Mississippi Chapter

Technical Comments on a Proposed Prevention of Significant Deterioration Air Discharge Permit for an Increase in Production, Heavier Sour Crude Processing and Petroleum Product Desulfurization at the Chevron Pascagoula Refinery

submitted to

Environmental Permits Division
Mississippi Department of Environmental Quality

&

Air & Radiation Technology Branch,
Air, Pesticides and Toxics Management Division
U.S. Environmental Protection Agency, Region IV

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1 Introduction

These comments concern the proposed Chevron Pascagoula Refinery Prevention of Significant Deterioration permit to allow a crude feedstock production rate increase, an increased utilization of heavier sour crude and process changes necessary to produce lower sulfur gasoline and diesel products. These comments are filed for the purpose of the required MDEQ public comment period on the proposed permit.

These are detailed, technical comments that are supplementary to oral comments previously made by officers of the Sierra Club Mississippi Chapter at the March 8, 2001 MDEQ public hearing. Commentors ask that this work product be considered as part of the public comment and hearing record on the proposed Chevron PSD permit.

2 Chevron's Emission Characterization and Netting Analysis

2.1 Chevron's Emission Reductions in Their Netting Analysis are Not Properly Documented in the Application

Table 6-2 of the Chevron Application shows contemporaneous emission changes in the netting analysis. Two projects, the Marine Vapor Recovery (MVR) project and the shut down of the wastewater oxidizer (S/D WWO) show very large emission decreases that dominate the netting analysis. There is no documentation in the application to support these emission reduction figures.

Commentors attempted to gain this information from MDEQ by direct request. However, nothing in files MDEQ provided to Sierra Club official Louie Miller showed any indication at all of documentation and support for these large emission reductions.

In particular, the MVP project shows a 1999 emission reduction of 1401 tons per year of volatile organic compounds (VOC). However, an MDEQ official indicated to Commentors that Chevron never reported uncontrolled fugitive marine vessel loading emissions as part of the 1997 emission inventory for this facility.[1] Allowing Chevron to net out of VOC Best Available Control Technology review using claimed emission reductions that were never reported under the state's emission inventory rewards the company for incomplete and inaccurate reporting of inventories necessary for air quality planning purposes.

[1] Personal telephone conversation, Elliot Bickerstaff, MDEQ Emission Inventory section

The claimed MVR VOC reduction undoubtedly came as a result of EPA promulgation of emission standards binding on Chevron under section 183(f) and section 112 of the Clean Air Act. EPA has indicated that the national VOC emission control benefits of marine vessel loading standards to be a total of 20,000 tons of VOC per year for all terminals other than the Alyeska Alaskan Pipeline terminal at Valdez.[2] This means that Chevron is taking the position that they will be achieving a full 7% of the expected national benefit of the standard at this site alone. Such a claim strains credibility.

The emission reductions claimed for the S/D WWO project apparently come from shutdown of an incineration facility to treat sour process water produced at the refinery. A total of 787 tons of sulfur dioxide emission reduction and 122.31 tons of nitrogen dioxide emission reduction are claimed from this shutdown. Again, there is no exposition of the factual basis of this emission reduction estimate. For example, there are no stack tests, emission inventory reports or emission calculations cited.

For the matter of sour water processing and the shut down of this oxidizer, countervailing emission increases in other process equipment must be considered highly likely. For example, if steam stripping was used to remove ammonia and hydrogen sulfide from sour water process streams, such a process change would increase steam demand and boiler firing rates. Moreover, removal of hydrogen sulfide from a contact process stream may increase sulfur fluxes elsewhere in the refinery, such as at sulfur recovery units or in refinery fuel gas. None of these countervailing likely emission increases were accounted for in the emission reduction characterization for the S/D WWO project.

Finally, it appears that a prior permit for the para xylene and ethyl benzene PSD process startup depended on another large reductions in emissions. Nothing is presented in the current application demonstrating that netting emission reductions were not double counted between these two PSD permit actions.

EPA Region 4 raised the issue of justifying these large netting emission reductions that were used to escape Best Available Control Technology review for these pollutants.[3] However, their concern for justifying these large reductions was never answered and a Federal Freedom of Information Act request of EPA Region 4 by Commentors produced no documentation or information on this matter.

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[2] See publication of final regulation at 60 FR 48389

[3] See October 24, 2000 letter from R. Douglas Neeley, EPA Region 4, to Jerry Cain, MDEQ, point 5.

The proposed permit should not be approved until convincing information is made available, is placed on the record and such information stands up to scrutiny by all commentors that the claimed emission reductions noted above are supported by 2 year's worth of actual emission data prior to the dates claimed for these reductions and that such information is supported by stack testing evidence or highly credible emission calculations.

2.2 The Sulfur Dioxide Emission Limitation from the Fluidized Catalytic Cracker Regenerator Stack is Not Verifiable and Practically Enforceable Under the Terms of the Proposed Permit; as a Result, the Promised 767 Ton Per Year Sulfur Dioxide Emission Reduction in the Netting Analysis for the FCC Regenerator Unit Must be Disallowed as Not Federally Enforceable

Chevron is claiming a 767 ton per year reduction of sulfur dioxide emissions from the Fluidized Catalytic Cracker Regenerator Stack as a result of reduced sulfur content of FCC feed as a result of the new hydrogenation processing of FCC feedstock. While this reduction may be plausible, the application contains no design and operating data and no emission calculations to support this large emission reduction, which exerts a considerable influence on sulfur dioxide project emission estimations. This information should be provided before any such permit is granted.

Even more important, however, is that the proposed permit contains no means by which the claimed FCC Catalyst Regenerator stack annual sulfur dioxide emission reduction from this source can be measured, verified and enforced. This means that the use of the 767 ton per year sulfur dioxide emission reduction in the Table 6-2 netting analysis must be disallowed as not federally enforceable.

First, despite the large claimed annual emission reduction, there is no proposed reduction in the current 1000 lb/hour short term sulfur dioxide emission limitation in the proposed permit[4]. As such, the short term emission rate measurable in a stack test cannot be used as a surrogate for the appropriate evaluation and consideration of an annual emission reduction of the claimed size. The short term hourly emission rate must be reduced commensurately to the claimed annual emission reduction for any effective enforceability by using short term stack emission tests.

Second, the monitoring and reporting requirements for the FCC regenerator unit as stated in the proposed permit on page 23 and 24 are totally inappropriate and incapable of ensuring compliance and/or practical enforceability to ensure that the FCC regenerator

[4] See pages 22-24 of the proposed permit on requirements for emission unit 1603, FCC catalyst regeneration system

stack sulfur dioxide emission reduction is achieved. The monitoring requirements provided at page 23-24 are written as though the FCC regeneration was just another RFG-fired process heater at the site when the FCC regeneration process is fundamentally different.

The application contains no information on whether supplemental hydrocarbon fuel is used to support and maintain combustion in the coke burn-off process inherent in processing used FCC catalyst. However, sulfur dioxide emissions from the FCC regenerator stack must be considered primarily a function of the sulfur content of the coke that is present on the spent FCC catalyst. A permit requirement that attempts to measure emissions and evaluate compliance on the basis of supplemental fuels provided to the FCC regenerator spent catalyst coke burning process will necessarily not be able to evaluate all sulfur dioxide emission potential from this source. This source must be monitored with a continuous sulfur dioxide emission monitoring system to ensure compliance with any annual emission limitation that is set. The existing permit makes a sulfur dioxide CEM optional and this is an unacceptable level of compliance assurance and verifiable enforceability on the claimed annual emission reduction.

Third, the language in the special recordkeeping and reporting requirements section for the FCC unit on page 24 allows 24 hour averaging on reported FCC sulfur dioxide emissions. This type of averaging cannot be used to demonstrate compliance with an hourly emission limitation.

