CHAPTER 6
PROJECT ALTERNATIVES

CHAPTER 6.0

PROJECT ALTERNATIVES

INTRODUCTION

This EIR provides a discussion of alternatives to the proposed project as required by CEQA. According to the CEQA guidelines, alternatives should include realistic measures to attain the basic objectives of the proposed project and provide means for evaluating the comparative merits of each alternative. In addition, though the range of alternatives must be sufficient to permit a reasoned choice, they need not include every conceivable project alternative (CEQA Guidelines, ~~Section~~ §15126.6(a~~d~~)~~(5)~~). The key issue is whether the selection and discussion of alternatives fosters informed decision making and public participation.

Alternatives presented in this chapter were developed by reviewing alternatives to the use of modified HF and different methods to obtain more CARB compliant gasoline blending stocks. Consequently, each project alternative described below is similar to the proposed project in most respects. The rationale for selecting specific components of the proposed project on which to focus the alternatives analysis rests on CEQA's requirements to present a range of reasonable project alternatives that could feasibly attain the basic objectives of the project, while generating fewer or less severe adverse environmental impacts.

The objectives of the proposed project are as follows:

- Implementation of Environmental Justice Program Enhancements for FY 2002-03 that include re-initiation of rulemaking similar to the former Rule 1410 – Hydrogen Fluoride Storage and Use, or achieving the same end result through an enforceable mechanism, such as an MOU and associated permit requirements.

- Eliminate the transport, storage and use of concentrated HF at the Ultramar Inc. - Valero Wilmington Refinery and the related potential consequences in the event of a release.

- Incorporate alkylation efficiency improvements and design capacity enhancements to help offset losses associated with the installation of the ReVAP process and CARB Phase 3 requirements including the elimination of MTBE.

The alternatives presented in this chapter involve modifications to aspects of the specific equipment or operations of the proposed project that would still allow the Refinery to meet the objectives of eliminating the transport, storage and use of concentrated HF and meeting CARB specifications for gasoline and diesel fuel.

Section 15126.6(f) of the CEQA Guidelines stipulates that the range of alternatives required in an EIR is governed by a rule of reason in that the EIR must discuss only those alternatives "necessary

to permit a reasoned choice" and those that could feasibly attain most of the basic objectives of the proposed project.

The project alternatives were developed by modifying one or more components of the proposed project taking into consideration the project's limitations as to space, permitting requirements, and compliance agreement stipulations. Unless otherwise stated, all other components of each project alternative are identical to the proposed project. Both the identified feasible project alternatives as well as the alternatives rejected as infeasible are discussed further below.

Aside from the two alternatives described below, no other project alternatives were identified that met the objectives of the proposed project, while substantially reducing significant adverse environmental impacts and complying with the MOU between the SCAQMD and the Refinery.

ALTERNATIVES REJECTED AS INFEASIBLE

In accordance with CEQA Guidelines §15126.6(c), a CEQA document should identify any alternatives that were considered by the lead agency, but were rejected as infeasible during the scoping process and briefly explain the reason underlying the lead agency's determination.

Section 15126.6(c) also states that among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: (1) failure to meet most of the basic project objectives; (2) infeasibility; or (3) inability to avoid significant environmental impacts. Furthermore, CEQA Guidelines §15126.6(f)(2)(B) indicates that if the lead agency concludes that no feasible alternative locations for the project exist, it must disclose the reasons for this conclusion, and should include the reasons in the EIR.

Alternate Oxygenates: The proposed project objective is to eliminate the use of concentrated HF and comply with California's CARB Phase 3 requirements for gasoline produced by the Ultramar Inc. - Valero Wilmington Refinery. The proposed project includes removing MTBE and replacing it with ethanol to comply with the federal oxygenate requirement. There are a number of other oxygenates besides MTBE and ethanol that could potentially be used in gasoline. However, with California's ban on MTBE and the requirements of the CARB regulations, ethanol is the only acceptable oxygenate that can be used to produce Phase 3 Reformulated Gasoline. Therefore, alternatives to the use of ethanol are not feasible and were not evaluated.

