FINAL REPORT

TECHNICAL AND ECONOMIC ANALYSIS OF CANDIDATE RACT MEASURES FOR THE CALIFORNIA OCS: PHASE I

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1.0 Background And Introduction

The Department of Interior (DOI) is interested in evaluated the technical and economic feasibility of installing Reasonably Available Control Technologies (RACT) on existing Outer Continental Shelf (OCS) facilities offshore California. When this study began, the DOI had proposed to modify Rule 30 CFR 250.45 and 250.46 to impose special emission control requirements for facilities offshore California. During the course of the study revisions to the Federal Clean Air Act , that became effective on January 1, 1991, gave the EPA jurisdiction in controlling air emissions on portions of the OCS, of which the Pacific region is included. The 1990 Federal Clean Air Act amendments added a new section (Section 328) to Title III of the Act which covers air pollution from OCS activities.

The main requirement of this Section, is that OCS sources located in designated areas must comply with local and state requirements for emission controls, emission limitations, offsets, permitting, monitoring , testing, and reporting. This means that existing OCS sources off the coast of California will have to comply with local RACT requirements. Section 328 (a)(1) of the Clean Air Act provides 24 months for existing OCS source to comply with new requirements of the Act.

With these changes in the Clean Air Act, the DOI no longer has jurisdiction over air quality in certain parts of the OCS. However, the DOI still is interested evaluating the technical and economic effects associated with the implementation of RACT on existing OCS facilities. DOI's interest is focused in two areas:

1. To assist DOI in evaluating the need for RACT measure on OCS sources in areas where they still have jurisdiction, and

2. The evaluation will help DOI assess any safety implications associated with the implementation of RACT measures on existing OCS sources.

The DOI, through the Minerals Management Service (MMS) is responsible for overseeing and enforcing the requirements of the OCS Lands Act. Part of these responsibilities is to monitor and enforce safe practice requirements for various OCS operations. This requirement means that the MMS will need to evaluate the safety implications associated with air pollution control rules that are implemented on the OCS.

As part of this evaluation the MMS funded a study to compile data about OCS sources in the Pacific Region that would serve as a foundation for the development of specific RACT requirements for these sources. The original study was comprised of two parts:

- ***Phase I:*** Develop a complete data base and emission inventory of all Pacific Region OCS sources, including mobile sources, and to develop methodologies for evaluating the technical and economic feasibility of various RACT measures as they apply to specific OCS operations.

- ***Phase II***: Conduct a detailed technical and economic analysis of candidate RACT measures, and develop an implementation plan for each Pacific Region OCS source.

The information presented in this report covers the results of Phase I. Phase II will need to be implemented by the local air districts with input from state and Federal agencies. On the Federal level, the MMS will need to play an advisory role with regard to effect of candidate RACT measure on the safety of OCS operations.

This report is organized as follows:

- Section 2 outlines the survey coverage and results. The data base is also described.

- Section 3 addressed the platform equipment and vessel emissions.

- Section 4 discusses the onshore RACT precedent and the Phase II methodology development.

There are also four appendices. Appendix A contains the detailed data base printouts of general platform information, equipment information, and fuel use. Appendix B contains the emission rates for the platforms Appendix C contains general vessel information and emission rates. Appendix D is a sample of the survey questionnaire circled to all OCS operators. Appendix E is a listing of the text of relevant regulations. The 1990 Federal Clean Air Act title VIII Section 801 and the South Coast Air Quality Management District rules for reciprocating engines and turbines (Rules 1110.2 and 1134).

2.0 Survey Results

As part of the development of the Phase I OCS emitting equipment database, surveys were sent out to all oil and gas operators of facilities in the California OCS area. There are 21 facilities in the California OCS that will be affected by the new clean air act provisions cover RACT on the OCS. These are shown in Figure 2.1. All facilities were contacted in this study.

2.1 Survey Coverage

The distributed survey form was composed of four general areas:

- General Facility Description,
- Engine and Turbine Information Including Fuel Use,
- Vessel Information, and
- Contractor Equipment.