Finally, as noted in another section below, the way that the emission limitation for sulfur dioxide is written with its explicit and binding reference to a short term EPA methodology stack test does not allow an annual emission limitation to be practically enforced by the use of credible evidence from any other type of monitoring technique or exposition of operating parameters.

2.3 Chevron's Claim That No Emissions Will Increase From the FCC Catalyst Regenerator Unit is Subject to Question

Chevron has claimed that there will be no change in emissions of nitrogen dioxides, carbon monoxides, volatile organic compounds and particulate matter at the fluidized catalytic cracker regenerator. This claim is difficult to accept in the absence of a condition in which the FCC Catalyst Regenerator process is the "bottleneck" condition in the overall heavy residuals processing at the facility.

The thrust of the present project appears to be to maximize the recovery and production of volatile gas-oils (VGO) from crude distillation and residuals processing together with implicitly more generation of VGO from the crude distillation process implicit in the increased production rate and increasing proportion of heavier sour crude

feedstock. If VGO generation is being increased, this will create an increased demand for FCC processing of VGO unless VGO's are either processed in another fashion in a non-FCC unit or are otherwise sold.

Chevron should certify as part of the application that no changes have been made to the FCC unit since the applicability data of federal PSD regulations that would have triggered new source review requirements at the FCC unit.

2.4 Chevron Hasn't Provided Adequate or Realistic Documentation of the Process and Emission Consequences of Shifts in Sulfur Fluxes at their Facility

Chevron's exposition of sulfur dioxide emissions from the proposed refinery changes do not adequately explain or document changes in sulfur dioxide emissions as a result of the proposed project. The application attempts to show emission increases of 468.44 tons of sulfur dioxide per year from "all other sources affected by increased sulfur in refinery fuel gas." This is not an adequate level of emissions characterization and specificity on a project that involves large shifts in sulfur fluxes between refinery process units.

Nothing in Chevron's application discusses emissions increases associated with increased loading on sulfur recovery processes. It is highly unlikely that the significantly increased processing of hydrogen sulfide and other reduced sulfur compounds inherent with hydrogen desulfurization processing of petroleum liquids will have no impact at all on emissions from sulfur recovery units. The application and emission characterization should be amended to explicitly determine the effect of the project on sulfur dioxide emissions from the sulfur recovery process and associated emission points (i.e. flares).

In particular, Chevron should disclose current hydrogen sulfide and TRS emissions from the refinery and how the project will increase these emissions, in addition to the problem of sulfur dioxide emissions discussed above.

Finally, there is no discussion in the application on the adequacy of sulfur recovery capability at the refinery to manage the increased sulfur load. Failure to ensure adequate sulfur recovery capacity, including backup and redundant sulfur recovery capacity, may lead to an increase in uncontrolled flaring of gases containing hydrogen sulfide, methyl mercaptan and other total reduced sulfur species, or other environmental release events.

2.5 Use of AP-42 Emission Estimates is Inappropriate for Emissions Characterization

Chevron's Application relies on AP-42 emission estimates to support emission calculations[5] and ultimately to set emission limitations implicit with the project. These emission estimates must be questioned as being erroneous. On the matter of using AP-42 factors in BACT determinations, EPA states the following:

> "Emission factors in AP-42 are neither EPA-recommended emission limits (e. g., best available control technology or BACT, or lowest achievable emission rate or LAER) nor standards (e. g., National Emission Standard for Hazardous Air Pollutants or NESHAP, or New Source Performance Standards or NSPS). **Use of these factors as source-specific permit limits and/or as emission regulation compliance determinations is not recommended by EPA.** Because emission factors essentially represent an average of a range of emission rates, approximately half of the subject sources will have emission rates greater than the emission factor and the other half will have emission rates less than the factor. **As such, a permit limit using an AP-42 emission factor would result in half of the sources being in noncompliance**."[6] (Emphasis added).

Here, MDEQ has allowed Chevron to do precisely what EPA has recommended against. Chevron used the resulting emission estimates for crucial "bright line" purposes in netting and other analysis used to escape emission control technology evaluation requirements.

Chevron's emission characterization ought to be supported by stack test data on the affected units. All reliance of AP-42 estimation techniques to set emission limitations should be set aside in the permit and the application in favor of more exact techniques of emission characterization and testing. Similarly, all use of AP-42 emission factors in netting analysis calculations ought to be set aside in favor of more exact methods of emission characterization.

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[5] See, for example, AP-42 factor reliance for process heaters, (section 4.2) and gas turbines (section 4.2).

[6] Introduction to AP-42 Emission Factors, January, 1995, Page 2; available at http://www.epa.gov/ttn/chief/ap42pdf/c00s00.pdf

2.6 The November 24, 1999 Permit

On pages 23, 79, 81, 83, 85 and 87 of the proposed permit there is reference to a November 24, 1999 permit issuance. However, Table 6-2 does not appear to show this permit action or doesn't otherwise identify it. This matter should be clarified on the record.

3 Review of Prevention of Significant Deterioration Applicability Issues and Requirements

3.1 The Application Attempts to Impermissibly Disaggregate Emission Units, Process Units and Sources for Purposes of PSD Major Modification Review

Under Prevention of Significant Deterioration Review:

"*Major Modification* means any physical change in or change in the method of operation of a major stationary source that would result in a significant net emissions increase of any pollutant subject to regulation under the Act."[7]

However, two exceptions to the definition of a "major modification" include:

"(iii) A physical change or change in the method of operation shall not include:...."

"(e) use of an alternative fuel or raw material by a stationary source which: (1) The source was capable of accommodating before January 6, 1975, unless such change would be prohibited under any federally enforceable permit condition which was established after January 6, 1975 pursuant to 40 CFR 52.21 or under regulations approved pursuant to 40 CFR subpart I or §51.166."[8]

"An increase in the hours of operation or in the production rate, unless such change would be prohibited under any federally enforceable permit condition which was established after January 6, 1975, pursuant to 40 CFR 52.51 or under regulations approved pursuant to 40 CFR subpart I or §51.166."[9]

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[7] 40 CFR §51.166(b)(2)(i)

[8] 40 CFR §51.166(b)(2)(iii)(e)(1)

[9] 40 CFR §51.166(b)(2)(iii)(f)

As a result, any physical change or change in the method of operation must be considered a major modification unless it falls within the exceptions (2 of which are cited above) noted at 40 CFR §51.166(b)(2)(iii)(a-k).

Chevron admits at the least that its project is subject to Prevention of Significant Deterioration review for nitrogen oxides, carbon monoxide and particulate matter.

In their September 2000 application, Chevron was considered to have triggered Best Available Control Technology review for a "major modification" as to particulate emissions from coke handling processes, but then attempted to evade review on other processes. At the prodding of EPA Region 4, Chevron then amended their application to include an alleged "BACT analysis" (criticized in a subsequent section) for carbon monoxide and PM/PM10 emissions from furnaces F-1102 and F-6250.

On December 13, 2000, EPA ultimately took the position that an increase in the sulfur content of refinery fuel gas would not be considered a physical change or a change in the method of operation of the several refinery process heaters. EPA's decision was ultimately based on a finding that such a change in refinery fuel gas sulfur content was within the exception noted at 40 CFR §51.166(b)(2)(iii)(e)(1).[10] The effect of this decision is to allow several process and emission units to escape BACT review even though they have increased emissions.

However, this cumulative analysis of what was to be considered as a "major modification" for applicability purposes fails to answer other questions about changes at the refinery that do not appear to be within the exceptions to the definition of major modifications that Commentors believe should trigger PSD BACT review.

