sulfur dioxide emissions by another 200 tons if allowed to return to ten-year old emission levels. Without pollution controls, the preheater project would have increased particulate matter at or below 10 microns ("PM₁₀") emissions by more than 100 tons above the 1995 to 1996 baseline of 418.5, or well above the 15 tons

⁴ In fact, NO_x emissions at the debottlenecked units increased by more than 300 tons as a result of EPA's policy to limit NSR controls only to the unit that is physically modified – the preheater in the case of the ExxonMobil Joliet refinery.

⁵ IDEM required SCR as the control technology because Nucor had earlier failed to obtain an NSR permit as required for this modification. The SCR technology used may reflect some additional improvement beyond other pollution control options that IDEM would normally consider sufficient to meet BACT requirements.

⁶ 567.8 tons per year represents the highest emissions recorded in the National Emissions Inventory in the preceding 10-year period plus the 39-ton de minimus increase permitted under the Clean Air Act.

per year needed to trigger NSR permit and control requirements.⁷ As a result, the refinery was required to use clean-burning natural gas and low sulfur fuels at the preheater, reducing not only PM₁₀ emissions, but eliminating 200 tons of sulfur dioxide emissions every year.

EPA's National Emissions Inventory data for the ExxonMobil Joliet plant shows that PM₁₀ emissions were significantly higher in 1990 and 1991, averaging 458.5 tons per year. No data for prior years is available; however, EPA emissions data shows a sharp drop in PM₁₀ emissions between the early and mid 1990's. Illinois EPA's estimates of PM₁₀ emissions in 1995 and 1996 were significantly higher than the amounts reported in EPA's inventory. If Illinois EPA's analysis of 1995 and 1996 emissions is based on more accurate monitoring data, it is possible that the same methodology would result in proportionately higher emissions in 1990 and 1991 relative to the amounts EPA reported. In such a case, the higher baseline might have allowed ExxonMobil to avoid NSR entirely, because the increase in PM₁₀ emissions associated with the 1997 preheater project would not have caused the plant to exceed the highest levels of emissions within the past ten years. By avoiding NSR for PM₁₀, the ExxonMobil refinery might not have been required to use clean-burning fuels, and sulfur dioxide would have increased 200 tons annually.

The attached analysis is based on a review of state files, EPA and state emissions inventories, and conversations with state permit writers. The analysis found that EPA's National Emissions Inventory data differs substantially from state emissions data for reasons that were difficult to determine in the time allowed for research. The uneven quality of the government's own data make it more likely that overworked state permit writers will lack any objective basis for challenging ten-year-old emission estimates that may be inflated by companies seeking to avoid NSR.

⁷ Illinois EPA required BACT controls for all PM emissions. PM₁₀ emissions, however, accounted for 90% of total PM emissions in 1996; it is reasonable to infer that that ratio would remain constant for earlier years.

Nevertheless, the research is consistent with trends showing that emissions from industrial sources have gradually declined in the last ten years. That in turn suggests that allowing companies to “borrow” emissions from a decade ago to avoid pollution control requirements will make the air dirtier, not cleaner. If the Administration wants to refute this hypothesis, it can do so by examining NSR permitting decisions made by numerous states over the past several years, and by asking how the result would change under the Administration’s proposed shift of the baseline for counting emissions. We trust you will take the time to complete that analysis before publishing the final rule.

Sincerely,

Tatjana Vujic
Staff Attorney
Environmental Integrity Project

attachments

cc: Senator James M. Jeffords, Chair, Senate Environment and Public Works Committee
Senator Joseph I. Lieberman, Chair, Senate Governmental Affairs Committee
Senator Patrick J. Leahy, Chair, Senate Judiciary Committee
Senator Robert C. Smith, Ranking Member, Senate Environment and Public Works Committee
Senator Fred Thompson, Ranking Member, Senate Governmental Affairs Committee
Senator Orrin G. Hatch, Ranking Member, Senate Judiciary Committee
Senator John R. Edwards
The Honorable Christine Todd Whitman, Administrator, U.S. EPA
Jeffrey Holmstead, Assistant Administrator, Air and Radiation, U.S. EPA

Analysis of the Effect of Alternate Baselines for Clean Air Act New Source Review: Nucor Steel - Crawfordsville, Indiana



Abt Associates Inc.

Prepared upon the request of the Environmental Integrity Project October 21, 2002

BACKGROUND:

The Administration has proposed allowing companies to use the highest level of emissions in the past 10 years in baseline analyses to determine whether any given project would result increase emissions above the PSD threshold.

