

December 2001

SCH No. 2000061113

**ULTRAMAR, INC.**

**WILMINGTON REFINERY**

**CARB PHASE 3 PROPOSED PROJECT**

**FINAL ENVIRONMENTAL IMPACT REPORT**

**VOLUME I: Final Environmental Impact Report**

**Executive Officer**

Barry Wallerstein, D. Env.

**Deputy Executive Officer,**

**Planning, Rule Development, and Area Sources**

Elaine Chang, DrPH

**Assistant Deputy Executive Officer,**

**Planning, Rule Development, and Area Sources**

Laki Tisopoulos, Ph.D, P.E.

**Manager**

**Planning, Rule Development, and Area Sources**

Alene Taber, AICP

Submitted to:

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT**

Prepared by:

**ENVIRONMENTAL AUDIT, INC.**

**Reviewed by:** Jonathan D. Nadler - Air Quality Specialist

Steve Smith, Ph.D. - Program Supervisor

Frances Keeler - Senior Deputy District Counsel



# TABLE OF CONTENTS

---

## SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT GOVERNING BOARD

Chairman: DR. WILLIAM A. BURKE, Ed.D.  
Speaker of the Assembly Representative

Vice Chairman: NORMA J. GLOVER  
Councilmember, City of Newport Beach  
Cities Representative, Orange County

### MEMBERS

MICHAEL D. ANTONOVICH  
Supervisor, Fifth District  
Los Angeles County Representative

HAL BERNSON  
Councilmember, City of Los Angeles  
Cities Representative, Los Angeles County, Western Region

JANE CARNEY  
Senate Rules Committee Appointee

BEATRICE J. S. LAPISTO – KIRTLEY  
Councilmember, City of Bradbury  
Cities Representative, Los Angeles County, Eastern Region

RONALD O. LOVERIDGE  
Mayor, City of Riverside  
Cities Representative, Riverside County

JON D. MIKELS  
Supervisor, Second District  
San Bernardino County Representative

LEONARD PAULITZ  
Councilmember, City of Montclair  
Cities Representative, San Bernardino County

JAMES A. SILVA.  
Supervisor, Second District  
Orange County Representative

CYNTHIA VERDUGO-PERALTA  
Governor's Appointee

S. ROY WILSON, Ed.D.  
Supervisor, Fourth District  
Riverside County Representative

### EXECUTIVE OFFICER

BARRY WALLERSTEIN, D. Env.

**TABLE OF CONTENTS**

---

**TABLE OF CONTENTS**

**ULTRAMAR WILMINGTON REFINERY  
FINAL ENVIRONMENTAL IMPACT REPORT**

<b>VOLUME I</b>	<b>Page No.</b>
<b>1.0 INTRODUCTION AND EXECUTIVE SUMMARY</b> .....	1-1
INTRODUCTION .....	1-1
PURPOSE/LEGAL REQUIREMENT .....	1-2
SCOPE AND CONTENT .....	1-2
LEAD AND RESPONSIBLE AGENCIES .....	1-3
INTENDED USES OF THE EIR .....	1-4
CHAPTER 2 SUMMARY - PROJECT DESCRIPTION .....	1-4
Project Applicant .....	1-4
Project Description.....	1-4
CHAPTER 3 SUMMARY - EXISTING ENVIRONMENTAL SETTING.....	1-5
Air Quality .....	1-5
Geology/Soils.....	1-6
Hazards and Hazardous Materials .....	1-6
Hydrology/Water Quality .....	1-7
Land Use/Planning.....	1-7
Noise .....	1-7
Solid/Hazardous Waste.....	1-7
Transportation/Traffic.....	1-8
CHAPTER 4 SUMMARY - ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES .....	1-8
Unavoidable Significant Adverse Impacts.....	1-8
Less Than Significant Impacts.....	1-9
CHAPTER 5 SUMMARY - CUMULATIVE IMPACTS.....	1-10
CHAPTER 6 SUMMARY - PROJECT ALTERNATIVES .....	1-10
CHAPTER 7 AND 8 SUMMARY - REFERENCES AND ACRONYMS AND GLOSSARY .....	1-10
<b>2.0 PROJECT DESCRIPTION</b> .....	2-1
PROJECT OBJECTIVES .....	2-1
REGULATORY BACKGROUND .....	2-1
NEED FOR EMISSION REDUCTIONS .....	2-4
PROJECT LOCATION.....	2-5
LAND USE AND ZONING.....	2-5
EXISTING REFINERY CONFIGURATION AND OPERATION .....	2-8
PROPOSED PROJECT MODIFICATIONS.....	2-8
Modifications to Existing Units .....	2-8
Fluid Catalytic Cracking Unit.....	2-8
Light Ends Recovery Unit/Naphtha Hydrotreater Unit .....	2-13