Under PSD regulations, the definition of an "emissions unit" has a broad an expansive definition:

> "*Emission unit* means **any part** of a **stationary source** which emits or would have the potential to emit any pollutant subject to regulation on under the Act."[11]

In interpreting this language, Chevron has attempted to cast the smallest and the least expansive inclusive grouping around what process equipment that will be considered to be an emission unit for the purposes of exploring whether or not a physical change or change in the method of operation has occurred. In response to EPA's October 24, 2000 communication on this subject, Chevron stated:

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[10] Personal telephone conference on March 19, 2001 with Dan Deroche, EPA Office of Air Quality Planning and Standards, RTP, NC

[11] 40 CFR §51.166(b)(7)

> "While several process units (i.e. RDS, VDU, Coker, etc) are being modified by the CFP, none of the furnaces (which are emission units) in these process units are undergoing a physical change or a change in the method of operation. Like the boiler in the example above, the furnaces will merely burn fuel gas that they are currently capable of accommodating We believe that the application is consistent with our Mississippi Operating Permit, in which the furnaces are listed as separate emission units."[12]

Chevron's application attempts to lead MDEQ and EPA Region 4 to the conclusion that it can thus disaggregate its individual refinery process equipment groupings into disconnected "emission units" subject to applicability analysis and "other process equipment" that are never considered a part of an emission unit (even though they are integrally connected to and related to the furnace unit) that can be modified or changed at will without triggering any applicability criteria under the regulations. This interpretation of the PSD regulations is fundamentally abusive and fails to recognize the interconnectedness of all related process equipment in a given refinery process grouping. Moreover, Chevron's interpretation is explicitly intended to evade the major modification provisions of the Prevention of Significant Deterioration and New Source Performance Standard regulations when they are clearly performing major modification on their process trains..

Commentor's analysis leads to a different conclusion. Commentors urge that all of the change elements of the entire project (including previous sham minor source permits) be reviewed for major modification applicability purposes with a view toward broader refinery process equipment groupings. Then, for every process grouping where there has been a non-exempted physical change or change in the method operation, all emission points where an increase has occurred for PSD pollutants must then be evaluated for PSD Best Available Control Technology. Chevron's permit should not be approved unless and until the appropriate revised major modification applicability analysis is completed and the resulting BACT reviews have been conducted.

A review of the application indicates that Chevron has made extensive physical changes and changes in the method of operation to process trains for residual processing for the Crude #1 and Crude #2 residuals process trains.

For the Crude #1 residuals process train, the application indicates that they are using heavier crude feedstock that could not be previously processed (change in method of operation and a physical change in the feedstock which could not have been previously physically processed). Crude #1 is also getting a new deep cut vacuum tower (physical change as well as a change in processing method of operation). The vacuum column

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[12] December 8, 2000 letter from Leonard Bloom, Chevron to Jacqueline Summers, MDEQ

furnace is getting a physical change to reduce pressure drop across the furnace.[13] Chevron admits that this physical change "...involves replacing furnace tubing with larger diameter tubing, which is expected to achieve lower pressures."[14] This is Chevron's clear admission that the proposed physical change is not a "like-kind" replacement and is thus not within any major modification exemption for routine repair and replacement.

As a result of these major modifications to the Crude #1 residuals processing train, all process heaters and furnaces that have an increase in annual emissions from either greater emission rates and/or increased utilization which are integrally connected and related to the Crude #1 process train should be reviewed for best available control technology. Chevron's application does not contain the correct major modification applicability analysis and conclusion on the Crude #1 residuals process train and therefore Chevron's application must be rejected.

For the Crude #2 residuals process train, there are piping changes, a physical change associated with using an existing vacuum distillation unit formerly attached to the RDS as a second deep cut distillation unit and there is a change in the method of operation by directly sending Crude unit #1 residual to deep cut vacuum distillation instead of sending it directly to the Coker. Crude Unit II also has a physical change from the removal of hydraulic bottlenecks that will increase capacity.[15]

As a result of these major modifications to the Crude #2 residuals processing train, all process heaters and furnaces that have an increase in annual emissions from either greater emission rates and/or increased utilization which are integrally connected and related to the Crude #2 process train should be reviewed for best available control technology. Chevron's application does not contain the correct major modification applicability analysis and conclusion on the Crude #2 process train and therefore Chevron's application must be rejected

For the Coker, Coker HDN and Coke handling process train, a physical change from equipment addition is being completed to allow more frequent production cycles that were not previously possible, to eliminate coking recycle and to increase hydrocarbon recovery from the coking chamber. The coke handling equipment is being changed and the Coker HDN process is changing feedstocks that could not be previously be fed to the unit because of physical configuration. All of these changes, together with

[13] See section 1.2 and 3.2 of Chevron Application and Figure 1-1 and 1-2.

[14] See section 6.2.1 of Chevron Application, P. 6-5

[15] Chevron Application, P. 3-3

the change to processing of heavier sour crudes and an increased crude processing rate for the refinery overall, lead to a doubling of coke production.[16]

As a result of these major modifications to the Coker, Coker HDN and Coke handling processing train, all process heaters and furnaces that have an increase in annual emissions from either greater emission rates and/or increased utilization which are integrally connected and related to the Coker and Coker HDN process train should be reviewed for best available control technology. Chevron's application does not contain the correct major modification applicability analysis and conclusion on the Coker and Coker HDN process train and therefor Chevron's application must be rejected.

In addition, the fundamental basis of the rule exempting production increases from major modification applicability as a change in the method of operation was intended to address more modest production increases due to a change in market conditions. It was never intended to authorize such large production increases that have arisen from making both substantial physical and operating changes. As a result, use of the increased production exemption should not be allowed for Chevron's doubling of coke production capacity.

The FCC Unit process train is getting the addition of pre-hydrotreating unit from a reconfigured RDS being used for hydrotreating VGO feed to the FCC. At the very least, emissions from the VGO preheating and FCC feed heaters are increasing. There has been a physical change and change in the method of operation in the FCC unit so these furnaces should be getting BACT review since they are integrally connected to the FCC feedstock and output product distillation processes. Chevron's application does not contain the correct major modification applicability analysis and conclusion on the FCC unit and therefor Chevron's application must be rejected

3.2 Chevron and MDEQ May Have Engaged in "Sham Permitting"

Information provided in the Applicant is suggestive of a pattern of "sham permitting" designed to avoid Prevention of Significant Deterioration (PSD) major modification applicability, best available control technology review and public notice of impending emission increases.

In "sham permitting" a major development project is disaggregated into pieces with emission increase thresholds that are less than the PSD significant emissions criteria for major modification applicability over a relatively short interval. The resulting disaggregated pieces are then subjected only to minor modification review. As a result, a

[16] A doubling of coke production is indicated in the Chevron application at Section 1.2, P. 1-2

source engaged in sham application and permitting practices can avoid requirements associated with Prevention of Significant Deterioration major modification permitting, such as detailed technology reviews, air quality impact assessment and public notice requirements.

As noted by EPA, one indication of "sham permitting" is the filing of multiple minor modification permit applications in a short period of time:

> "Filing of more than one minor source or minor modification application associated with emissions increases at a single plant within a short time period. If a source files more than one minor source permit application simultaneously or within a short time period of each other, this may constitute strong evidence of an intent to circumvent the requirements of preconstruction review."[17]

Another indication of sham permitting that is relevant in the current context:

> "....the filing of an application for a federal PSD permit at or near the same time as a state minor source permit...."[18]

In the present case, Chevron is showing a total of 6 minor modification permitted activities with startup from September, 1999 to July, 2000. Chevron filed a PSD major modification permit application for the expansion of the para-xylene/ethylbenzene project in May of 2000. Chevron then filed its current PSD application for the production increase/clean fuels in September, 2000.

With regard to Chevron, the "VDU Deep Cut Project" (February 2000 start up) must be considered inextricably connected from a process and plant construction objective standpoint to the final configuration of the refinery under the current permit and its emphasis on increased processing of heavier sour crude in the feedstock mix. Similarly, the "H_2III Transfer Line" (February 2000 startup) and the "H_2III Turbine Vent" (July 2000 start up) are suggestive of projects that are inextricably connected to an objective of increasing hydrogen production. Such increased hydrogen production is integrally connected to the advent of increased hydrogenation processing at the refinery implicit in petroleum liquid feedstock and process intermediary desulfurization activities necessary to produce lower sulfur gasoline and diesel fuels implicit in the current proposed PSD permit.

