

APPENDIX P

SUMMARY OF BAAQMD REFINERIES PROPOSED CARFG2 AND RELATED CLEAN FUELS REFINERY MODIFICATIONS

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Summary CaRFG2 and Related Clean Fuels Refinery Modifications in the Bay Area Air Quality Management District:

In order to comply with the reformulated gasoline requirements of the federal Clean Air Act Amendments (CAAA) of 1990 and the California Air Resources Board (ARB) CaRFG2 requirements, major refiners in the BAAQMD proposed modifications to their operations generally under the name of Clean Fuels Projects. These modifications were to comply with federally mandated reformulated gasoline requirements by January 1, 1995 and California mandated reformulated gasoline requirements by March 1, 1996.

Generally, the strategy of the refiners was to implement new construction and modifications to existing facilities in stages to maintain current gasoline production levels while transitioning operations to produce reformulated fuels. Most refiners did not expect any changes to the amount of crude oil to be processed with these changes. Overall, the manner in which each refinery proposed to meet the federal and state mandated requirements for reformulated gasoline would vary considering a number of factors including refinery layout, types of units, product slate, and types of crude oil processed. Existing on-site facilities, management strategy for future equipment construction and specific equipment modifications and construction timelines would all influence each project.

The following is a brief summary of the proposed Clean Fuels Projects in the BAAQMD:

CHEVRON:

Location: 841 Chevron Way Richmond, CA

Lead Agency: City of Richmond

Referenced Document: Draft Environmental Impact Report (Vol. I)

State Clearinghouse No.: 92113007 August 1993

Throughput Capacity: 245,000 barrels per day

Primary products: motor gasoline, jet & diesel fuel, lubricating oils, LPG

Facility size: ~ 2,900 acres

Construction and installation of the following units or systems that were proposed for Chevron's Clean Fuels Projects:

- | | |
|--------------------|------------------------------------|
| * Butamer Plant | * Reformate Splitting Column |
| * C4 Treating Unit | * Storage Tanks |
| * Cooling Tower | * Tertiary Amyl Methyl Ether Plant |
| * LPG Sphere | (TAME Plant) |

Modifications to the following existing units or systems that were proposed:

- | | |
|-------------------------------------|---------------------------|
| * Alkylation Plant | * Benzene Reduction Unit |
| * C4's Selective Hydrogenation Unit | * Depropanizer |
| * Debutanizer | * Deisobutanizer Column |
| * FCC Gasoline Hydrotreating Plant | * Flare System |
| * Fluid Catalytic Cracking Unit | * Hydrogen Recovery Plant |
| * Sulfur Plant | |

EXXON (VALERO):

Location: 3400 East 2nd Street Benicia, CA

Lead Agency: City of Benicia

Referenced Document: Draft Environmental Impact Report

State Clearinghouse No.: 93C0336A September 1993

Throughput Capacity: ~ 135,000 barrels per day

Primary products & production: gasoline (110,000 bpd), jet fuel (20,000 bpd), diesel fuel (15,000 bpd), and smaller amounts of other products.

Facility size: ~ 800 acres

Construction and installation of the following units or systems that were proposed for Exxon's Clean Fuels Projects:

- | | |
|---------------------------------|----------------------|
| * Benzene Reduction Unit | * C5/C6 Splitter |
| * Catalytic Reforming Unit | * Methanol Feed Tank |
| * Mid-Barrel Treater | * MTBE Process Unit |
| * Selective Catalytic Reduction | * Storage Tanks |
| * Methanol Feed Tank | * Hot Oil System |

Modifications to the following existing units or systems that were proposed:

- | | |
|-------------------|----------------------|
| * Alkylation Unit | * Hydrogen Furnaces |
| * Hydrogen Plant | * Hydrocracking Unit |

SHELL (EQUILON):

Location: 3485 Pacheco Blvd Martinez, CA

Lead Agency: Contra Costa county

Referenced Document: Draft Environmental Impact Report (Vol. I)

State Clearinghouse No.: 92093028 May 1993

Throughput Capacity: 154,000 barrels per day (?)

Primary products: gasolines, jet fuel, diesel, petroleum gases, coke, sulfur

Facility size: 881 acres

The construction of new units and proposed modifications for Shell's Clean Fuels Projects included installation of the following items:

- | | |
|-----------------------------|----------------------------------|
| * Alkylation Unit | * Cooling Tower |
| * Benzene Reduction Unit | * Distillation Unit |
| * Boilers | * Flare System |
| * Butane Isomerization Unit | * Hydrogen Plant |
| * C5/C6 Isomerization Unit | * Hydrotreaters |
| * Catalytic Reforming Unit | * Light Cracked Gasoline Treater |
| * Cogeneration Unit | * Storage Tank |
| * Coking Unit | * Sulfur Recovery Plant |

TOSCO (ULTRAMAR DIAMOND SHAMROCK):

Location: 150 Solano Ave Avon, CA

Lead Agency: Contra Costa county

Referenced Document: Draft Environmental Impact Report (Vol. I)

State Clearinghouse No.: 93111061 July 1994

Throughput Capacity: 145,000 barrels per day

Primary products: gasoline, jet fuel, diesel fuel

Facility size: 2,200 acres

Construction and installation of the following units or systems that were proposed for Tosco's Clean Fuels Projects:

- | | |
|-----------------------------------|------------------------------|
| * Benzene Saturation Unit | * FCC Hydrodesulfurizer Unit |
| * Light Naptha Hydrodesulfurizer | * Storage Tanks |
| * Selective Hydrogenation Unit | * Boiler Plant |
| * Tertiary Amyl Methyl Ether Unit | * Butane Isomerization Unit |

Modifications to the following existing units or systems that were proposed:

- | | |
|-------------------------------|--------------------------|
| * Alkylation Plant | * Hydrocracker |
| * Catalytic Hydrodesulfurizer | * Hydrogen Plant |
| * Crude Unit | * MTBE Unit |
| * Flare System | * Reformate Fractionator |
| * Gas Plant Fractionator | * Storage Tanks |

UNOCAL (PHILLIPS):

Location: 1380 San Pablo Ave. Rodeo, CA

Lead Agency: Contra Costa county

Referenced Document: Draft Environmental Impact Report (Vol. I)

State Clearinghouse No.: 93121027 June 1994

Throughput Capacity: 73,000 barrels per day (?)

Primary products: gasoline, diesel, jet fuel, fuel oil, refinery fuel

Facility size: 1,100 acres

Construction and installation of the following units or systems that were proposed for Unocal's Clean Fuels Projects in Rodeo, unless otherwise noted:

- | | |
|--------------------------|------------------------------|
| * Benzene Reduction Unit | * Hydrogen Plant |
| * Boilers | * Isomerization Unit |
| * Cooling Tower | * Reformate Splitting Column |
| * Deisopropanizer | * Storage Tanks |
| * Gasoline Blending | |