FACILITY AND PERMIT INFORMATION:

Permittee: Nucor Steel

Permit No.: 107-14297-00038

Issuance Date: June 6, 2002

Location: Montgomery County, Indiana

OVERVIEW OF FINDINGS:

In 1995, Nucor Steel installed several burners as part of a major modification project. Without any controls, this installation would have resulted in the emission of an additional 83.9 tons/year of nitrogen oxides (NO_x). Because the expected increase in NO_x emissions for this project exceeded the Clean Air Act's significance threshold of 40 tons/year, the project was deemed a major modification and the Indiana Department of Environmental Management (IDEM) required use of Best Available Control Technology (BACT) on burners in the preheat and radiant tube sections of the galvanizing line. The selected BACT for the preheater was low-NO_x natural gas-fired burners employing good combustion. Because these units were installed as part of a major PSD construction project, but not included in the original permit, Nucor was considered to be in non-compliance. An Agreed Order with IDEM required the installation of a catalytic reduction system to achieve supplemental NO_x reductions beyond those required for BACT. In total, these controls reduced emissions by 69 percent, from 83.9 tons/year down to 26 tons/year.

IDEM considered the modification as new construction. In such cases, IDEM does not use past actual emissions of the plant to determine net increases. However, if the increase in emissions was calculated by subtracting plant-level baseline emissions from future potential emissions, selection of alternative baseline years could have altered the BACT analysis and resulting permit. The National Emissions Inventory (NEI) shows that use of a baseline year prior to 1996 may have resulted in a BACT analysis determination that the project would result in no net NO_x increases. According to the NEI, the highest facility-wide NO_x emissions in the 10 years preceding the permit was 528 tons/year, significantly greater than the year 2000 baseline of 251.7 tons/year and even the potential plant emissions following modifications with no controls (335.6 ton/year).

FACILITY AND PERMIT INFORMATION:

Permittee: Nucor Steel

Permit No.: 107-14297-00038

Issuance Date: June 6, 2002

Location: Montgomery County, Indiana

Source Description: Nucor Steel is a steel mill that produces carbon hot rolled, floor plate, pickled, cold rolled, and galvanized steel coils, and stainless hot rolled, pickled, and cold rolled sheet steel coils. They have an annual capacity of 1,800,000 tons of hot-rolled, cold rolled and galvanized products, and serve a broad range of customers including service centers/processors, pipe and tube, construction, mining, electrical and others.

In 1995, Nucor installed several burners as part of a pickle line construction project. However, Nucor had failed to obtain permits for these particular burner units and so was considered to be in non-compliance until this permit was issued in 2002. The modification described in this permit was required to be reviewed under PSD (Prevention of Significant Deterioration) because the original construction permit was a PSD modification, and these burners are considered part of this initial PSD modification.

Attainment/Non-Attainment Status: Montgomery County is designated as attainment for all criteria pollutants.

Units Subject to Permit

- 36 main burners and 3 auxiliary burners in preheat furnace section of galvanizing line ("Preheat")
- 44 burners in radiant tubing section ("Radiant Tube")
- 1 auxiliary burner in alkaline cleaning section ("Alkaline Cleaning")
- 2 auxiliary burners in strip dryer section ("Strip Dryer")
- 4 auxiliary burners in the pot roll heater section ("Pot Roll Heater")
- 2 emergency burners in the zinc pot section ("Zinc Pot")
- 2 auxiliary burners in the preheat open end burners section ("Preheat Open End")

Determination of Major Modification Significant Levels

The Technical Support Document (TSD) reports emissions for the entire facility as having emissions greater than 100 tons/year for criteria pollutants (as shown in the table below). IDEM supplied the actual values used, the year 2000 emissions from the Indiana Air Emission Summary database. The TSD states that the existing source is a major stationary source for PSD because an attainment regulated pollutant is emitted at a rate exceeding threshold levels.

The burners were installed in 1995 as part of a modification that was major for PSD, but the company never obtained a permit for them. Therefore, these installations were considered a major

modification for PSD and were reviewed as such.