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[17] Undated memo on PSD circumvention in regard to 3M Corporation, Maplewood, MN, correspondence between John Rasnic, EPA to George Czerniak, EPA Region 5

[18] Ibid, undated memo on PSD circumvention

Commentors had hoped to review additional projects listed in Table 6-2 pursuant to a public records request made of MDEQ. MDEQ alleges to have provided all material in the Chevron file for the last 5 years. However, Sierra Club reviewing official Louie Miller was unable to locate many of the minor new source review applications and permit materials noted in the Table 6-2 netting analysis in the materials provided by MDEQ.

Despite disclosure of a claim by MDEQ staff that memos existed in the file addressing the sham permitting issue during a telephone conference with staff, MDEQ file materials did not appear to have contained such a memo. No such document appears to have been produced by MDEQ. Commentors made a direct request for such a memo but MDEQ declined to do a "file review" in order to produce the document.

"Sham permitting" is prohibited under EPA policy because it is a circumvention of public notice and technology review requirements binding on sources under the Clean Air Act. It fundamentally undermines the public participation and technology forcing aspects of the new source review program.

The present PSD permit should not proceed until appropriate PSD review, applicability analysis, control technology review and impact analysis are conducted for the aggregate of the PSD crude expansion/clean fuels project together with related minor modification projects discussed above. In addition, EPA Region 4's decision to allow Chevron to separate the September 2000 PSD crude expansion/clean fuels project from the May 2000 para-xylene/ethylbenzene expansion should also be reversed because of the failure to review the combined impacts of both PSD projects together frustrates public participation, evades proper analysis and review of the overall implications for refinery emissions and control technology review and is a deliberate attempt to avoid full scale air quality impact analysis from the combined operation of all such process modifications and emission increases.

3.3 Chevron's Best Available Control Technology Analysis Did Not Follow EPA's Required "Top Down" BACT Review Procedures or the BACT Definition

Under "top-down" Best Available Control Technology (BACT) determinations, the following process must be conducted:

> "In brief, the top-down process provides that all available control technologies be ranked in descending order of control effectiveness. The PSD applicant first examines the most stringent--or "top"--alternative. That alternative is established as BACT unless the applicant demonstrates, and the permitting authority in its informed judgment agrees, that technical considerations, or energy, environmental, or economic impacts justify a conclusion that the most stringent technology is not

"achievable" in that case. If the most stringent technology is eliminated in this fashion, then the next most stringent alternative is considered, and so on."[19]

EPA describes a 5 step process for conducting such a "top down" process:

"STEP 1: Identify All Control Technologies.
- LIST is comprehensive (LAER included).

STEP 2: Eliminate Technically Infeasible Options.
- A demonstration of technical infeasibility should be clearly documented and should show, based on physical, chemical, and engineering principles, that technical difficulties would preclude the successful use of the control option on the emissions unit under review.

STEP 3: Rank Remaining Control Technologies by Control Effectiveness.
Should include:
- control effectiveness (percent pollutant removed);
- expected emission rate (tons per year);
- expected emission reduction (tons per year);
- energy impacts (BTU, kWh);
- environmental impacts (other media and the emissions of toxic and hazardous air emissions); and
- economic impacts (total cost effectiveness, incremental cost effectiveness).

STEP 4: Evaluate Most Effective Controls and Document Results.
- Case-by-case consideration of energy, environmental, and economic impacts.
- If top option is not selected as BACT, evaluate next most effective control option.

STEP 5: Select BACT
- Most effective option not rejected is BACT."[20]

More specifically, the environmental impact aspect of the BACT determination process must consider the effect of a control technology decision on the emission of unregulated toxic pollutants.

The first time this doctrine was clearly articulated was in a case of a municipal waste combustor in California in which citizen commentors appealed a decision of EPA

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[19] EPA 1990 Draft NSR Workshop Manual, P. B.2

[20] Ibid, 1990 EPA NSR Workshop Manual, P B.6

Region IX on a proposed PSD permit for the North County Resource Recovery Associates.[21]

In a remand order back to EPA Region IX, then-EPA Administrator Lee Thomas wrote as to petitioner's allegations:

> "Among the reasons the petitioners present for granting review is Region IX's alleged failure to establish emission limitation for all pollutants, including hazardous pollutants, that will or could possibly be emitted from the facility; the alleged inadequacy of Best Available Control Technology (BACT) determinations;..... With one exception, Region IX has addressed each of petitioners' allegations and has provided rational explanations for not making any alterations in its permit determination.
>
> The exception concerns Region IX's assertion that EPA lacks the authority to "consider" pollutants not regulated by the Clean Air Act when making a PSD determination. This assertion is correct only if it is read narrowly to mean EPA lacks the authority to imposed limitations or other restrictions directly on the emission of unregulated pollutants. EPA clearly has not such authority over emissions of unregulated pollutants.
>
> Region IX's assertion is overly broad, however, if it is means as a limitation on EPA's authority to evaluate, for example, the environmental impact of unregulated pollutants in the course of making a BACT determination for the regulated pollutants. EPA's authority in that respect is clear.....
>
> As defined in §169(3) the term BACT refers to an "emission limitation" that is set on a case-by-case basis for regulated pollutants, "taking into account energy, environmental, and economic impacts and other costs" associated with the particular emission control system that is selected to achieve the BACT emissions limitation. 42 USC §7479(3) (emphasis added) (40 CFR §52.21(b)(12).
>
> Hence, if application of a control system results directly in the release (or removal) of pollutants that are not currently regulated under the Act, the net environmental impact of such emissions is eligible for consideration in making the BACT determination. The analysis may take the form of comparing the incremental environmental impact of alternative emission control systems with the control system proposed as BACT; however, as in any BACT determination, the exact form of the analysis and the level of detail required will depend upon the facts of the individual case. Depending upon what weight is assigned to the environmental

[21] EPA Administrative Decision In the Matter of North County Resource Recovery Associates, Remand Order, PSD Appeal No. 85-2, June 5, 1986.

impact of a particular control system, the control system proposed as BACT may have to be modified or rejected in favor of another system.

In other words, EPA may ultimately choose more stringent emission limitations for a regulated pollutant than it would otherwise have chosen if setting such limitations would have the incremental benefit of restricting a hazardous but, as yet, unregulated pollutant." (Decision at p 3-4)

The precedent that PSD BACT determinations must consider the effects of control technology decisions on unregulated pollutants as part of the environmental impact analysis has been extended and clarified in EPA's transitional guidance memo after the passage of the 1990 Clean Air Act Amendments.

"Toxic Effect of Unregulated Pollutants Still Considered in BACT Analysis -- Based on the remand decision on June 3, 1986 by the EPA Administrator in North County Resource Recovery Associates (PSD Appeal No. 85-2), the impact on emissions of other pollutants, including unregulated pollutants, must be taken into account in determining BACT for a regulated pollutant. When evaluating control technologies and their associated emissions limits, combustion practices, and related permit terms and conditions in a BACT proposal, the applicant must consider the environmental impacts of all pollutants not regulated by PSD. Once a project is subject to BACT due to the emission of nonexempted pollutants, the BACT analysis should therefore consider all pollutants, including Title III hazardous air pollutants previously subject to PSD, in determining which control strategy is best."[22]

As such, both Chevron and MDEQ must consider the effects of all control technology selections and options on unregulated pollutants from these process heaters and from the coke storage and handling process.

3.3.1 Chevron's BACT Determination on Particulate Emission Controls from Coke Storage, Handling and Transfer is Unacceptable

Chevron's BACT determination on coke storage, handling and transfer is inadequate because it did not address two specific issues required by the "top-down" BACT determination process.