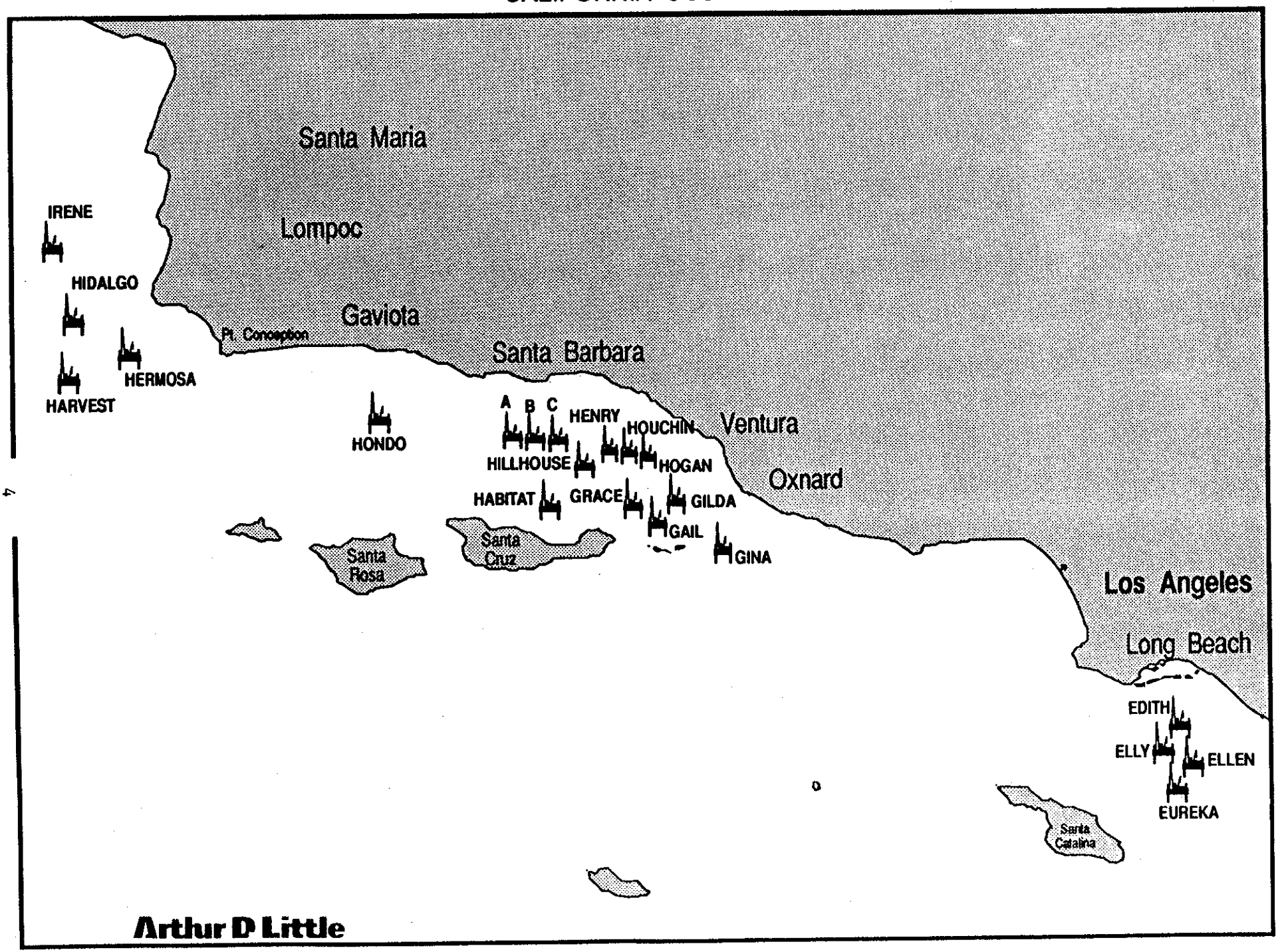
Each survey form also contained information from a database that was developed from Arthur D. Little, Inc. in-house files and the Los Angeles MMS. By including this information, the operators were able to simply verify the existing data in many cases. Surveys were intended to give only a "snap shot" of the current platform equipment and the history of its use. No attempt has been made to examine equipment which was used and subsequently removed from the platform.

The general facility description addressed such information as the platform name, the operator, the associated onshore county, the anticipated year of de-commissioning, oil and gas production over the last five years, and the different fuel types and fuel sulfur contents used on the platform.

Engine and turbine information addressed the engine and turbine manufacturers, size, model number and configurations. Actual fuel use was also obtained from 1985 through 1989 as well as a projected 1990 fuel use. These fuel use levels were used in the database to estimate emissions using fuel based emission factors.

Since the revised clean air act covers OCS activities addresses vessels, information was obtained on the vessels which visit each platform. That information included engine type,

FIGURE 2.1
CALIFORNIA OCS FACILITIES



model number, manufacturer, configuration, and actual fuel use for four years, plus a 1990 projected fuel use value.

Information on contractor equipment was also obtained. This included equipment such as cement pumps and logging units that are used on the platforms by contractors. The level of contractor equipment is usually highest when drilling occurs. Information on engine types, model numbers, manufacturers and fuel use was obtained.

2.2 Survey Responses/Results

The operator responses to the surveys were varied. As expected there were a number of holes that had to be filled. Some operators did not report fuel use, which was obviously an important oversight. Other data, such as equipment configurations and year of decommissioning, were also frequently missing. As expected, the year of decommissions is a difficult number to assess because of the influence of oil prices on the economics, and therefore the life, of the facility. Therefore, for the year of decommissioning, the 1988 MMS Pacific Region Report, with the assumption of a 30 year platform life was used when the operator did not provide the information. This information will be required in Phase II to develop a Net Present Value (NPV) cost effectiveness, and is discussed in more detail in Section 4.5. The platform visits confirmed that the information reported contained few inaccuracies.

Much confusion surrounded the vessel sections of the surveys. Some operators reported vessels visiting their platforms that were not reported by other platforms reporting on the same vessels. Some vessels visited as many as seven platforms. Also, some vessels were reported to visit state water platforms as well. Because of these factors, it is difficult to assign vessel emissions to specific platforms. Instead, a vessel "pool" was developed which lists each vessel that has activity in the OCS and the emissions associated with each vessel. In order to complete this list, a number of vessel operators were contacted to fill out the relative sections of the survey form for the vessels they operate.

Holes remaining in the data included the lack of fuel use information on two of the 20 vessels. The vessel operators or the platform operators, who generally supply the vessels with their fuel, were unable to supply the information. Also, equipment fuel use on the four Chevron Platforms Gail, Grace, Hermosa and Hidalgo, is still being obtained. In the meantime, some equipment fuel use information is available from the MMS database.