Sulfuric Acid Alternative: Sulfuric acid alkylation is an alternative to HF alkylation. Under this alternative, the Ultramar Inc. – Valero Wilmington Refinery would need to construct a completely new alkylation unit and eliminate the existing alkylation unit, because sulfuric acid alkylation is an entirely different processing using a different technology. The Refinery has determined that this is not a feasible alternative. The Refinery uses essentially all of its existing property and does not have sufficient space to construct a new alkylation unit, and required new storage tanks and unloading facilities (see Figure 2-4). This alternative would require that the Refinery: (1) find additional land outside of the Refinery to locate the alkylation unit; or (2) shut down and demolish the current alkylation unit prior to constructing the new alkylation unit. Both these options are considered infeasible for the reasons identified below. In addition, to would take substantially

longer to permit, design and construct such a unit and eliminate the use of concentrated HF than the proposed project.

All potentially suitable property surrounding the Refinery is currently being used for other industrial and port-related land uses. The Port of Long Beach in recent years acquired virtually all suitable land and redeveloped it, including rail line interconnection to the Alameda Corridor Project. The property is not available to the refinery and there is not other land in the vicinity of the existing Refinery suitable for the construction of an alkylation unit. As shown on Figure 2-4, the Refinery is bounded to the north by railroads and Anaheim Street, to the south by railroads and marine cargo transport and storage facility, to the east by Terminal Island Freeway and automobile storage yards, and to the west by the Dominguez channel. Further, even if land were available, locating a new unit off the Refinery would necessitate extensive construction for the unit itself, numerous modification to other units to provide compatibility with the new unit, pipelines to transfer product to/from other operating units at the Refinery, new gas and electric utilities, fire-fighting and mitigation systems, access roads, and security and administrative facilities. This could involve potentially significant environmental impacts and prohibitive economic costs.

The other option is to construct a sulfuric acid alkylation unit within the existing Refinery. To make space for this, the existing unit would have to be shutdown and demolished. This and construction of a new alkylation would require approximately one year. This shutdown would effectively eliminate the ability of the Refinery to produce fuels in compliance with California reformulated fuels requirements, eliminating it as a major source of gasoline for the California market. Current California refining capacity is barely adequate to meet the state's gasoline demands. Eliminating the Refinery's ability to produce California reformulated gasoline for one year would lead to potential spot shortages and adverse economic effects in the region.

Solid Catalyst Technology: HF solid catalyst technology has been under development. This technology is expected to reduce the risk of using HF as a catalyst since it would be in solid form and less subject to a release. Research in the area of solid catalyst for alkylation has been ongoing for many years. However, earlier attempts by many companies such as Catalytica, Haldor Topsoe, Mobil, University Corporation for Atmospheric Research Office of Programs (UOP), Lummus/Akzo, and Idaho National Engineering and Environmental Labor (INEEL) to develop a viable solid acid alkylation process have not yet led to commercial availability. Patents exist for different catalysts, catalyst supports, and processes. Currently, the two main hurdles solid catalyst processes have to overcome include catalyst life (how long the catalyst can be used) and catalyst regeneration (how the catalyst can be recycled and reused) (SCAQMD, 2003c).

ABB Lummus Global and Akzo Nobel Catalysts have jointly developed a new solid acid catalyst process called AlkyClean. This new technology is now entering its demonstration phase in Finland. ABB Lummus and Akzo Nobel estimate it will take up to two and a half years after full commercialization to engineer a unit for a new customer (SCAQMD, 2003c). While this technology may be commercially available at some point in the future, it is not currently available. Waiting for a solid catalytst technology to become available would delay efforts to reduce the HF risks at the Refinery. Therefore, the use of a solid catalyst technology is considered to be infeasible at this time.

Alternative Sites: An alternative location is not feasible as the proposed project consists of modifications to an existing facility that contains necessary processing units; natural gas, water, and electric transmission infrastructures; petroleum product transportation infrastructure; and the appropriate land use designation necessary to support the project. Advantages of the existing site would be lost if another location were proposed. The development of a new refinery in an alternative location would require substantially more equipment, construction, and potentially generate substantially greater impacts in many environmental categories (e.g., air quality, traffic and hazards) than the proposed project. Further, development of an alkylation unit at another location would be infeasible as the other services provided by the refinery would still be required (e.g., refinery fuel gas, flares, storage facilities, feedstocks, etc.). Therefore, an alternative site for the project is not feasible.