Emissions, based on 8,760 hours of operation per year at rated capacity and/or as otherwise limited (tons per year)					
Pollutant	Baseline Plant Emissions (as provided in TSD)	Baseline Plant Emissions, 2000 (as provided by permit writer)*	Emissions of New Construction/Modification - before BACT	Major PSD NSR Threshold	Emissions of New Construction/Modification - after BACT
PM	>100	N/A	1.3	15	1.3
PM ₁₀	>100	165	3.3	15	3.3
SO ₂	>100	145	0.2	40	0.2
VOC	>40**	54	1.9	40	1.9
CO	>100	616	29.6	100	29.6
NO _x	>100	252	83.9	40 (exceeded)	26

*Although not given in the TSD, IDEM provided these values via e-mail, October 3, 2002, reporting that they are the values he used in writing the permit. Values are from the Indiana Air Emission Summary Database.

**The TSD listed this value as ">100 "; the revised corrected value according to IDEM is reported in the table above.

Years Used to Calculate Past Actual Emissions

IDEM used only the 2000 past actual emissions in determining that the source was a major stationary source PSD, although he noted that the actual emissions data from the previous two years of emissions inventories are typically used by IDEM to determine PSD applicability to modifications.

BACT Requirements

IDEM's BACT Analysis determined that due to the small amounts of emissions, the application of add-on technologies to control CO, VOC, PM₁₀ and SO₂ was considered impractical and was precluded from further consideration. It is unclear as to why these pollutants were even discussed, as their emissions levels are below PSD thresholds.

BACT Requirements, by Pollutant		
Pollutant	BACT Requirement	Unit
PM	none	N/A
PM ₁₀	none	N/A
SO ₂	none	N/A
VOC	none	N/A
CO	none	N/A
NO _x	low-NOx natural gas-fired burners employing good combustion	Preheat and Radiant Tube sections

Other Permit Conditions That Would Limit Emissions Absent PSD NSR (BACT) Controls

Because this permit covers previously non-compliant or unpermitted units, it appears that there was an "Agreed Order" between the company and IDEM, in which the company agreed to install a selective catalytic reduction/non-selective catalytic reduction (SCR/NSCR) system to achieve supplemental NOx reductions on the preheat and radiant tube sections. These supplemental reductions are beyond those required for BACT. The post-BACT emissions values for NOx include SCR/NSCR controls.

Effect of Controls on Emissions

Appendix A of the permit's Technical Support Document provides calculations of the emissions of the new units before and after controls. Differences in NO_x emissions related to BACT controls are highlighted.

Potential Emissions Before and After Controls		
Pollutant	Before Controls (tons/yr)	After Controls (tons/yr)
PM	0.7	0.7
PM ₁₀	2.7	2.7
SO ₂	0.2	0.2
VOC	1.9	1.9
CO	29.6	29.6
NO _x	83.9	26

Findings

- EPA's National Emissions Inventory indicates that earlier year emissions of NO_x are over 3.5 times the 1996-1997 emissions. Use of earlier baseline years as representative of past actuals for NO_x might have resulted in a determination that:
 - the modification project would not increase NO_x emissions above the CAA threshold,
 - the construction was not major modification; and
 - BACT controls would not be required for NO_x control.
- The documentation did not establish definitively how it is that the NEI facility emissions do not match the past actual emissions in the Indiana Air Emissions Data, which were referenced in the documentation supporting the permit.

Emissions Inventory Analysis

Emissions inventory data from two sources is shown. The first table lists data as provided by the EPA, from the federal emissions inventory data. The second table lists Indiana Air Emissions Summary Data. This is the data source that the permit writers appear to use in their analysis. Inconsistencies between the two sources are not understood, but trends are similar for NOx.

Emissions Inventory Data from U.S. EPA (tons per year)										
Pollutant	1990 Facility Emissions	1991 Facility Emissions	1992 Facility Emissions	1993 Facility Emissions	1994 Facility Emissions	1995 Facility Emissions	1996 Facility Emissions	1997 Facility Emissions	1998 Facility Emissions	1999 Facility Emissions
PM ₁₀	642.3	642.3	642.3	642.3	642.3	642.3	68.4	74.4	74.9	74.5
SO ₂	307	307	307	307	307	307	158	172	173	172
VOC	151.4	151	151.4	151.4	151.4	151.4	8.6	9.4	9.4	9.4
CO	0	0	0	0	0	0	709	772.6	778.5	773.6
NOx	528.8	528.8	528.8	528.8	528.8	528.8	136.6	147.4	147.6	148

Indiana's emissions reporting rule, 326IAC2-6, requires air emission sources to report their actual emissions of certain pollutants to IDEM. This information is posted on the IDEM website (only years 1996-2000 are available).