First, Chevron's BACT determination did not address the toxic nature of petroleum coke and the potential for airborne transport and deposition of toxic particulate from petroleum coke dust on off-site receptors and biological systems. This type of analysis is inherent in consideration of the environmental impact of a selected control

[22] Ibid, March 11, 1991 Seitz memo at P. 3.

technology. Petroleum coke is known to contain toxic metals such as nickel, vanadium and selenium. In a BACT determination, the control of unregulated toxic air contaminants must be a part of the environmental review and consequence analysis on the selected BACT technology.

Second, Chevron's BACT determination and emission calculations did not address how coke placed in a stored pile is removed and re-entrained in a conveyor system for loading onto barge and railcars. This process can have potential uncontrolled fugitive emissions, particularly with use of front end loaders and open hoppers. The BACT analysis itself fails to consider the option of underpile conveyor reclamation to avoid the need for front end loaders and hoppers. As such, Chevron has failed to conduct a "top-down" BACT review on coke handling because not all technically feasible options were considered in controlling dust from coke transfer operations. In addition, there is no discussion of work practices necessary to control fugitive dust and the use of such items as covered drop shutes to control dust. Consideration of work practices where a numerical emission limitation cannot be imposed is an essential part of the BACT determination process which Chevron has failed to discuss.

3.3.2 Chevron's BACT Analysis for Carbon Monoxide and PM/PM10 from Furnaces F-1102 and F-6250 Fails to Conform to EPA's Required "Top-Down" Procedure and Fails to Consider Unregulated Toxic Pollutants

Chevron's carbon monoxide and PM/PM10 BACT determination for furnaces F-1102 and F-6250 are remarkable for their extreme brevity. Each determination is just three paragraphs long and both fit on a single side of a sheet of paper.

Both the carbon monoxide and the PM/PM10 BACT determination are defective because both determinations fail to conform to EPA's "top-down" BACT determination procedure, fail to consider show how the impact of the control technology decision addressed the emissions and impact of unregulated toxic pollutants and fail to show how the ultimate emission limitation selected conforms to the result of the control technology decision process.

For carbon monoxide, Chevron admits that all process heater have had emission limitations calculated on the basis of 100 ppmv (annual basis) and 250 ppmv (maximum hourly).[23] This also presumably includes F-1102 and F-6250. However, nothing in the application shows why these factors should be considered BACT emission factors for carbon monoxide. In fact, neither these, nor any other emission factors are mentioned in the BACT determination section. There is no review of the RACT/BACT/LAER clearinghouse to examine emission limitations set in carbon monoxide BACT decisions to show why these 100/250 ppmv factors should be selected as BACT. There is absolutely

[23] See Chevron Application, Emission Calculations, P 4-2

nothing in the carbon monoxide BACT determination that connects "good combustion practices and engineering design" on the furnaces with the 100/250 ppmv factors. There is nothing that shows that these emission factors represent the "maximum" degree of emission control feasible within the meaning of the definition of BACT at 40 CFR §51.166(b)(12).

Emissions of carbon monoxide are associated with incomplete combustion. However, the carbon monoxide BACT analysis fails to consider products of incomplete combustion as unregulated toxic pollutants that must be considered in the analysis of the control of carbon monoxide and the setting of appropriate BACT-review-based carbon monoxide emission limitations. Products of incomplete combustion could conceivably include such airborne toxicants as formaldehyde, a known carcinogen.

Similarly, for PM/PM10, Chevron's BACT analysis once again fails to conform to the proper requirements for top down BACT determinations and fails to show how the selected emission limitation constitutes a maximum degree of emission control within the meaning of the definition of BACT at 40 CFR §51.166(b)(12). Again, there is no review of PM/PM10 emission limitations or emission factors from the RACT/BACT/LAER clearinghouse. Outside of the BACT review section, Chevron admits that:

> "For all of the fired sources, the emissions of....PM/PM10 are calculated using factors from AP-42, Section 1.4 (5th edition). These emission factors were multiplied by the proposed, post-project firing rates for each of the furnaces in order to calculate the emissions from each of the fired sources."[24]

This procedure does not constitute a valid BACT review for PM/PM10 emissions from a BACT applicable furnace. In fact, EPA explicitly disavows use of AP-42 emission factors in BACT determinations (See section 2.5 for the EPA policy statement on this matter). MDEQ's approval of Chevron's proposed selection of emission limitations for PM/PM10 for these two sources constitutes clear technical and legal error because of the failure to carry out the required analytical determinations.

3.3.3 The Proposed Permit Allows Excessive Visible Emissions From Furnace F-1102 and F-6250 That Do Not Represent a BACT Level of Particulate Control

The proposed permit contains a 40% visible emission limitation for furnaces F-1102 and F-5250. This is a grossly excessive limitation which does not reflect a BACT level of particulate emission control. This limitation should be revised to 5% opacity.

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[24] Ibid, Chevron Application, P 4-2

4 Proposed MDEQ Permit Language and Content

4.1 The Form of the Numeric Emission Limitation Statements in the Proposed Permit Does Not Permit All Credible Evidence of Violations to Be Used for Enforcement Purposes and Does Not Provide for Practical Enforcement of Annual Emission Limitations

All of the numeric emission limitations in the proposed permit are written in a manner that violates EPA's Credible Evidence Policy. Under the Credible Evidence Policy, all available information that can be determinatively used to show that a facility violated an emission limitation must be available for such use.

Each of the numeric emission limitations are stated with a caveat "....as determined by EPA Test methods [test methods listed]." While it is important to state in a permit what test methods are expected by the regulatory agency to be used when conducting compliance tests, the legal effect of the MDEQ language used is to restrict the use of credible evidence of a violation in most cases. For example, there is no way to use refinery fuel gas hydrogen sulfide concentration and flow data to enforce the numerical sulfur dioxide emission limitation when the compliance demonstration on this limitation is limited to EPA's stack test method for sulfur dioxide. As a result, there is no way to demonstrate, compliance assure or enforce the sulfur dioxide numeric emission limitation absent the use of a pre-announced stack test. Since stack tests are not continuous, compliance with the annual sulfur dioxide limit cannot be demonstrated, compliance assured or enforced.

Required stack testing methods should be set forth in a separate section of each process permit section.

4.2 Performance, Accuracy and Testing Specifications for Sulfur Dioxide Continuous Emission Monitors

The proposed language throughout the permit on continuous emission monitoring equipment for sulfur dioxide is vague and contains no performance, accuracy, audit and testing requirements. This is an unacceptable level of specificity for continuous emission monitoring systems.

4.3 Other Fuel Gas Monitoring Issues

Each furnace/heater section of the proposed permit provides for recordkeeping of the "amount of fuel combusted each day," but the section at page 114 requires the recordkeeping on the maximum amount of fuel combusted per hour. These are not

compatible recordkeeping requirements. The entire permit should be clarified to ensure that both hourly fuel gas hydrogen sulfide averages and hourly gas volume burned in each furnace is recorded and reported. This is the only way that continuous emission monitoring systems can be used for enforcement of both 1 hour and annual sulfur dioxide emission limitations. Moreover, reporting is required to allow federally enforceable emission limitations to be enforced by citizens.

The language at page 114 also discusses 12 month rolling averages, but none of the numerical emission limitations are written in such a way. This matter should be clarified.

4.4 Form Language Authorizing Construction is Problematic

Many sections of the permit contain language discussing authorization to construct air emission points. This type of language, used extensively in the permit for nearly all the emission points, is confusing and legally problematic. For example, page 101 indicates:

> "Beginning ISSUANCE DATE, the permittee is authorized to construct air emissions equipment for the emission of air contaminants from the Hydrogen Plant III, Emission Point AA-542, the 38 MMBTUH Feedstock Furnace(Reference No. F-8610). The air emissions equipment shall be constructed to comply with the emission limitations and monitoring requirements specified below."

The problem is that this source is already in existence and the permit application did not discuss changes requiring a permit to construct for this source. Yet the language of the permit appears as an authorization to construct. At best this is confusing and ambiguous. At worst, language of this type is an impermissible authorization not justified by the permit language that can be further misconstrued. MDEQ should select better form language for continuing authorization of sources which may have had adjusted emission rates.