DESCRIPTION OF THE PROJECT ALTERNATIVES

Alternative 1 – No Project Alternative

Under the "No Project Alternative," no Refinery modifications would occur. The proposed modifications to the Alkylation Unit to use modified HF would not occur and the Refinery would continue to use HF. In addition, the proposed Refinery modifications to the Butamer, LPG Merox Treating Unit, Light Ends Recovery, and Naphtha Hydrotreater Units would not occur. The proposed new Fuel Gas Treating System, new steam boiler (and SCR), cooling tower, emergency flare, butane storage sphere, propane storage sphere, and new aqueous ammonia storage tank would not be constructed. The proposed modifications to existing Heater 56-H-2 would not be required and the existing storage tanks near the Alkylation Unit would not need to be relocated.

The "No Project Alternative" would not meet the objectives of the proposed project which included: (1) Implementation of Environmental Justice Program Enhancements for FY 2002-03 that eliminate the transport, storage and use of concentrated HF at the Refinery and the reduction of related potential consequences in the event of a release; and (2) Incorporation of alkylation efficiency improvements and design capacity enhancements to help offset losses associated with the installation of the ReVAP process and CARB Phase 3 requirements including the elimination of MTBE. Further, the No Project Alternative would not be consistent with the MOU between the SCAQMD and the Refinery. The MOU is a legally binding agreement.

Alternative 2 – No Increase In Alkylation Capacity

Under this alternative, the project will be modified to include changes to the Refinery associated with the use of modified HF only and the changes to increase the alkylation capacity would be eliminated. The proposed modifications to the Alkylation Unit to use modified HF would occur and the Refinery would use the modified HF catalyst. The proposed Refinery modifications to the Butamer, LPG Merox Treating Unit, Light Ends Recovery, and Naphtha Hydrotreater Units would not occur. The proposed new Fuel Gas Treating System, new steam boiler (and SCR), cooling tower, emergency flare, butane storage sphere, propane storage sphere, and new aqueous ammonia storage tank would not be constructed. The proposed modifications to existing Heater 56-H-2 also

would not be required. Alternative 2 would result in a reduction in alkylate produced by the Refinery as the use in the modified HF catalyst and related equipment is expected to result in a reduction in alkylate production. Alkylate is a key component of gasoline so less gasoline would be produced under Alternative 2. Under this alternative it is likely that additional alkylate would be imported into southern California to make up for the loss in alkylate production.

ENVIRONMENTAL IMPACTS FROM THE PROJECT ALTERNATIVES

Alternative 1 – No Project Alternative

Air Quality: Air quality impacts associated with construction under Alternative 1 would be eliminated because no construction activities would be required. Construction emissions associated with the proposed project were considered significant for CO, VOC, NOx, and PM10.

The emissions associated with the operational phase of Alternative 1 would be less than the proposed project since no new or modified units are required under this Alternative. Therefore, the emissions identified in Table 4-4 (including 483 lbs/day of CO, 275 lbs/day of VOC, 202 lbs/day for NOx, 190 lbs/day of SOx, and 268 lbs/day of PM10), would be eliminated. The No Project Allternative would eliminate all emission increases associated with the proposed project during the operational phase. Consequently, Alternative 1 would result in no significant air quality impacts.

Alternative 1 would eliminate the increased toxic air contaminant emissions and the associated health risks. Therefore, the health risks associated with the proposed project would be eliminated. The health risks associated with the proposed project (both carcinogenic and non-carcinogenic) were considered to be less than significant.

Hazards: The No Project Alternative would be expected to result in greater hazards than the proposed project since the proposed project would eliminate the potentially significant hazard impacts associated with the transport, storage, and use of HF. The continued use of HF is expected to continue existing hazard impacts from the use, storage and transport of HF as compared to the reduction in hazards impacts from the proposed project as a result of changing to modified HF (see Table 4-10).

Alternatively, implementation of Alternative 1 would eliminate the potentially significant hazard impacts associated with the Light Ends Recovery Unit, Naphtha Hydrotreater, Merox Unit, Butamer Unit, butane storage bullet and propane storage bullet. While the hazard impacts associated with modifications to these units are considered to be significant, all of the potential hazards are confined to the industrial area near the Refinery, where workers often have safety training and access to safety equipment is readily available.

Hydrology and Water Quality: The No Project Alternative would eliminate the increase in water during both the construction and operational phases. The proposed project is expected to increase the water demand at the site by about 434 gallons per minute or about 625,000 gallons per day. The water use associated with the proposed project was considered less than significant.

Implementation of the No Project Alternative would eliminate the potential increase in water demand and the impacts would remain less than significant.