# TABLE OF CONTENTS

---

## VOLUME I

Page No.

Olefin Treater .....	2-14
Fuel Gas Mercaptan Extraction Unit .....	2-14
Storage Tank Modifications.....	2-14
Changes to Gasoline Distribution System .....	2-14
Changes to Material Transport.....	2-15
Pipelines .....	2-15
Truck Loading Rack .....	2-15
Other Modifications .....	2-15
CONSTRUCTION OF THE PROPOSED PROJECT .....	2-17
Construction Schedule .....	2-17
Labor Force .....	2-17
OPERATION OF THE PROPOSED PROJECT .....	2-17
PERMITS AND APPROVALS.....	2-17
Federal Approvals .....	2-17
State Approvals .....	2-17
Local Approvals.....	2-19
<b>3.0 EXISTING ENVIRONMENTAL SETTING .....</b>	<b>3-1</b>
INTRODUCTION .....	3-1
A. AIR QUALITY.....	3-1
Meteorological Conditions.....	3-1
Temperature & Rainfall .....	3-1
Wind Flow Patterns.....	3-2
Existing Air Quality .....	3-2
Criteria Pollutants .....	3-2
Regional Air Quality.....	3-4
Local Air Quality .....	3-4
Refinery Criteria Pollutant Emissions .....	3-4
Toxic Air Contaminants.....	3-6
Refinery Baseline Health Risk Assessment.....	3-8
Regulatory Background .....	3-15
Federal Regulations .....	3-15
California Regulations .....	3-15
Local Regulations .....	3-16
B. GEOLOGY/SOILS .....	3-17
Topography and Soils .....	3-17
Earthquake Faults.....	3-17
San Andreas Fault Zone.....	3-18
The Newport-Englewood Fault Zone .....	3-18
Malibu-Santa Monica-Raymond Hills Fault Zone .....	3-20
The Palos Verdes Fault Zone .....	3-20
Whittier-Elsinore Fault Zone .....	3-20
Sierra Madre Fault System.....	3-20
San Fernando Fault .....	3-21

# TABLE OF CONTENTS

---

## VOLUME I

Page No.

Elysian Park Thrust System .....	3-21
Torrance-Wilmington Fault Zone .....	3-21
Earthquake Probability.....	3-21
Liquefaction .....	3-22
Other Geological Issues .....	3-23
Subsidence .....	3-23
On-Site Wells.....	3-23
Regulatory Background .....	3-23
C. HAZARDS AND HAZARDOUS MATERIALS .....	3-24
Types of On-Site Hazards.....	3-25
Toxic Gas Clouds.....	3-25
Torch Fires, Flash Fires, Pool Fires & Vapor Cloud Explosions .....	3-25
Thermal Radiation .....	3-25
Explosion/Overpressure.....	3-25
Other Refinery Hazards .....	3-26
Hazards Related to MTBE.....	3-26
Transportation Risks .....	3-26
Pipeline Hazards .....	3-29
Regulatory Background .....	3-30
D. HYDROLOGY/WATER QUALITY .....	3-31
Ground Water Quality.....	3-31
MTBE in Ground Water .....	3-33
Surface Water Quality Setting .....	3-35
Storm Water .....	3-35
Spill Control and Containment .....	3-36
Wastewater.....	3-36
Regulatory Background .....	3-37
E. LAND USE/PLANNING .....	3-38
Regional Land Use and Zoning .....	3-38
Regional Plans and Policies .....	3-38
Project Site Land Use and Zoning .....	3-39
General Plans .....	3-45
Sensitive Land Uses.....	3-46
Regulatory Background .....	3-46
F. NOISE.....	3-47
Existing Noise Levels .....	3-48
Regulatory Background .....	3-53
G. SOLID/HAZARDOUS WASTE .....	3-56
Non-Hazardous Solid Waste.....	3-56
Regulatory Background .....	3-57