2.3 Database Organization

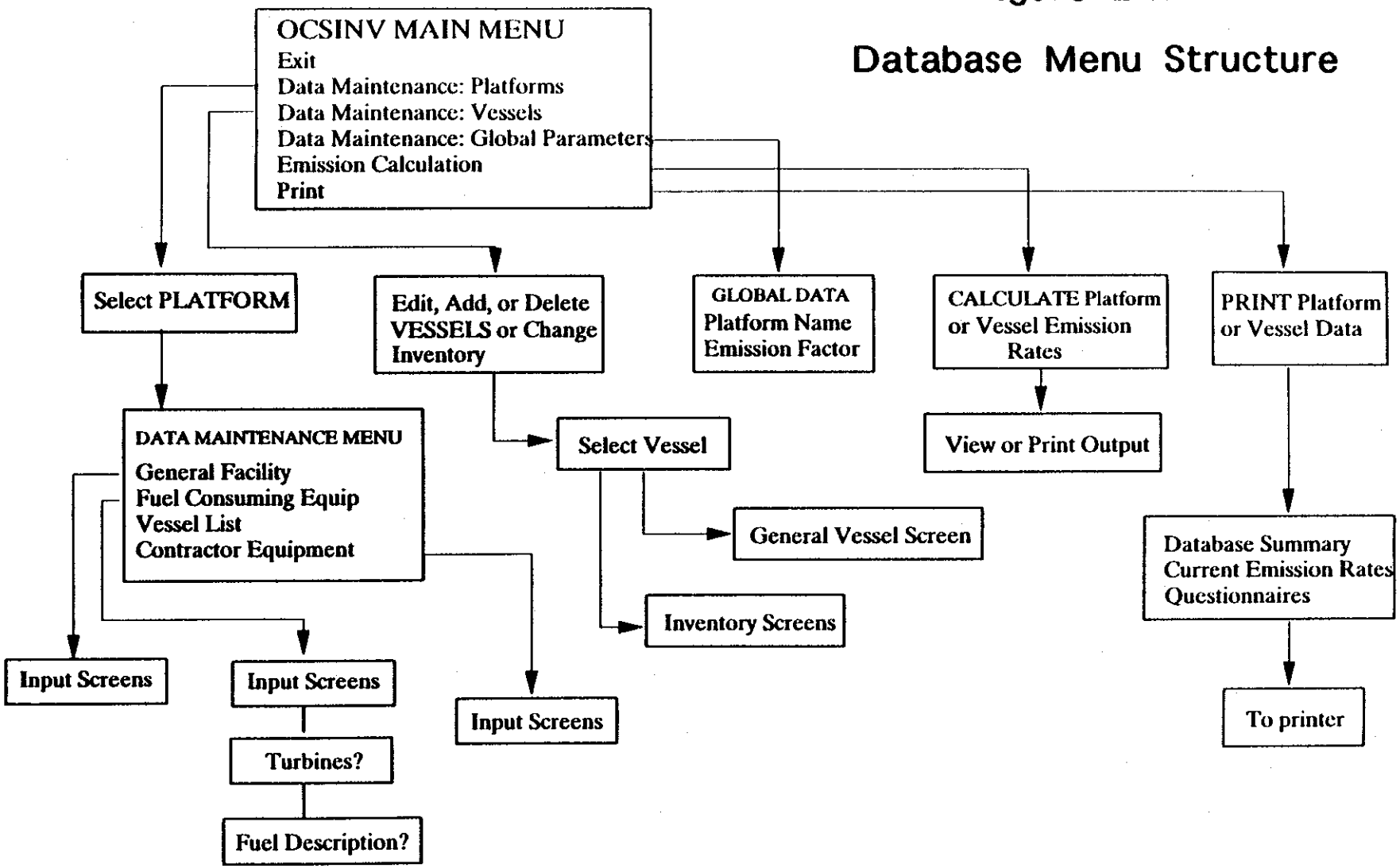
The information obtained from the surveys, Arthur D. Little, Inc. in-house files and the Los Angeles MMS, is compiled in a database that allows for easy menu-driven access. DBASE IV is used as the programming environment. The database is grouped into three areas:

1. General Platform Information
2. Equipment Information
3. Emission Rates

These areas generally correspond to the survey form organization. The database has a series of menus which will allow for the easy changing of current information, the addition of facilities and the modification of emissions factors. Emission factors are assigned a specific code which is then assigned to each piece of equipment. The database has a pop-up menu system for the selection of the appropriate emission factor. Figure 2.2 shows the database menu structure. Appendix F contains a set of computer disks with the DBASE IV program and data files.

Figure 2-2

Database Menu Structure



3.0 Emissions Prioritization

The emissions associated with oil and gas development in the California OCS are quantified from the survey fuel use information and the appropriate fuel based emission factors. By examining the emissions associated with each piece of equipment, the equipment can be classified into major and minor emitters. In Phase II, this division is proposed to conserve resources with the major emitters being examined more thoroughly to determine appropriate control technologies.

This section addresses the factors used to estimate equipment emissions and discusses the platform equipment emissions and vessel emissions.

3.1 Emission Factors

The emission factors used in the database were mostly obtained from the Los Angeles MMS. The MMS has been obtaining fuel consumption information from the OCS operators and has a spreadsheet to calculate emissions. In general, these emission factors have been agreed upon by the platform operators. In two cases, however, the emission factors did not reflect the existence of control technologies. Platform Harvest has two engines equipped with oxidation catalysts and Platform Habitat has a Copper Bessemer engine that is equipped with Clean-Burn engine technology. The oxidation catalyst was assumed to reduce the engine hydrocarbon and carbon monoxide emissions by 50 percent. This is a lower level of reduction than the manufacturer's specifications for the catalyst reduction capabilities at optimum operating conditions, but this level was assumed to be typical in the absence of source test data. The clean-burn conversion on the Cooper engine was assumed to reduce NO_x emission by 90 percent based on two other Cooper engines in Santa Barbara County that also have clean-burn conversion kits which have been source tested. These are located on Platform Hope and at the Chevron Carpenteria Gas Plant and are currently reducing NO_x emission by 90 percent, according to recently obtained source tests.