4.5 No Stack Compliance Testing Requirements are Contained in the Permit

Although the proposed permit contains extensive references to EPA approved compliance testing methods, there appear to be no requirements in the proposal that actually require stack testing of sources to validate and assure compliance. At a minimum, all new equipment should have a stack compliance test for compliance verification.

4.6 Full Form Code of Federal Regulation Citation

The entire proposed permit should be revised to include the full form of all Code of Federal Regulation citation. In many locations only a section number is given and not the full federal citation.

5 Comments on Chevron Air Quality Impact Analysis

5.1 Introduction

Chevron has insisted that its air quality impact analysis conforms to requirements of EPA Guidelines on Air Quality Models (Revised), July, 1999.[25] In addition, Chevron claims that its review of long range transport using the CALPUFF model conforms to requirements on the recommended use of that model.

However, careful examination of both Chevron's work product and the underlying source materials relating to these model applications shows that Chevron has not appropriately performed air quality impact analysis for the Chevron Pascagoula refinery expansion and "clean fuels" project. These failures collectively show Chevron's air quality impact review and visibility protection analysis to be technically in error, unprovable and not acceptable to support permit issuance.

In addition, Commentors assert that just because Chevron relied on an air quality modeling protocol that was approved by MDEQ (and possibly by EPA Region 4), such a reliance cannot be held as a defense against challenges to the validity of Chevron's air quality analysis work product and the requirement that air quality analysis supporting a permit action must be performed correctly to be in compliance with federal Prevention of Significant Deterioration regulations MDEQ has adopted by reference.

5.2 The Shoreline Location of the Chevron Pascagoula Refinery and Unique Mesoscale Air Pollution Dispersion Regimes

The Chevron Pascagoula Refinery is located directly on the shoreline of the Gulf of Mexico. Shoreline zones for emission sources pose special and unique problems in making air quality modeling determinations. In the words of an EPA report on considerations in the measurement of local meteorological data:

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[25] This is Appendix W to regulations at 40 CFR part 51. The document is available at: http://www.epa.gov/ttn/scram/tt25.htm#guidance

> The unique meteorological conditions associated with local scale land-sea breeze circulations necessitate special considerations. For example, a stably stratified air mass over water can become unstable over land due to changes in roughness and heating encountered during daytime conditions and onshore flow. An unstable thermal internal boundary layer (TIBL) can develop, which can cause rapid downward fumigation of a plume initially released into the stable onshore flow. To provide representative measurements for the entire area of interest, multiple sites would be needed: one site at a shoreline location (to provide 10 m and stack height/plume height wind speed), and additional inland sites perpendicular to the orientation of the shoreline to provide wind speed within the TIBL, and estimates of the TIBL height. Where terrain in the vicinity of the shoreline is complex, measurements at additional locations, such as bluff tops, may also be necessary. Further specific measurement requirements will be dictated by the data input needs of a particular model. A report prepared for the Nuclear Regulatory Commission[26] provides a detailed discussion of considerations for conducting meteorological measurement programs at coastal sites."[27]

The shoreline zone location at the Chevron Pascagoula Refinery will be marked by increased frequency of sea breeze direction winds, especially when gradient onshore flow patterns are weak. In addition, the shoreline zone mitigates for increased frequency of highly stable (class E and F) stabilities associated with advection of highly stable sea air overland during warm weather. During both gradient onshore flow and during sea-land breeze mesoscale circulations, elevated air discharges from the Chevron Pascagoula Refinery will be subject to continuous fumigation conditions. Such fumigation conditions are marked by emissions discharged into stable sea air with transport in stable air with little horizontal or vertical dispersion until the stable plumes advect to the internal boundary layer formed from the ground up with unstable air below the layer associated with solar land heating.

Unlike traditional morning inversion breakup fumigation that occurs only for a short time (perhaps a little over an hour), fumigation associated with gradient onshore flow and/or sea-land breeze mesoscale circulation under weak gradient flow can continue all day long during days of strong solar insolation. The location of the point of fumigation will vary with the geometry of the thermal internal boundary layer but, in general, the effect of transport of stable plumes can be expected to increase the distance

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[26] See Raynor, G. S, P. Michael, and S. SethuRaman, 1979. Recommendations for Meteorological Measurement Programs and Atmospheric Diffusion Prediction Methods for Use at Coastal Nuclear Reactor Sites. NUREG/CR-0936. U.S. Nuclear Regulatory Commission, Washington, DC

[27] Meteorological Monitoring Guidance for Regulatory Modeling Applications, Office of Air Quality Planning and Standards, U.S. EPA; EPA-454/R-99-005, February, 2000, Section 3.4, Page 3-12

from the source at which high concentrations of ambient pollutants will occur (unlike traditional dispersion regimes).

Other effects known to occur at shorelines include plume trapping conditions in which mixing heights are limited to 300-500 feet.

Another feature of the physical regime for which modeling is required at this site includes the long over-water fetch associated with pollutant dispersion between the refinery and the Class I Prevention of Significant Deterioration Area at the Breton National Wildlife Refuge. Depending on the time of the year as well as water and air temperatures, the dispersion regime associated with this condition may be dominated by highly stable air (class E and F) and relatively restricted horizontal and vertical dispersion conditions.

As a result of the adverse dispersion conditions associated with over-water long range transport, modeling for visual impact from plume blight must take into account these realistic effects associated with over-water transport and dispersion regimes.

5.3 EPA's Guidelines on Air Quality Modeling Mitigate that the Model Yielding the Most Accurate Physical Depiction of a Pollutant Dispersion Regime be Used

EPA's requirements concerning the selection and use of air quality models binding on EPA regional offices and state programs administering Clean Air Act New Source Review programs is found at 40 CFR Part 51, Appendix W. These guidelines emphasize "sound scientific judgement" and are binding parts of EPA's approved administrative rules. This document provides:

> "The model that most accurately estimated concentrations in the area of interest is always sought....."
>
> "In all cases, the model applied to a given situation should be the one that provides the most accurate representation of atmospheric transport, dispersion, and chemical transformation in the area of interest."[28]

Appendix W emphasizes "case by case" analysis and "the judgement of experienced meteorologists and analysts is essential" in determining proper application of models in Appendix W to the situation at hand. Failure to exercise such judgements can cause serious problems:

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[28] 40 CFR Part 51, Appendix W, Section 1.0

> "A model applied improperly, or with inappropriately chosen data, can lead to serious misjudgements regarding the source impact or the effectiveness of a control strategy."[29]

Commentors maintain the Chevron's air quality modeling effort breached most of these overarching modeling objectives.

5.4 Chevron Improperly Used Tiered Screening Rollback of NOX Emissions as Inputs to its Air Quality Modeling Project

EPA's Appendix W Air Quality Guideline contains certain tiered screening methodologies for analysis of nitrogen dioxide impacts:

> "a. A Tiered screening approach is recommended to obtain annual average estimates of NO_2 from point sources for New Source Review analysis, including PSD, and SIP planning purposes. This multi-tiered approach is conceptually shown in Figure 6-1 and described in paragraphs b and C of this section....."
>
> "Tier 1: Assume Total Conversion of NO to NO_2"
>
> "Tier 2: Multiply Annual NO_x Estimate by Empirically Derived NO_2/NO_x Ratio."
>
> "b. For Tier 1 (the initial screen), use an appropriate Gaussian model from appendix A to estimate the maximum annual average concentrations and assume a total conversion of NO to NO_2. If the concentrations exceeds the NAAQS and/or PSD increments for NO_2 proceed to the 2nd level screen."
>
> "c. For Tier 2 (2nd level) screening analysis, multiply the Tier 1 estimate(s) by an empirically derived NO_2/NO_x value of 0.75 (annual national default). An annual NO_2/NO_x ratio differing from 0.75 may be used if it can be shown that such a ratio is based on data likely to be representative of the locations(s) where maximum annual impact from the individual source under review occurs. In the case where several sources contribute to consumption of a PSD increment, a locally derived annual NO_2/NO_x ratio should also be shown to be representative of the location where the maximum collective impact from the new plus existing sources occur."[30]