# TABLE OF CONTENTS

---

## VOLUME I

Page No.

H. TRANSPORTATION/TRAFFIC .....	3-58
Regional Circulation .....	3-58
Local Circulation .....	3-59
Regulatory Background .....	3-59
<b>4.0 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES .....</b>	<b>4-1</b>
INTRODUCTION .....	4-1
A. AIR QUALITY .....	4-1
Significance Criteria .....	4-1
Construction Emission Impacts .....	4-4
Construction Equipment .....	4-4
Equipment Delivery/On-Site Travel .....	4-5
Heavy Diesel Trucks .....	4-5
Construction Workers Commuting .....	4-6
Fugitive Dust Associated with Site Construction Activities .....	4-6
Fugitive Dust Associated with Travel on Paved and Unpaved Roads .....	4-6
Architectural Coatings .....	4-6
Miscellaneous Emissions .....	4-7
Construction Emission Summary .....	4-7
Operational Emission Impacts .....	4-7
Stationary Source Emissions .....	4-8
Process Pumps .....	4-9
Process Valves .....	4-9
Process Drains .....	4-10
Flanges .....	4-10
Pressure Relief Devices (PRDs) .....	4-10
Indirect Emissions .....	4-10
Truck Trips .....	4-10
Worker Travel .....	4-10
Railcars .....	4-11
Marine Vessels .....	4-11
Operational Emission Summary .....	4-11
CO Hot Spots .....	4-11
Air Quality Management Plan .....	4-13
Odors .....	4-13
Toxic Air Contaminants .....	4-13
Hazard Identification .....	4-13
Emission Estimations and Sources .....	4-14
HRA Methodology .....	4-15
Proposed Project HRA Results - Carcinogenic Health Impacts .....	4-15
Maximum Exposed Individual Worker .....	4-15
Maximum Exposed Individual Resident .....	4-15
Cancer Burden .....	4-15
Sensitive Receptors .....	4-15

## VOLUME I

Page No.