The emission factors used for each piece of equipment are listed in Appendix B. The emission factors are designated by codes in the database, thereby allowing for easier changes or substitutions.

3.2 Platform Equipment Emissions

The figures in the following sections are only for NO_x and Total Hydrocarbon (THC) emissions. These two pollutants are considered to be the most significant of the criteria pollutants as they both participate in the photochemical production of ozone. Emissions of CO, SO_2 and TSP are tabulated in Appendix B. Emissions have been averaged over five years. Where five years of data were not available, emissions were averaged over the available years of data.

NO_x Emissions

The NO_x emissions from the equipment on each platform are shown graphically in Figure 3.1. There is a significant range of emissions with the turbines far outdistancing the other types of equipment in terms of NO_x emissions. Two platforms, Ellen and Eureka, rely on rig generators to produce platform power. These generators are 800 horsepower Caterpillar diesel engines as opposed to duel fuel turbines. For platforms which do not have turbines or rig generators, the main NO_x emitters are diesel engine powered cranes. Average current NO_x emissions from the OCS platform group are about 815 tons/year.

Figure 3.2 shows the NO_x emissions by equipment type for the entire OCS platform group. Turbines are responsible for 79.6 percent of the NO_x emissions, followed by diesel powered rig generators at 7.7 percent, diesel powered cranes at 5.6 percent and contractor equipment at 3.0 percent. All contractor equipment has been brought together into one category in order to give an idea of its contribution to emissions. All contractor equipment is powered by diesel engines (for tabular format, please see Appendix B).

THC Emissions

The THC emissions associated with the equipment on each platform is shown in Figure 3.3. Vents and turbines are responsible for the majority of THC emissions on the platforms where they are located. Vents are located on 9 of the 21 platforms. On platforms without vents or turbines, THC emissions are due to diesel powered rig generators and cranes. Average THC emissions from the OCS platform group are about 1,660 tons/year.

Figure 3.2 shows the THC emissions by equipment type for the entire OCS platform group. Vents are responsible for 92.9 percent of the THC emissions followed by turbines at 6.5 percent.