Indiana Air Emission Summary Data 1996-2000 (tons per year)					
Pollutant	1996 Facility Emissions	1997 Facility Emissions	1998 Facility Emissions	1999 Facility Emissions	2000 Facility Emissions*
PM ₁₀	2.1	133.7	139.5	162.5	165.1
SO ₂	1,113.2	254.7	268.1	139.3	144.5
VOC	6.86	48.1	50.4	52.3	53.7
CO	28,643.2	538.4	566.1	601.4	616.2
NO ₂	198.4	229.5	221.4	272.9	251.7

*used in permit as baseline plant emissions

Information Sources:

Indiana Department of Environmental Management Office of Air Quality. Significant Source Modification Permit for Nucor Steel. Permit No. 107-14297-00038. Issued June 6, 2002. Paul Dubenetzky, Branch Chief.

Gurinder Saini, Indiana Department of Environmental Management, Air Permits Branch. Communication via telephone and e-mail, September 16 - October 17, 2002. (regarding permit details).

Joanne Smiddie-Brush, Indiana Department of Environmental Management, Air Permits Branch. Communication via e-mail and telephone, September 12-16, 2002 (regarding availability of IN permits)

Emissions Inventory Data for 1990-1999. Data files provided by Thomas McMullen, EPA Emission Factor and Inventory Group, September 9 - 17, 2002.

Indiana Department of Environmental Management. Indiana Air Emission Summary Data 1996-2000. <<http://www.in.gov/idem/air/emissionsdata/>> Site visited October 3, 2002.

Nucor Steel Crawfordsville, Indiana webpage. <<http://www.ns-ind.com/shtws/smwpsdesi.nsf/Crawfordsville!OpenForm>> Site visited on October 3, 2002.

Abt Associates Inc. Contact Information:

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Analysis of the Effect of Alternate Baselines for CAA Prevention of Significant Deterioration New Source Review: Mobil - Joliet, Illinois



Abt Associates Inc.

Prepared upon the request of the Environmental Integrity Project October 21, 2002

BACKGROUND:

The Administration has proposed allowing companies to use the highest level of emissions in the past 10 years in baseline analyses to determine whether any given project would result increase emissions above the PSD threshold.

FACILITY AND PERMIT INFORMATION:

Permittee: Mobil Oil Corporation

Application Number: 97030078

Permit No.: 1978000AAA

Issuance Date: February 5, 1999

Location: Will County, Illinois

OVERVIEW OF FINDINGS:

In 1997, Mobil, now ExxonMobil, proposed to relocate and restart an idle process heater as a crude unit preheater at its Joliet, IL refinery. This modification increased the flow of crude oil into the crude unit, thereby increasing overall production at the plant. The preheater would have resulted in an additional 108.7 tons per year of nitrogen oxide (NOx) from the preheater, and another 398 tons/year from downstream units as a result of debottlenecking in the crude unit. For this project, baseline plant emissions of NOx were based on the facility-wide average emissions of 1,693 tons/year for the two years 1995 and 1996. Because the expected increase in NOx emissions at the crude preheater unit exceeded the Clean Air Act's significance threshold of 40 tons/year, the project was deemed a major modification and the Illinois Environmental Protection Agency required use of Best Available Control Technology (BACT) on the preheater. The selected BACT for the preheater was low-NOX burners, which reduced emissions by 61 percent, from 108.7 tons/year down to 42 tons/year.

In this case, the use of alternative, earlier, baseline years would have changed several aspects of the BACT analysis and resulting permit. According to the National Emissions Inventory, the highest facility-wide emissions in the 10 years preceding the project was 5,000 tons in 1991, significantly greater than the 1,693 ton/year baseline using in the BACT analysis. Under the Administration's proposal, selection of earlier baseline years and creditable offsets, the crude unit preheater ("CUP") project would not have triggered an increase in NOx emissions, the company would not have been required to install low-NOx burners, and NOx emissions would have increased 66.7 tons/years over the permitted NOx limit for the unit. Similarly, use of an earlier baseline for PM might have avoided BACT controls for PM along with associated co-control reductions of 204 tons/year of SO₂.

FACILITY AND PERMIT INFORMATION:**Permittee:** Mobil Oil Corporation**Application Number:** 97030078**Permit No.:** 1978000AAA**Issuance Date:** February 5, 1999**Location:** Will County, Illinois

Facility Description: Mobil Oil Corporation operates a 1,200-acre petroleum refinery producing more than 8 million gallons a day of gasoline and diesel fuel for the Midwest market.