**TABLE OF CONTENTS**

---

Proposed Project HRA Results – Non Carcinogenic

Health Impacts ..... 4-17

    Chronic Hazard Index ..... 4-17

    Acute Hazard Index ..... 4-17

Mitigation Measures ..... 4-17

    Construction Mitigation Measures ..... 4-17

    Operational Mitigation Measures ..... 4-19

Level of Significance After Mitigation ..... 4-21

    Construction ..... 4-21

    Operation ..... 4-21

B. GEOLOGY/SOILS ..... 4-21

    Significance Criteria ..... 4-21

    Proposed Project Impacts ..... 4-23

        Construction Impacts ..... 4-23

        Operational Impacts ..... 4-25

    Mitigation Measures ..... 4-26

    Level of Significance After Mitigation ..... 4-27

C. HAZARDS AND HAZARDOUS MATERIALS ..... 4-27

    Significance Criteria ..... 4-27

    Proposed Project Impacts ..... 4-27

        Process Units ..... 4-27

        Hazard Identification ..... 4-27

        Methodology ..... 4-29

        Modeling ..... 4-29

        Results ..... 4-30

    Transportation of Hazardous Materials ..... 4-32

        Ethanol/MTBE ..... 4-33

        High Octane Blending Components ..... 4-34

        Propane/Propylene ..... 4-34

    Pipeline Hazards ..... 4-35

    Compliance Issues ..... 4-35

        Impacts on Water Quality ..... 4-36

    Mitigation Measures ..... 4-37

    Levels of Significance After Mitigation ..... 4-38

D. HYDROLOGY/WATER QUALITY ..... 4-38

    Significance Criteria ..... 4-38

        Water Quality ..... 4-38

        Water Demand ..... 4-38

    Construction Impacts ..... 4-38

    Operational Impacts ..... 4-40

        Groundwater ..... 4-40

        Surface/Storm Water Runoff ..... 4-41

        Water Demand ..... 4-41

        Wastewater ..... 4-42

**TABLE OF CONTENTS**

---

Spill Control and Containment ..... 4-42

Mitigation Measures ..... 4-42

Level of Significance After Mitigation..... 4-42

E. LAND USE/PLANNING ..... 4-43

Significance Criteria ..... 4-43

Proposed Project Impacts..... 4-43

Mitigation Measures ..... 4-44

Level of Significance ..... 4-44

F. NOISE..... 4-44

Significance Criteria ..... 4-44

Construction Impacts ..... 4-44

Operational Impacts ..... 4-47

Traffic Noise ..... 4-50

Marine Vessels..... 4-50

Mitigation Measures ..... 4-50

Level of Significance After Mitigation..... 4-50

G. SOLID /HAZARDOUS WASTE ..... 4-51

Significance Criteria ..... 4-51

Construction Impacts ..... 4-51

Operational Impacts ..... 4-51

Mitigation Measures ..... 4-52

Level of Significance After Mitigation..... 4-52

H. TRANSPORTATION/TRAFFIC ..... 4-52

Significance Criteria ..... 4-52

Construction Impacts ..... 4-53

Operational Impacts ..... 4-55

Mitigation Measures ..... 4-56

Level of Significance After Mitigation..... 4-56

**5.0 CUMULATIVE IMPACTS ..... 5-1**

A. INTRODUCTION ..... 5-1

LOCAL REFINERIES..... 5-1

1. Tosco..... 5-1

2. Exxon-Mobil..... 5-4

3. Equilon..... 5-5

4. Chevron..... 5-6

5. ARCO ..... 5-7

Other Related Projects ..... 5-8

6. Previously Proposed Metro 2000 Site..... 5-8

7. Port of Los Angeles (POLA)/Port of Long Beach 2020 Plan..... 5-9

8. Alameda Corridor Transportation Authority (ACTA)..... 5-10

Dominguez Channel Project ..... 5-11

Henry Ford Avenue Grade Separation..... 5-11

Alameda Street Widening ..... 5-12

**TABLE OF CONTENTS**

---

Henry Ford Avenue Widening..... 5-12  
 Pacific Coast Highway Grade Separation..... 5-12  
 Street Improvements by Other Agencies ..... 5-12  
 9. Sepulveda Boulevard Improvement..... 5-13  
 10. 223<sup>rd</sup> Street Re-Development Projects..... 5-13  
 11. City of Long Beach..... 5-13  
 12. Third Party Terminals ..... 5-14  
**B. AIR QUALITY** ..... 5-14  
     Construction Impacts ..... 5-14  
     Operational Impacts – Criteria Pollutants..... 5-15  
     Operational Impacts – Toxic Air Contaminants ..... 5-20  
     Ultramar Post-Project Scenario..... 5-20  
         Hazard Identification ..... 5-20  
         Emission Estimations and Sources ..... 5-20  
         HRA Methodology..... 5-20  
         Post-Project HRA Results – Carcinogenic Health Impacts ..... 5-21  
             Maximum Exposed Individual Worker ..... 5-21  
             Maximum Exposed Individual Resident..... 5-22  
             Cancer Burden ..... 5-24  
             Sensitive Receptors..... 5-26  
         Post-Project HRA Results – Non-Carcinogenic Health Impacts ..... 5-26  
             Chronic Hazard Index ..... 5-26  
             Acute Hazard Index ..... 5-26  
     TAC Impacts from Other Proposed Projects ..... 5-26  
     Mitigation Measures ..... 5-28  
     Level of Significance After Mitigation..... 5-29  
**C. GEOLOGY/SOIL** ..... 5-30  
     Project Impacts..... 5-30  
         Seismicity..... 5-30  
         Contaminated Soils ..... 5-31  
     Mitigation Measures ..... 5-32  
     Level of Significance After Mitigation..... 5-32  
**D. HAZARDS AND HAZARDOUS MATERIALS** ..... 5-32  
     Project Impacts..... 5-32  
     Mitigation Measures ..... 5-33  
     Level of Significance After Mitigation..... 5-33  
**E. HYDROLOGY/WATER QUALITY** ..... 5-34  
     Ground Water..... 5-34  
     Surface Water..... 5-34  
     Water Demand ..... 5-35  
     Wastewater..... 5-35  
     Mitigation Measures ..... 5-36  
     Level of Significance After Mitigation..... 5-36