However, Chevron erroneously distorts and expands EPA's screening methodology as it is restated in the company's Air Quality Modeling Protocol (Appendix B to the original application):

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[29] Ibid, Section 2.1(c)

[30] Ibid, Appendix W, Section 6.2.3 (models for nitrogen dioxide)

> "The ambient ratio method (ARM) will be used to account for the conversion of NO_x to NO_2 in the atmosphere. The ARM is recommended in EPA's *Guidelines* (EPA, 1999) as a screening approach for estimating annual NO_2 concentrations for point sources. Initially, the national approach for estimating annual NO_2/NO_x ratio of 0.75 will be applied to the maximum modeled NO_x concentration. This value is conservative for locations close-in to point sources, where maximum impacts typically occur. The ARM will be applied to NO_2 concentrations modeled in each of the three analyses: **significance,** NAAQS, and PSD increment." (Emphasis supplied)[31]

This erroneous distortion and expansion continues in the actual September 2000 Chevron Clean Fuels Application:

> "A tiered screening approach for NO_2 emissions was recommended by the EPA in August of 1995 ("Guideline on Air Quality Models (Revised)" July, 1986, 6-5), wherein the initial NO_x concentrations are reduced by applying the empirically derived NO_2/NO_x ratio of 0.75. This ratioing was used **for the project** (i.e. NO_x modeled concentrations were reduced by 25% to obtain NO_2 concentrations **for comparison to the air quality significance level**)."

> "Resulting model concentrations were compared to the standards listed in Table 7-2, which shows the **PSD significance levels**, the PSD monitoring exemptions levels, and the NAAQS for NO_2, CO, and PM/PM_{10}. It also lists the PSD increment consumption levels for NO_x and PM/PM_{10}." (Emphasis supplied)[32]

Both the Protocol and the Application statements are erroneous mis-statements of EPA's methodology because Chevron's statements attempt to extend and expand EPA's tiered methodology beyond National Ambient Air Quality Standards and Prevention of Significant Deterioration increments. Chevron's erroneous statement of the EPA procedure attempts to include PSD significance levels and PSD monitoring exemption levels.

Chevron's Protocol and Application statements noted above are clear indications that the Applicant used the erroneously interpreted procedure to show maximum concentration impacts at numbers less than the PSD significance level. The company submitted a December 5, 2000 version of Table 7-3 showing maximum concentrations of 0.74, 0.85, 0.86, 0.84 and 0.77 respectively for years 1987 through 1991 modeled years. By removing the effect of the impermissibly used Tier 2 ratioing, these maximum

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[31] Air Quality Modeling Protocol, Prevention of Significant Deterioration, Dispersion Modeling for the Chevron Pascagoula Refinery Clean Fuels Project, Prepared for Chevron Products Company by URS Corporation, August 2000 (Appendix B to Chevron Application)

[32] Chevron Clean Fuels Application, Section 7.3, P. 7-5

concentrations are actually 0.98, 1.13, 1.15, 1.12, 1.03 respectively for years 1987 through 1991. All but one of these exceed the PSD Significant Level of 1 ug/m_3 for nitrogen dioxide. The company's revised Table 7-4 map of maximum impact locations shows at least one off-property maxima and others directly adjacent to property lines.

As a result, the modeling for the Chevron permit does not show compliance with PSD significance levels and the permit itself should not be approved under the PSD regulations without more detailed modeling to examine both PSD increment consumption and National Ambient Air Quality Standards Compliance for nitrogen dioxide.

5.5 Tier 2 Rollback of Nitrogen Dioxide Ambient Concentration Predictions is Not Appropriate for Distant Receptors and Long Range Transport for Visibility Modeling

Chevron's air quality modeling analysis is silent on whether Tier 2 rollback of predicted nitrogen dioxide concentrations were used for long range transport and visibility compliance studies. Chevron statements in the prior section indicating that Tier 2 rollback was used "for the project" are suggestive that Chevron did use such rollback.

To the extent that Chevron used Tier 2 nitrogen dioxide rollback was used in long range transport and visibility modeling, the resulting ambient concentration reporting and visibility analysis will be defective and unapprovable. At distances of 40 km that are the subject of such analysis, conversion of NO to NO_2 should be relatively complete. As a result, reliance on rollback that may have some legitimacy within a couple miles of an emission source will have not such legitimacy for long range transport studies.

5.6 Chevron Used the Wrong Model that Doesn't Account for Shoreline-Related and Over-Water-Related Adverse Dispersion Effects

Chevron's modeling exercise used "the latest version (Version 00101) of the Industrial Source Complex Short Term (ISCST3)" air pollution dispersion model to make air quality modeling predictions for short range transport and for long range transport up to 40 kilometers.

ISCST3 assumes a uniform vertical (up to the mixing height) and upwind/downwind dispersion regime. However, these uniform conditions are not found under shoreline conditions which are marked by variable height internal boundary layers, differing upwind and downwind stability class regimes, daylight hour sea-breeze induced fumigation conditions and low level plume trapping. Use of ISCST3 for short range transport predictions under these kinds of physical location parameters is totally inappropriate and violates the Appendix W missives cited in a prior section that case by

case review of the location and application of judgement as to the physical dispersion regime be incorporated in air quality model selection and use.

Appendix W provides an alternative Shoreline Dispersion Model for the explicit situation posed by the Chevron Pascagoula refinery:

> "Fumigation is also an important phenomenon on and near the shoreline of bodies of water. This can affect both individual plumes and area-wide emissions. When fumigation conditions are expected to occur from a source or sources with tall stacks located on or just inland of a shoreline, this should be addressed in the air quality modeling analysis. The Shoreline Dispersion Model (SDM) listed in appendix B may be applied on a case by case basis when air quality estimates under shoreline fumigation conditions are needed. Information on the results of EPA's evaluation of this model together with other coastal fumigation models may be found in reference 134. Selection of the appropriate model for applications where shoreline fumigation is of concern should be determined in consultations with the Regional Office."[33]

The Chevron model selection completely ignores this aspect of the Appendix W modeling guidance.

In addition, the ISCST3 model will misinterpret the stability class implication of input meteorological data by creating a presumption for less stable atmospheres than would be expected in over-water and near shoreline dispersion regimes. Chevron has attempted to use the ISCST3 model to predict ambient impacts for long range transport (up to 40-50 km) and visibility protection demonstrations for the Breton Class I PSD area for a transport regime that is characterized by nearly 100% fetch over the Gulf of Mexico to the Breton area. Because the processor of ISCST3 will mis-interpret likely over-water transport stability classifications in favor of unstable regimes during the warm season when highly stable regimes for over-water transport are expected, such use of ISCST3 poses serious technical and regulatory error. This is a particularly serious error for the purposes of visibility impairment since the maximum visibility impairment associated with blight from a merge refinery plume will occur at long distances under high atmospheric stability conditions inherent with restricted horizontal and vertical dispersion.

In effect, Chevron's ISCST3 long range transport analysis attempted to model an overland dispersion regime and subsequent pollutant concentration profile for purposes of input into visibility analysis and then attempt to apply this over-land fetch characterization to the over-water fetch physical conditions. This is nothing less than an abuse of air quality modeling in addition to constituting serious scientific, legal and technical error.