Noise: The No Project Alternative would eliminate the increase in noise during both the construction and operational phases. The proposed project is expected to increase the noise levels at the Refinery due to operation of construction equipment and new refinery equipment. The increased noise levels associated with the proposed project was considered less than significant during both the construction and operational phase of the proposed project as no noticeable noise increase is expected. Implementation of the No Project Alternative would eliminate the potential noise impacts and the impacts would remain less than significant.

Traffic/Transportation: The No Project Alternative would eliminate traffic associated with construction activities since the new units and modifications to the Refinery would not be constructed. The construction traffic impacts associated with the proposed project are less than significant. The proposed project impacts on traffic during the operational phase would also be less than significant. The No Project Alternative would eliminate construction and operation traffic impacts associated with the proposed project.

Alternative 2 – No Increase In Alkylation Capacity

Air Quality: Air quality impacts associated with construction under Alternative 2 would be reduced because fewer construction activities would be required. Construction activities would be limited to emissions associated with modifications to the Alkylation Unit. Under Alternative 2, the construction activities are expected to be about 50 percent less than the peak construction activities associated with the proposed project, since about one-half of the project would be developed (see Table 6-1). Based on this assumption, the construction emissions from construction activities would remain significant for CO, VOC, and NOx emissions but would be reduced to less than significant for PM10. SOx emission impacts did not exceed the SOx significance threshold for the proposed project and would be 50 percent less (approximately 30 pounds per day) under Alternative 2.

TABLE 6-1

ULTRAMAR INC. – VALERO WILMINGTON REFINERY
PEAK DAY(1) CONSTRUCTION EMISSIONS FOR ALTERNATIVE 2
(lbs/day)

ACTIVITY	CO	VOC	NOx	SOx	PM10
Construction Equipment	639	51	307	29	12
Light Duty Trucks/Buses	5	<1	1	--	<1
Heavy Diesel Trucks	12	17	15	--	<1
Workers Commuting	195	15	21	<1	<1
Fugitive Dust From Construction(2,3)	--	--	--	--	109
Fugitive Road Dust(2,3)	--	--	--	--	14
Architectural Coatings	--	105	--	--	--
Total Construction Emissions(4)	**851**	**189**	**344**	**30**	**138**
SCAQMD Threshold Level	**550**	**75**	**100**	**150**	**150**
Significant?	**YES**	**YES**	**YES**	**NO**	**NO**

(1) Peak emissions for all pollutants except PM10 predicted to occur during September 2005.
(2) Peak emissions of PM10 predicted to occur during January 2005.
(3) Assumes application of water two times per day.
(4) The emissions in the table are assumed to be 50% from those in Appendix B.

The emissions associated with the operational phase of Alternative 2 would be less than the proposed project since only modifications to the Alkylation Unit would be required under this Alternative. Therefore, the emissions identified in Table 4-4 will be eliminated with the exception of the emissions from the Alkylation Unit and the emissions from the delivery trucks associated with the Alkylation Unit (see Table 6-2). Consequently, Alternative 2 would reduce the significant impacts associated with CO, NOx, SOx, and PM10 to less than significant. VOC emissions would still be expected to be significant. However, under this alternative it is likely that additional alkylate would be imported into southern California to make up for the loss in alkylate production, generating additional emissions from mobile sources, e.g., marine vessels, trains or trucks.

Alternative 2 would eliminate the increased toxic air contaminant emissions from all of the units except the Alkylation Unit and reduce the associated health risks. Therefore, the health risks associated with Alternative 2 less than the proposed project. The health risks associated with the proposed project (both carcinogenic and non-carcinogenic) were considered to be less than significant.

TABLE 6-2

ULTRAMAR INC. – VALERO WILMINGTON REFINERY STATIONARY SOURCE OPERATIONAL EMISSIONS (lbs/day)

Sources	CO	VOC	NOx	SOx	PM10
STATIONARY SOURCES:					
Alkylation Unit	--	75.7	--	--	--
Daily Delivery Trucks	33.6	49.8	45.0	0.4	0.8
Fugitive Road Dust	--	--	--	--	32.2
Total Operational Emission Increases under Alternative 2:	33.6	125.5	45.0	0.4	33.0
Significance Thresholds	550	55	55	150	150
Significant?	NO	YES	NO	NO	NO

Hazards: Implementation of Alternative 2 would eliminate the potentially significant hazard impacts associated with the Light Ends Recovery Unit, Naphtha Hydrotreater, Merox Unit, Butamer Unit, butane storage bullet and propane storage bullet. While the hazard impacts associated with modifications to these units are considered to be significant, all of the potential hazards are confined to the industrial area near the Refinery where workers often have safety training and assess to safety equipment is readily available.