**TABLE OF CONTENTS**

---

F. LAND USE/PLANNING ..... 5-36  
     Mitigation Measures ..... 5-37  
     Level of Significance ..... 5-37  
 G. NOISE..... 5-37  
     Construction Impacts ..... 5-37  
     Operational Impacts ..... 5-38  
     Mitigation Measures ..... 5-38  
     Level of Significance After Mitigation..... 5-38  
 H. SOLID/HAZARDOUS WASTE ..... 5-39  
     Hazardous Waste ..... 5-39  
     Non-Hazardous Waste ..... 5-39  
     Mitigation Measures ..... 5-39  
     Level of Significance ..... 5-39  
 I. TRANSPORTATION/TRAFFIC ..... 5-41  
     Construction Impacts ..... 5-41  
     Operational Impacts ..... 5-41  
     Mitigation Measures ..... 5-43  
     Level of Significance After Mitigation..... 5-43

**6.0 PROJECT ALTERNATIVES ..... 6-1**  
     INTRODUCTION ..... 6-1  
     ALTERNATIVES REJECTED AS INFEASIBLE ..... 6-1  
     PROJECT ALTERNATIVES..... 6-2  
         Alternative 1 - Receipt of Ethanol via Alternate Modes of Transportation..... 6-2  
         Alternative 2 - Alternate Pipeline Routes ..... 6-2  
         Alternative 3 - Alternatives to the Storage of Propane/Propylene..... 6-3  
     ALTERNATIVES ANALYSIS..... 6-3  
         Alternative 1 – Receipt of Ethanol via Alternate Modes of Transportation ..... 6-3  
             Air Quality ..... 6-3  
             Geology/Soils..... 6-4  
             Hazards and Hazardous Materials ..... 6-4  
             Hydrology/Water Quality ..... 6-4  
             Land Use/Planning..... 6-5  
             Noise ..... 6-5  
             Solid/Hazardous Waste ..... 6-5  
             Transportation/Traffic..... 6-5  
         Alternative 2 – Alternate Pipeline Routes ..... 6-5  
             Air Quality ..... 6-5  
             Geology/Soils..... 6-5  
             Hazards and Hazardous Materials ..... 6-5  
             Hydrology/Water Quality ..... 6-6  
             Land Use/Planning..... 6-6  
             Noise ..... 6-6  
             Solid/Hazardous Waste..... 6-6

# TABLE OF CONTENTS

---

	Transportation/Traffic.....	6-6
	Alternative 3 – Alternatives to the Storage of Propane/Propylene.....	6-6
	Air Quality.....	6-6
	Geology/Soils.....	6-7
	Hazards and Hazardous Materials.....	6-7
	Hydrology/Water Quality.....	6-7
	Land Use/Planning.....	6-7
	Noise.....	6-7
	Solid/Hazardous Waste.....	6-7
	Transportation/Traffic.....	6-8
	CONCLUSION.....	6-8
<b>7.0</b>	<b>REFERENCES.....</b>	<b>7-1</b>
	REFERENCES.....	7-1
	ORGANIZATIONS AND PERSONS CONSULTED.....	7-6
	Organizations.....	7-6
	Individuals Consulted.....	7-6
	List of Environmental Impact Report Preparers.....	7-7
<b>8.0</b>	<b>ACRONYMS AND GLOSSARY.....</b>	<b>8-1</b>
	ACRONYMS AND ABBREVIATIONS.....	8-1
	GLOSSARY.....	8-5