FIGURE 3.1
PLATFORM EQUIPMENT NOx EMISSIONS

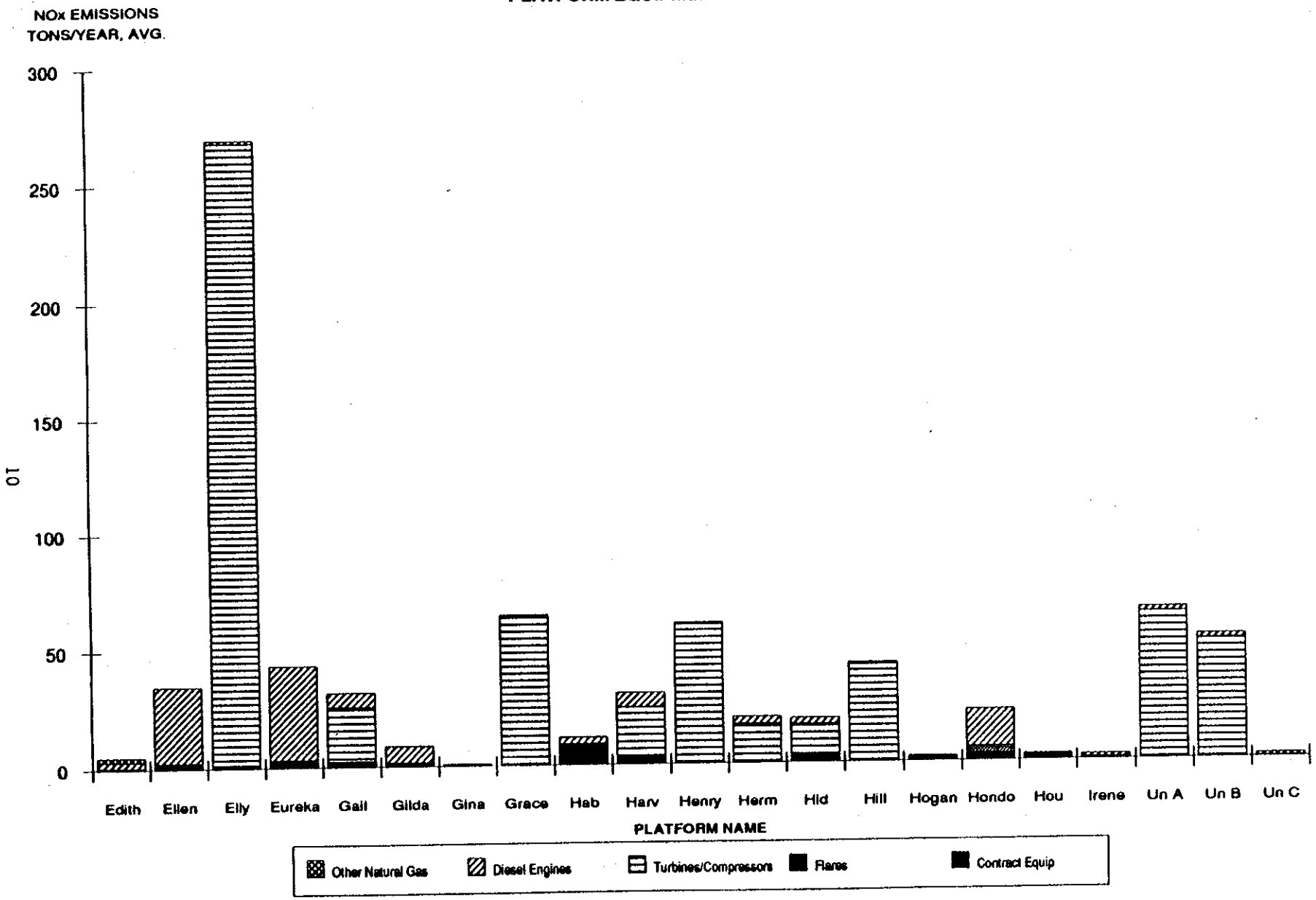


FIGURE 3.2
PLATFORM EQUIPMENT EMISSIONS
BY EQUIPMENT TYPE

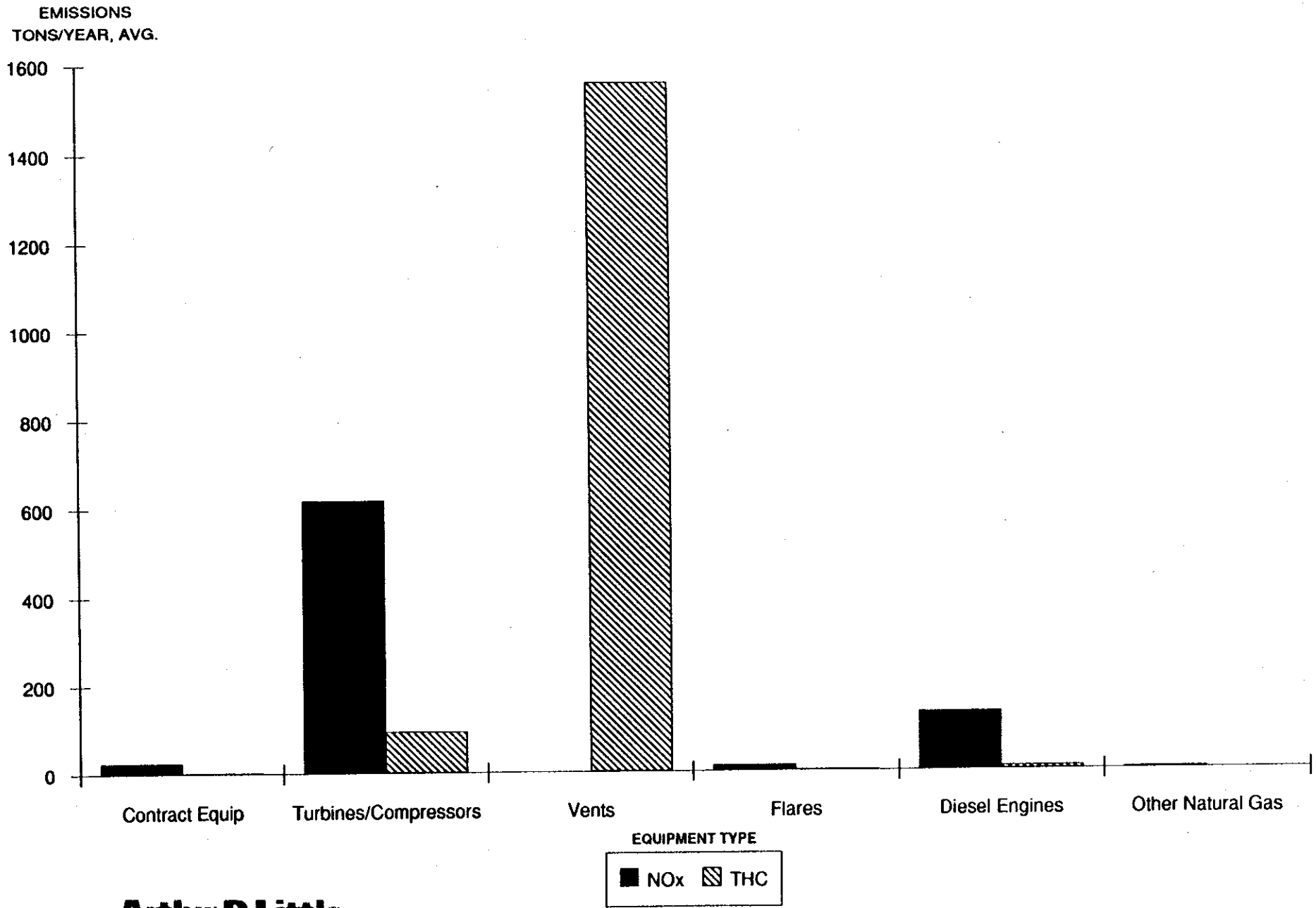
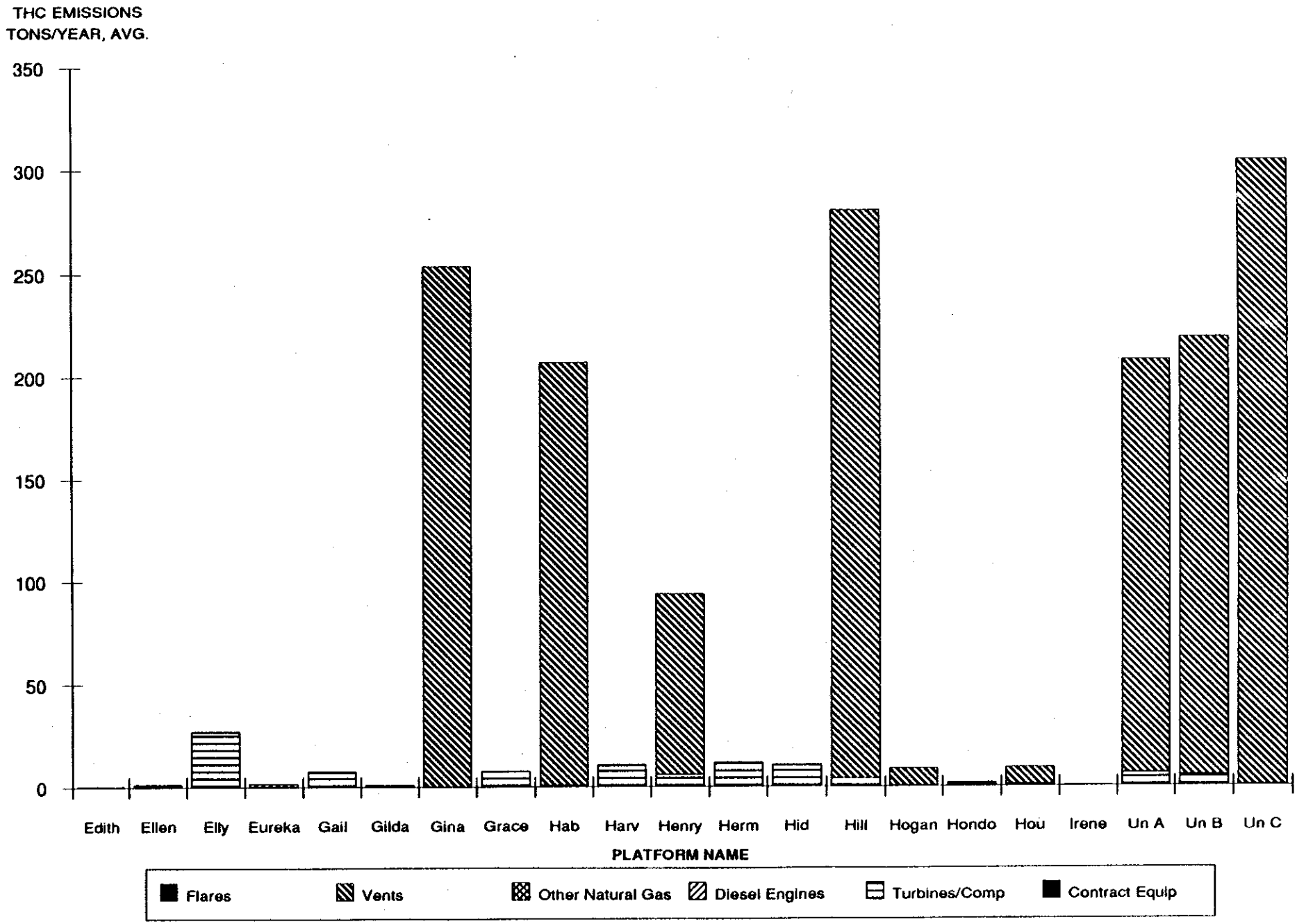