Hydrology and Water Quality: Alternative 2 would reduce the increase in water demand during both the construction and operational phases. The proposed project is expected to increase the water demand at the site by about 434 gallons per minute or about 625,000 gallons per day. The water use associated with the proposed project was considered less than significant. Implementation of Alternative 2 would reduce the potential increase in water demand since less construction activities would be required. Further, the water demand at the Refinery during operation of the modified Alkylation Unit is expected to remain about the same as the baseline water demand. Therefore, the water demand impacts would remain less than significant.

Noise: The No Increase in Alkylation Capacity Alternative would reduce noise associated with both the construction and operational phases of the proposed project. The proposed project is expected to increase the noise levels at the Refinery due to operation of construction equipment and new refinery equipment. The increased noise levels associated with the proposed project was considered less than significant during both the construction and operational phase of the proposed project as no noticeable noise increase is expected. Implementation of Alternative 2 would require less construction and operational equipment so that less noise would be generated. The noise impacts under Alternative 2 would remain less than significant.

Traffic/Transportation: The No Increase in Alkylation Capacity Alternative would reduce traffic associated with construction activities since the only the Alkylation Unit would require modification. The construction traffic impacts associated with Alternative 2 are less than the proposed project and traffic impacts under Alternative 2 would be less than significant. The proposed project impacts on traffic during the operational phase would also be less than significant and would be limited to delivery trucks related to the Alkylation Unit.

CONCLUSION

Table 6-3 compares the potential environmental impacts of the various alternatives relative to the proposed project. Based on the analyses herein, no feasible alternatives were identified that would reduce or eliminate the potentially significant air quality or hazard impacts related to the proposed project and achieve the objectives of the proposed project (i.e., to eliminate the transport, storage and use of concentrated HF at the Refinery and incorporate alkylation efficiency improvements).

The No Project Alternative (Alternative 1) would not eliminate the transport, storage and use of concentrated HF at the Refinery which is one of the major objectives of the proposed project and part of the requirement of the MOU between the SCAQMD and the Ultramar Inc. – Valero Wilmington Refinery. Further, the No Project Alternative would result in greater hazards at the Refinery related to the handling, storage and use of HF because it would continue to use concentrated HF. Other hazard impacts associated with the proposed project, e.g., hazards associated with the butane storage sphere, the propane storage bullet, etc. would not occur under Alternative 1.

Alternative 2 would result in significant impacts to air quality but the hazards associated with the Light Ends Recovery Unit, Naphtha Hydrotreater, Merox Unit, Butamer Unit, butane storage bullet and propane storage bullet would be eliminated. Therefore, Alternative 2 would be considered the superior alternative as it would eliminate one of the potentially significant impacts (hazards). However, Alternative 2 would not allow the Refinery to meet the project objective of improving the efficiency of the Alkylation Unit to help offset losses associated with the installation of the ReVAP process and CARB Phase 3 requirements including the elimination of MTBE. Further, under this alternative it is likely that additional environmental impacts would occur as a result of the need for additional alkylate that would need to be imported into southern California to help the Refinery make up the gasoline production losses as a result of phasing out the use of MTBE.

TABLE 6-3

ENVIRONMENTAL IMPACTS OF ALTERNATIVES
as compared to proposed project

ENVIRONMENTAL TOPIC	Proposed Project	Alternative 1[(1)]	Alternative 2[(1)]
Air Quality			
Construction	S	NS(-)	S(-)
Operation	S	S(-)	S(-)
Toxic Air Contaminants	NS	NS(-)	NS(-)
Hazards and Hazardous Materials			
Operation	S	S(+)	NS(-)
Transportation Risks	NS	S(+)	NS(-)
Hydrology and Water Quality	NS	NS(-)	NS(-)
Noise			
Construction	NS	NS(-)	NS(-)
Operation	NS	NS(-)	NS(-)
Transportation/Circulation			
Construction	NS	NS(-)	NS(-)
Operation	NS	NS(-)	NS(-)

(1) See pages 6-3 and 6-4 for further details.

Notes:
S = Significant
NS = Not Significant
(-) = Potential impacts are less than the proposed project.
(+) = Potential impacts are greater than the proposed project.
(=) = Potential impacts are approximately the same as the proposed project.

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