## APPENDICES:

APPENDIX A:	NOTICE OF PREPARATION (NOP) AND COMMENTS RECEIVED ON NOP.....	A-1
APPENDIX B:	EMISSION CALCULATIONS.....	B-1
APPENDIX C:	TRAFFIC LEVEL OF SERVICE ANALYSES.....	C-1

## TABLES:

1-1	SUMMARY OF ENVIRONMENTAL IMPACTS, MITIGATION MEASURES AND RESIDUAL IMPACTS.....	1-11
2-1	STATEWIDE EMISSION BENEFITS ASSOCIATED WITH RFG PHASE 2 REGULATIONS.....	2-2
2-2	REFORMULATED GASOLINE PHASE 3 REQUIREMENTS.....	2-3
2-3	OZONE PRECURSOR CONTRIBUTION FROM MOTOR VEHICLES.....	2-4
2-4	PROPOSED REFINERY MODIFICATIONS.....	2-13
2-5	FEDERAL, STATE AND LOCAL AGENCY PERMITS AND APPLICATIONS.....	2-20
3-1	AMBIENT AIR QUALITY STANDARDS.....	3-3
3-2	AMBIENT AIR QUALITY SOUTH COASTAL LOS ANGELES COUNTY MONITORING STATION (1995-1999).....	3-5
3-3	REFINERY BASELINE CRITERIA POLLUTANT EMISSIONS.....	3-6

# TABLE OF CONTENTS

---

## TABLES: (Continued)

3-4	AMBIENT AIR QUALITY TOXIC AIR CONTAMINANTS NORTH LONG BEACH (1997-1998) .....	3-7
3-5	CANCER RISK BASED ON CARB – NORTH LONG BEACH MONITORING STATION DATA.....	3-9
3-6	EMISSIONS OF INDIVIDUAL TOXIC AIR CONTAMINANTS FROM EXISTING OPERATIONS AT THE ULTRAMAR WILMINGTON REFINERY .....	3-9
3-7	SUMMARY OF CANCER RISK .....	3-14
3-8	MAJOR ACTIVE OR POTENTIALLY ACTIVE FAULTS SOUTHERN CALIFORNIA .....	3-18
3-9	SIGNIFICANT HISTORICAL EARTHQUAKES IN SOUTHERN CALIFORNIA ..	3-22
3-10	SUMMARY OF EXISTING HAZARDS .....	3-27
3-11	TRUCK ACCIDENT RATES FOR CARGO ON HIGHWAYS.....	3-28
3-12	ULTRAMAR REFINING COMPANY PREDICTED TRUCK ACCIDENT RATES ASSOCIATED WITH THE CURRENT REFINERY OPERATIONS .....	3-29
3-13	PIPELINE SPILL PROBABILITY .....	3-30
3-14	MAXIMUM ALLOWABLE WASTEWATER CONCENTRATIONS FROM THE INDUSTRIAL WASTEWATER DISCHARGE PERMIT .....	3-37
3-15	NOISE LEVEL MEASUREMENT LOCATIONS .....	3-52
3-16	SAMPLING RESULTS BACKGROUND AMBIENT NOISE LEVELS, dBA .....	3-52
3-17	CITY OF LOS ANGELES NOISE ORDINANCE.....	3-53
3-18	CITY OF CARSON NOISE ORDINANCE THRESHOLDS .....	3-54
3-19	LOS ANGELES COUNTY LANDFILL STATUS .....	3-57
3-20	ULTRAMAR REFORMULATED FUELS PROGRAM EXISTING LEVEL OF SERVICE ANALYSIS AND VOLUME-TO-CAPACITY RATIOS .....	3-61
4-1	AIR QUALITY SIGNIFICANCE THRESHOLDS .....	4-2
4-2	RECLAIM CEQA SIGNIFICANCE THRESHOLDS FOR ULTRAMAR.....	4-3
4-3	ULTRAMAR CARB PHASE 3 PROPOSED PROJECT PEAK DAY CONSTRUCTION EMISSIONS .....	4-5
4-4	ULTRAMAR REFINERY CARB PHASE 3 PROPOSED PROJECT STATIONARY SOURCE OPERATIONAL EMISSIONS.....	4-8
4-5	ULTRAMAR REFINERY CARB PHASE 3 PROPOSED PROJECT MARINE VESSEL EMISSION REDUCTIONS.....	4-11
4-6	ULTRAMAR REFINERY STATIONARY SOURCE OPERATIONAL EMISSIONS SUMMARY .....	4-12
4-7	MAXIMUM EMISSION RATES TOXIC POLLUTANTS PROPOSED PROJECT SCENARIO.....	4-14
4-8	SUMMARY OF PROPOSED PROJECT CANCER RISK .....	4-17
4-9	PEAK DAY CONSTRUCTION EMISSIONS FOLLOWING MITIGATION.....	4-22
4-10	PROCESS UNITS AND FACILITIES INVOLVED IN THE PROPOSED PROJECT.....	4-28
4-11	ENDPOINT CRITERIA FOR CONSEQUENCE ANALYSIS .....	4-28
4-12	MAXIMUM HAZARD DISTANCES .....	4-31