Attainment/Non-Attainment Status: Will County, IL is in attainment for all criteria air pollutants except ground-level ozone. Additional controls for VOCs and NOx are typically required in areas of ozone nonattainment.

Units Subject to Permit

This permit is for:

- relocation and operation of an existing idle process heater for use in de-bottlenecking their crude unit.

Determination of Major Modification Significant Levels

The determination of the need for PSD review is based on a baseline of actual emissions from the entire source prior to the current PSD NSR. This is broken out between the crude unit preheater (CUP) project and the facility emissions used to determine the applicability of PSD NSR.

Table 1. Existing Source Emissions and Potential Emissions

Pollutant	Baseline Plant Emissions (tons/yr)*	Increased Emissions of CUP w/o BACT (tons/yr)**	Prior 5-year Project Offsets (tons/year)***	Net Emissions Change (tons/year)	Major PSD NSR Threshold (tons/yr)
PM	461.6	123.7	9.3	133.6	25 (above)
PM ₁₀	418.5	116.9	10.1	127.0	15 (above)
SO ₂	27,010.4	1,063.4	-1,126	-62.6	40
VOC	72.9	11.5	-56.2	-44.7	40****
CO	2,835.3	84.5	0	84.5	100
NO _x	1,693.4	433.4	4.9	438.3	40 (above)****

* From application.

** From application. Increases from other units are associated with increased production associated with the de-bottlenecking of the crude unit.

*** Includes past project increases and reductions recognized in the permit.

**** Facility is located in area of non-attainment for ozone.

The application, permit and supporting documentation provided by IEPA do not mention anything related to ozone nonattainment status triggering LAER controls for ozone precursors above the significance threshold (in this case, NOx).

Years Used to Calculate Past Actual Emissions

The baseline numbers are based on the average of past actuals from 1995 and 1996 for all pollutants except for SO₂ for which 1989-1990 average was deemed representative (documented in Attachment 2 of the permit and permitting correspondence).

BACT Requirements

Following the Illinois Environmental Protection Agency's (IEPA) review of PSD NSR thresholds for a area of ozone non-attainment, it was determined that BACT for NO_x and particulate matter was required. These requirements are summarized as follows:

BACT Requirements, by Pollutant		
Pollutant	BACT Requirement	Unit
PM	Use of process gas+ low sulfur fuel oil as supplemental fuel = "representative as BACT"	Crude Unit Feed Preheater
PM ₁₀	none	
SO ₂	none	
VOC	none	
CO	none	
NO _x	low-NO _x burners	Crude Unit Feed Preheater

Effect of BACT on Emissions of Modified/New Unit

An appendix to the permit Technical Support Document provides calculations of the emissions of the new units only before and after controls. Application provided information on potential emissions of preheater prior to BACT controls. These number are for the preheater only and do not include affect on other units (none) or production-related increases.

Pollutant Emissions for Crude Unit Preheater Before and After Controls			
Pollutant	Potential Emissions Absent BACT Controls (tons/yr)	Potential Emissions with BACT Controls (tons/yr)	BACT Reductions (tons/year, percent reduction)
PM	20.1	4.5	-15.6 (78%)
PM ₁₀	13.4	3.9	-9.5 (71%)
SO ₂	254.6	50.4	-204.2 (80%)
VOC	2.8	2.9	--
CO	19.1	19.1	--
NO _x	108.7	42.0	-66.7 (61%)

Other Permit Conditions That Would Limit Emissions Absent PSD NSR (BACT) Controls

Page 10 of the application identifies a number of other requirements including but not limited to:

- State Emissions Standards (particulate matter, SO₂, and CO) for the relocated heater
- NESHAPs for petroleum oil refineries, including fugitive emissions controls for VOCs