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[33] Ibid, Appendix W, Section 8.2.9

5.7 Chevron Used Uncharacteristic Meteorological Data that Doesn't Fairly Represent Meteorological Conditions at a Shoreline Location or the Over-Water Fetch to the Breton Class I Area

According to the Chevron Application:

> "The five most readily available years of hourly surface data from the National Weather Service station in Mobile, Alabama, along with representative mixing height data from Louisiana, were used for PSD modeling. The period (1987-1991) yield data which are considered as representative of the conditions found at the facility."[34]

The National Weather Service Mobile, AL station is located at least 11 miles from Mobile Bay and at least 23 miles from the Gulf shoreline to the South. The Lake Charles, LA mixing height data station is located about 25 miles from the Gulf shoreline to the south. Neither of these stations can be considered representative of meteorological conditions expected to occur at the shoreline location of the Pascagoula refinery. For example, emission sources at the Pascagoula site may be subject to low level plume trapping conditions with far lower mixing heights than would ever be seen regularly at an inland location such as Lake Charles, LA.[35]

Use of wind data from Mobile, AL will not reflect the frequent daylight hours sea breeze mesoscale circulation that will be typical of the Chevron Pascagoula Refinery location. These mesoscale wind circulation patterns can be expected to significantly increase the frequency of winds with an northern vector component that will be of particular interest to populated areas to the north and northwest of the plant.

Finally, temperature data at a shoreline location in the summer time will generally be about 5-8 degrees F lower in overall distribution. As such, plume rise calculations will likely be affected by failure to incorporate accurate temperature modeling in the exposition of air quality models.

Chevron should have installed a meteorological tower at this site long ago for the purpose of collecting site-specific meteorological data to properly support it air quality permitting activities because of this apparent need for site specific data. Such capability would also be needed to properly perform risk assessments on accidental releases of toxic substances from the refinery.

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[34] Chevron September 2000 Clean Fuels Application, Section 7.6, Page 7-6

[35] See, for example, the work of Lyons and Cole on shoreline effects.

5.8 Chevron's Didn't Use Over-Water Fetch Modeling Capabilities in CALPUFF

Chevron used CALPUFF to model long range transport beyond 50 kilometers in its failed attempt to determine visibility impacts on the Breton Class I Prevention of Significant Deterioration area. CALPUFF is not presently shown in Appendix W as an approved model; at the present time, EPA has proposed to approve CALPUFF as part of Appendix W. Commentors do not dispute the use of CALPUFF for long range transport modeling.

According to the CALPUFF User's Guide,[36] the features of CALPUFF include:

> "Overwater and Coastal Interaction Effects: Because the CALMET meteorological model contains both overwater and overland boundary layer algorithms, the effects of water bodies on plume transport, dispersion, and deposition can be simulated with CALPUFF. The puff formulation of CALPUFF is designed to handle spatial changes in meteorological and dispersion conditions, including the abrupt changes which occur at the coastline of a major body of water."[37]
>
> "The techniques used in the CALMET[38] meteorological model for determining overwater mixing height, stability, and surface layer parameters are based on the air-sea temperature difference, wind speed, and the specific humidify (Scire et al, 1998). These methods are applied by CALMET to the portions of the modeling domain over water. At the land-sea interface, rapid changes in the dispersion characteristics may occur which can significantly affect the ground-level concentrations from coastal sources. The puff model formulation is well-suited to accommodate these spatial changes in the coastal transition zone."[39]

It is thus quite apparent that the CALPUFF model has sophisticated features that would have allowed it to accurately model the ambient concentrations at the Breton Class I Prevention of Significant Deterioration area from long range, over-water transport. Such accurate model predictions are essential for predicting visibility impairment from plume blight caused by the Chevron Pascagoula Refinery emission increases.

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[36] A User's Gude for the CALPUFF Dispersion Model (Version 5), January 2000. Available for download at http://www.src.com/calpuff/calpuff1.htm

[37] Ibid, CALPUFF User Guide at P. 1-14

[38] CALMET is the meteorological data input processor to the CALPUFF dispersion model.

[39] Ibid, CALPUFF User Guide at P. 2-64

Although CALPUFF has these important features for modeling long range transport in an over-water fetch to the Breton area, it is apparent from available evidence in Chevron's CALPUFF modeling runs that these over-water features were not used. Instead, Chevron once again unfortunately attempts to portray an over-land modeling exercise as being characteristic of the Breton over-water fetch dispersion regime.

A review of Chevron files CHEVPUF5.LST and CHEVPUF6.LST both indicate that Chevron used over-land dispersion coefficients associated with the over-land implementation of the ISCST model in its selection:

> "3 = PG dispersion coefficients for RURAL areas (computed using the ISCST multi-segment approximation) and MP coefficients in urban areas"

Despite the best efforts of the CALPUFF authors to provide a model that could accurately assess the over-water dispersion regime between the Chevron refinery and the Breton Class 1 area, Chevron's air quality modelers circumvented the capabilities of CALPUFF to accurately conduct this modeling.

5.9 The PSD Air Quality Impact Analysis for the Clean Fuels Project and the Para-Xylene/Ethylbenzene Expansion Must be Consolidated into a Single Analysis

MDEQ presently has before it two PSD applications from Chevron – one for the Clean Fuels Project and one for the Para-Xylene/Ethylbenzene Expansion Project. From an air quality impact standpoint, both projects must be evaluated together and the impact analysis from both projects must be consolidated into one air quality analysis.

Expected ambient impacts for two projects that were submitted in the same year and which will be approved in the same year will reflect the combined impact of both projects and their respective emission increases.

Chevron's attempt to separate the air quality impact and visibility protection analysis for both of these PSD permit applications into separate documents is abusive and violates PSD impact procedure. The only reason that both of these air quality impact analyses have been separated is Chevron's attempt to disaggregate the combined air contaminant impact of both projects for the purpose of escaping more detailed (and required) air quality modeling analysis concerning visibility protection, PSD increment consumption and national ambient air quality standard compliance.

MDEQ's decision to allow Chevron to disaggregate the air quality impact analysis of both of these projects constitutes agency technical error and abuse of discretion as it

undermines both the letter and the intent of the Federal Clean Air Act and applicable federal and state regulations promulgated pursuant to these statutes.

5.10 Air Quality Modeling for the Clean Fuels Project Should be Redone

For the reasons cited in this section, the MDEQ approval of the Chevron Air Quality Modeling Protocol, the Chevron Clean Fuels Project air quality impact demonstration and the Breton area visibility analysis [as well as all analogous documents for the Para-Xylene/Ethylbenzene project] should all be held for naught as all being indefensible on a technical, regulatory and legal basis. As a result, the permit should not be issued until valid and acceptable air quality modeling and visibility studies that comply with Appendix W have been completed.

6 Chevron Should Disclose Mercury Throughput and Emissions Information to the Community

Mercury is known to be a contaminant of crude oil feedstocks that refineries can receive. Chevron should disclose the amounts of mercury they presently receive in crude feedstocks and the amounts that may occur with a shift to heavier sour crudes. Chevron should conduct mass balance and emission testing studies at its facility to disclose the fate of mercury in the refinery systems and the amount that is released in refinery fuel gas and other combustion systems, in wastewater effluents and in products. Finally, Chevron should conduct environmental and biological system monitoring, particularly in adjacent wetlands to determine if the refinery has had a past impact on mercury pollution of the environment. All of this information should be disclosed to MDEQ, EPA and the public.

7 Commentor's Request for Future MDEQ Administrative Process

Commentors request that MDEQ answer each and every comment raised in this document and in public hearing oral comments in a written responsiveness summary that states final findings of fact and conclusions of law.

Commentors raise substantial technical and legal error issues in regard to the proposed issuance of the permit. As a result, Commentors ask that any decision to issue the proposed permit in the absence of correction of all outstanding problems be accompanied with a 60 day stay in the effective date of the permit.

Given the extensive nature of problems with this proposed permit and permit application, Commentors ask that resolution of these problems take place with an

amended application by Chevron and subsequent re-analysis and re-publication by MDEQ of a revised proposed permit and technical analysis, together with an additional opportunity for public comment and a public hearing.

Commentors request formal written service of the final MDEQ permit, final statement of basis and final responsiveness summary at the addresses shown on the cover of this document.