# TABLE OF CONTENTS

---

## TABLES: (Continued)

4-13	HEALTH ASSESSMENT VALUES AND HEALTH PROTECTIVE CONCENTRATIONS .....	4-34
4-14	CONSTRUCTION NOISE SOURCES .....	4-45
4-15	PROJECT CONSTRUCTION NOISE LEVELS .....	4-46
4-16	PROJECT OPERATION NOISE LEVELS .....	4-49
4-17	ULTRAMAR REFINERY CONSTRUCTION TRAFFIC IMPACTS LEVEL OF SERVICE ANALYSIS AND VOLUME-TO-CAPACITY RATIOS .....	4-54
4-18	ULTRAMAR REFINERY OPERATIONAL TRAFFIC IMPACTS LEVEL OF SERVICE ANALYSIS AND VOLUME-TO-CAPACITY RATIOS .....	4-55
5-1	AVAILABLE CUMULATIVE PROJECT PEAK DAY CONSTRUCTION EMISSIONS .....	5-16
5-2	CUMULATIVE PROJECT STATIONARY AND INDIRECT SOURCES OPERATIONAL EMISSIONS .....	5-17
5-3	CARB PHASE 3 EXPECTED STATEWIDE EMISSION CHANGES .....	5-19
5-4	EMISSION SOURCE CONTRIBUTION TO CANCER RISK FOR POST PROJECT SCENARIO MEIW .....	5-21
5-5	TAC CONTRIBUTION TO CANCER RISK FOR POST-PROJECT SCENARIO MEIW .....	5-22
5-6	EMISSION SOURCE CONTRIBUTION TO CANCER RISK FOR POST PROJECT SCENARIO MEIR .....	5-23
5-7	TAC CONTRIBUTION TO CANCER RISK FOR POST-PROJECT SCENARIO MEIR .....	5-24
5-8	MAXIMUM CHRONIC HAZARD INDEX BY POLLUTANT FOR THE POST-PROJECT SCENARIO .....	5-27
5-9	MAXIMUM ACUTE HAZARD INDEX BY POLLUTANT FOR THE POST-PROJECT SCENARIO .....	5-28
5-10	SUMMARY OF HEALTH RISK FOR CUMULATIVE PROJECTS .....	5-29
5-11	CUMULATIVE OPERATIONAL TRAFFIC IMPACTS LEVEL OF SERVICE ANALYSIS AND VOLUME-TO-CAPACITY RATIOS .....	5-42
6-1	ENVIRONMENTAL IMPACTS OF ALTERNATIVES AS COMPARED TO PROPOSED PROJECT .....	6-9