FIGURE 3.3
PLATFORM EQUIPMENT THC EMISSIONS



SO_2, CO, TSP

Emissions of SO_2, CO and TSP from the OCS platform group average 222, 266 and 48 tons/year averaged over five years, respectively. More detail on these pollutant emission levels can be found in Appendix B.

3.3 Marine Vessel Emissions

The vessel "pool" that was developed as a part of the database revealed 20 vessels servicing the California OCS platforms. Of these vessels, seven service state-water platforms also. A matrix associating each vessel with the platforms that it services is shown in Figure 3.4. Because of the difficulty in dividing the emissions between those attributable to OCS service or state-water service, total emissions are tabulated here. Total emissions is only expected to be minimally higher than the emissions associated with OCS service only due to the following:

1. OCS platforms are much farther offshore than state-water platforms, and since the majority of fuel is used during cruise mode, or transport, the OCS facilities will dominate the total emissions.

3. Boats may service state-water platforms on the way to servicing OCS platforms. Therefore, the emissions to service both the state-water platform and the OCS platform may be almost the same as the emissions to service just the OCS platform.

Figure 3.5 shows the NO_x and THC emissions from vessels servicing the OCS platforms. Sixteen of these vessels are currently controlled for NO_x emissions. Eleven utilize enhanced intercooling and 4° injection timing retard, giving about a 40 percent NO_x reduction. The other five are equipped with enhanced intercooling which produces about a 20 percent NO_x reduction. Enhanced intercooling involves cooling the engine intake air after the turbocharger using an exchanger with seawater or an internal loop through the keel of the boat. Retarding the diesel fuel injection by 4° involves injecting the diesel fuel into the combustion chamber slightly later than is required for optimum power. This allows for lower combustion temperature and therefore lower NO_x emissions.

Total NO_x emissions from the vessel pool average about 348 tons annually, based on fuel use obtained for 1985 through 1989, and on a projected 1990 value. This is equal to about 43 percent of the NO_x emissions from the OCS platforms.