Findings

- EPA's National Emissions Inventory indicates that earlier year (1991) emissions of NO_x are 50 percent greater than the 1995-1996 emissions, the years used for past actuals in the BACT analysis. Use of an alternative, earlier baseline year (1991) rather than the immediately preceding two years of 1995-1996 as representative of past actuals for NO_x might have resulted in a determination that:
 - the CUP project would not increase NO_x emissions above the CAA threshold,
 - the construction was not major modification; and
 - BACT controls would not be required for NO_x control.
- Use of any year except the selected years of 1989-1990 as representative of past actuals for SO₂ would have resulted in a determination that:
 - the CUP project would result in SO₂ emissions increase above the CAA threshold, the construction was a major modification; and
 - BACT controls would be required for SO₂ controlAttachment 2 to the permit provided justification for excluding years 1991-1995 but single one-year periods or two non-successive periods of representative operations could have been used.
- Assuming that PM and PM₁₀ emissions are generated in proportion and in the same proportion over time, the NEI indicates that 1990 emissions are 50 percent greater than 1995-1996 emissions. If so, use of an alternative baseline from the prior ten years as representative of past actuals for PM might have resulted in a determination that:
 - the CUP project would not have exceeded the PM threshold,
 - BACT controls for PM would not have been required, and
 - if BACT were not required, there might be no co-control reductions (204 tons/year) of SO₂.
- The facility is located in an ozone non-attainment area yet there is no mention of NO_x as an ozone precursor and only BACT control options were considered for the control of NO_x. In addition, LAER controls were not considered in the permit application and production-related NO_x increases (324.3 tons/year) are not subject to any controls. According to IEPA, at the time of the application, NO_x sources in this area were deemed not to be ozone precursors.
- The BACT analysis indicates that past actuals are often calculated values based on emission factors and technical specifications applied to known operating parameters, such as throughput or hours of operation, rather than measured emissions. The documentation did not establish definitively how it is that the NEI facility emissions do not match the past actual emissions presented in the permit. Only SO₂ emissions were within 10% of the NEI values.

Emissions Inventory Analysis

Emissions Analysis of Modification and Controls (all units in tons/year)									
	A	B	C	D	E	F	G	H*	I
Pollutant	1990 Facility Emissions	1991 Facility Emissions	1992 Facility Emissions	1993 Facility Emissions	1994 Facility Emissions	1995 Facility Emissions	1996 Facility Emissions	Past Actual Facility Emissions -- in Permit	Facility Emissions Increases w/o BACT Controls + prod. increases
PM	NA	NA	NA	NA	NA	NA	NA	461.6	123.7
PM ₁₀	462	455	308	308	308	308	312	418.5	116.9
SO ₂	26,166	26,071	24,706	24,701	24,706	24,706	24,829	27,010.4	1,063.4
VOC		1,007	1,069	1,069	1,069	1,069	1,052	72.9**	11.5
CO		530	594	594	594	594	607	2,835.3	84.5
NO _x		5,000	3,577	3,577	3,577	3,577	3,213	1,693.4	433.4

* Past actuals (H) as reported in the permit are from 1995-1996 with the exception of SO₂ for which the past actuals were derived from 1989-1990.

** Only emissions from working losses, breathing losses excluded.

Prior year actual emissions extracted from U.S. EPA National Emissions Inventory.

CUP= Crude Unit Preheater project

Information Sources:

Construction Permit - PSD Approval - Revised. Issued to Mobil Oil Corporation. Permit No. 1978000AAA. Issued by IEPA June 8, 1998. Downloaded from IEPA website <http://www.epa.gov/region5/air/permits/ilonline.htm> (Original permit issued November 10, 1997. John Cashman reported that the revised permit made minor corrections to some of the numbers in the permit)

Conversations with John Cashman (IEPA contact for permit 1978000AAA) September 9 and 12, 2002 regarding interpretation of permit and sources for other information related to BACT determination.

Conversation with Julie Capasso of U.S. EPA Region 5 regarding consideration of NOx emissions as ozone precursor in ozone nonattainment areas. September 13, 2002.

<http://www.steeldynamics.com>.

Emissions Inventory Data for 1990-1999. Data files provided by Thomas McMullen, EPA Emission Factor and Inventory Group, September 9 - 17, 2002.

Conversation with Julie Capasso of U.S. EPA Region 5 with follow-up email re: reconciliation of past actuals as reported in the National Emissions Inventory and those reported in the permit. October 2, 2002.

Email from Julie Capasso of U.S. EPA reconciliation of past actuals as reported in the National Emissions Inventory and those reported in the permit. October 8, 2002.

Application for construction permit for CUP project. March 11, 1997.

Mobil Corp. response to IEPA interrogatories related to BACT review of NOx and PM emissions. July 30, 1997.

Public Notice of proposed project. August 1997.

Mobil Corp. request for CUP permit correction request. June 2, 1998.

Mobil Corp. response to IEPA interrogatories related to past actuals, and treatment of units under the permit. November 23, 1998.

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