## FIGURES:

2-1	REGIONAL MAP .....	2-6
2-2	PROJECT LOCATION .....	2-7
2-3	ULTRAMAR DIAMOND SHAMROCK – WILMINGTON REFINERY PLOT PLAN .....	2-9
2-4	ULTRAMAR PRE-MODIFICATION REFINERY FLOW DIAGRAM .....	2-10
2-5	ULTRAMAR DIAMOND SHAMROCK – WILMINGTON REFINERY PROPOSED REFINERY MODIFICATIONS .....	2-11
2-6	ULTRAMAR POST-MODIFICATION REFINERY FLOW DIAGRAM .....	2-12

**VOLUME I**

Page No.

# TABLE OF CONTENTS

---

## FIGURES: (Continued)

2-7	PROPOSED NEW PIPELINE ROUTES .....	2-16
2-8	CONSTRUCTION RELATED LABOR FORECAST – CARB RFG3/MTBE PHASE-OUT PROJECT .....	2-18
3-1	CANCER RISK ISOPLETH – ULTRAMAR, INC. WILMINGTON REFINERY .....	3-12
3-2	MAXIMUM IMPACT LOCATIONS ULTRAMAR, INC. WILMINGTON REFINERY .....	3-13
3-3	MAJOR FAULT SYSTEMS IN THE SOUTHERN CALIFORNIA AREA.....	3-19
3-4	ULTRAMAR PHOTOGRAPH LOCATIONS.....	3-40
3-4.1	VIEW OF REFINERY FROM ANAHEIM STREET LOOKING SOUTHWEST .....	3-41
3-4.2	VIEW OF REFINERY FROM ANAHEIM STREET LOOKING SOUTH .....	3-41
3-4.3	VIEW OF REFINERY FROM HENRY FORD LOOKING EAST .....	3-42
3-4.4	VIEW OF REFINERY FROM HENRY FORD LOOKING EAST .....	3-42
3-4.5	VIEW OF REFINERY FROM SOUTHERN PROPERTY LINE LOOKING NORTH.....	3-43
3-4.6	VIEW OF REFINERY FROM SOUTHEASTERN PROPERTY LINE LOOKING NORTHWEST.....	3-43
3-4.7	VIEW OF REFINERY FROM EASTERN PROPERTY LINE LOOKING WEST .....	3-44
3-4.8	VIEW OF REFINERY FROM EASTERN PROPERTY LINE LOOKING WEST .....	3-44
3-5	GENERAL NOISE SOURCES AND THEIR SOUND PRESSURE LEVELS .....	3-49
3-6	ULTRAMAR NOISE MEASUREMENT LOCATIONS .....	3-51
3-7	LAND USE COMPATIBILITY FOR COMMUNITY NOISE ENVIRONMENTS....	3-55
3-8	ULTRAMAR LOCAL TRANSPORTATION SYSTEM .....	3-60
4-1	PROJECT MAXIMUM IMPACT LOCATIONS – ULTRAMAR, INC. WILMINGTON REFINERY .....	4-16
4-2	UNATTENUATED NOISE LEVELS FROM PIPELINE CONSTRUCTION.....	4-48
5-1	CALIFORNIA REFINERIES REFORMULATED FUELS PROJECT .....	5-2
5-2	RELATED PROJECTS .....	5-3
5-3	CANCER RISK ISOPLETH – ULTRAMAR INC., WILMINGTON REFINERY CUMULATIVE EMISSIONS SCENARIO .....	5-25

## VOLUME II

### HEALTH RISK ASSESSMENT

## VOLUME III

### HAZARDS ANALYSIS

# **TABLE OF CONTENTS**

---

## **VOLUME IV**

### **RESPONSES TO COMMENTS**

DAB:WORD:1936EIRTOC