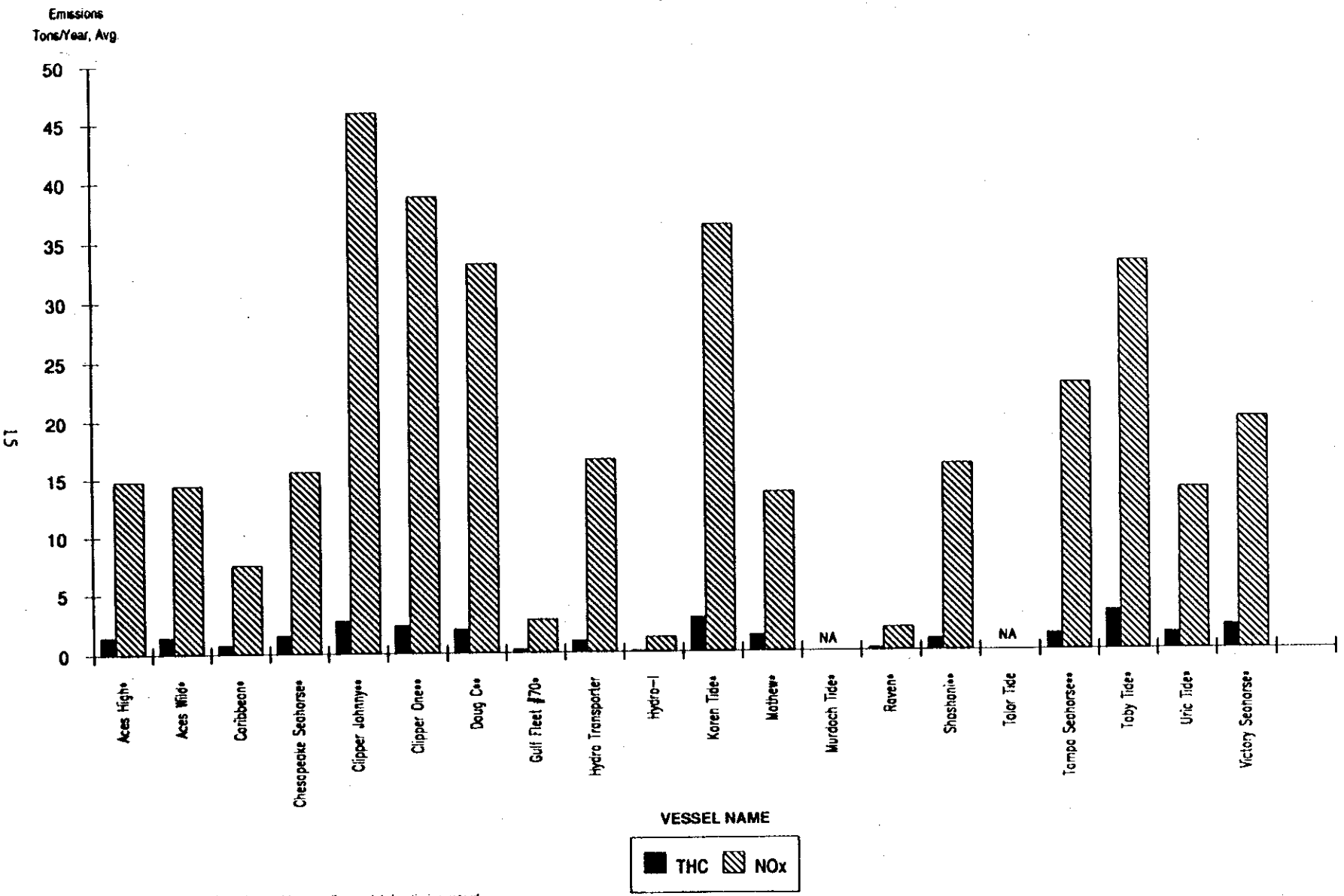
FIGURE 3.4
VESSELS BY PLATFORM

Vessel Name	PLATFORM NAME																		Union			State Water Visits
	Edith	Ellen	Elly	Eureka	Gail	Gilda	Gina	Grace	Hab	Harv	Henry	Herm	Hid	Hill	Hogan	Hondo	Houch	Irene	A	B	C	
Aces High*																■						
Aces Wild*																■			■	■	■	
Carabbean*																			■	■	■	
Chesapeake Seahorse*	■					■	■											■	■	■	■	■
Clipper Johnny**						■	■															
Clipper One**																			■	■	■	
Doug G**		■	■	■																		■
Gulf Fleet #70*	■					■	■											■	■	■	■	■
Hydro Transporter	■																					■
Hydro-I	■																					■
Karen Tide*											■			■	■		■					
Mathew*									■													
Murdoch Tide*					■				■													
Raven*									■													
Shoshoni**						■	■															
Talor Tide									■													
Tampa Seahorse**		■	■	■																		■
Toby Tide*										■												
Uric Tide*						■	■												■	■	■	
Victory Seahorse*	■					■	■											■				■

* These vessels are currently equipped with enhanced intercooling and 4 degree timing retard to produce about a 40% NOx emission reduction

** These vessels are currently equipped with enhanced intercooling to produce about a 20% NOx emission reduction

FIGURE 3.5
CALIFORNIA OCS VESSELS NOx AND THC EMISSIONS
TONS/YEAR, FIVE YEAR AVERAGE



* *These vessels currently controlled with enhanced intercooling and 4 deg timing retard.*

** *These vessels currently controlled with enhanced intercooling.*

NA = Data not available

THC emissions from the vessels are estimated to average about 27 tons/year since 1986. This is about 1.6 percent of the THC emissions from the OCS platforms. The emissions from two of the 20 vessels for which fuel use was not obtained are not included in these numbers.

Emissions of SO_2, CO and TSP from the vessel pool averages about 13, 34 and 41 tons/year, respectively. More detail on these pollutants is given in Appendix C.

3.4 Contractor Equipment Emissions

Contractor equipment is equipment used on a platform on a nonpermanent basis. This equipment is typically used for activities such as drilling and/or repairs. The equipment may only be on the facility for less than a year and is owned and frequently operated by someone other than the platform owner/operator. The extent of usage of contractor equipment depends upon the development stage of the platform. Platforms that are relatively new, such as Habitat, have a lot of contractor equipment activity. Older platforms such as Union A tend to have less contractor equipment on use.

Ten of the 21 platforms reported contractor equipment in their survey forms. This does not necessarily mean that the other facilities have not had contractor equipment since 1986, but that no equipment currently is being used on the facility.

Table 3.1 is a listing of the contractor equipment by type and engine manufacturer as reported in the survey questionnaires. All contractor equipment is powered by diesel engines. The majority of larger engines driving contractor equipment are Detroit Diesel 2-stroke engines ranging in size from 6V92 (152 hp) to 16V149 (1600 hp). Smaller engines, less than 100 hp, are Detroit Diesels or Big Blues. Contractor equipment RHC & NO_x emissions are estimated to be 1.3 and 24.9 tons/year average or 0.1 percent and 2.7 percent of platform equipment emissions, respectively.

TABLE 3.1
CONTRACTOR EQUIPMENT

Equipment Type	Platform (s)	Size (hp)	Manufacturer	Number
Barnacle remover	Grace	8	Lombardini 1 cyl	1
Casing Tong	Ellen, Eureka	600	NA	1
Cementing Unit	Habitat	180	DD 353	1
Cementing Unit	Hondo	319	DD AB 71	3
Cementing Unit	Gilda, Habitat	340	DD 8V71	3
Cementing Unit	Harvest	350	GMC 871	2
Cementing Unit	Ellen	NA	DD 8V92	2
Draw Works	Habitat	456	DD 12V71	2
Drilling rig generator	Hermosa	600	NA	1
Drilling rig generator	Harvest	1,120	EMD 8-645	2
Drilling rig generator	Hondo	1,550	DD 16V-149-TL	1
Haliburton Acidizing	Grace	150	DD	1
Haliburton Pumps	Grace	40	DD	3
Haliburton Unit	Eureka	334	NA	1
Haliburton Unit	Ellen	600	NA	2
Log Wire Unit	Ellen, Eureka	600	NA	1
Logging Unit	Harvest	145	Cum v378	1
Logging Unit	Gail	168	Cum V-504-C	1
Mud Pump	Houchin	273	DD 8V71	1
Mud Pump	Hogan	400	Cat 3408	1
Mud Pump	Habitat	725	DD 16V71T	1
OSCA Filters SYS	Habitat	465	DD 12V71	1
Otis Nitro	Habitat	152	DD 6V92	1
Power Tongs	Harvest	55	Cum	1
Power Tongs	Habitat	375	NA	1
Pulling Unit	Hogan, Houchin	273	DD 8V71	1
Rotary Table	Hogan, Houchin	450	DD 6V92T	1
Sand Blasters	Habitat	600	NA	1
Standby gen	Habitiat	375	Cat 3406	1
Standby gen	Habitat	1,600	DD 16V149	1
Temp air compressor	Harvest	475	DD 12V71N	2
Temp air compressor	Harvest	113	DD 371N	1
Welding Gen	Habitat	378	Cat 3406	1
Welding Unit	Habitat	42	Big Blue 400D	6
Wire Line Unit	Grace	40	Deutz Diesel 3 cyl	1
Wire Line Unit	Habitat	102	Ford Diesel	2
Wire Line Unit	Gail	353	DD	1
Wire Line Unit	Habitat	40, 90, 120	DD	3
Total				58

4.0 Methodology Development

This section addresses the RACT rules currently in effect or proposed in the onshore environment, their potential for emissions reductions if applied in the California OCS and a proposed methodology that could be used in Phase II of this project to estimate the cost effectiveness of various control technologies.

4.1 Onshore RACT Precedent

The 1990 Federal Clean Air Act Amendment title VIII states that OCS sources in the affected areas shall be subject to the same requirements "as would be applicable if the source were located in the corresponding onshore area" and shall be subject to "state and local requirements for emission controls, emission limitations, offsets, permitting, monitoring, testing and reporting." (See Appendix E) Therefore, as a part of this study, the RACT rules that exist or are recommended in the adjacent onshore areas were examined.

Four land areas, San Luis Obispo County, Santa Barbara County, Ventura County and the South Coast Air Basin, which immediately border the OCS development areas were examined. Also examined were the Air Quality Management Programs (AQMPs) or Air Quality Attainment Plans (AQAPs) for three of these air basins to determine what possible future rules may be proposed which would affect OCS oil and gas development (San Luis Obispo does not currently have an AQMP). All rules or proposals were grouped into one of three areas; existing rules, rules proposed or recommended by the AQMPs and AQAPs, and areas recommended for further study. These grouping are shown in Table 4.1.

Below is a summary of the currently existing rules and proposed/recommended rules governing reciprocating engines, process heaters, turbines, fugitive and vent emissions and fuels. These categories are the most frequently found equipment on OCS facilities.

TABLE 4.1
ONSHORE RACT RULES AND CONSIDERATIONS
EXISTING RULES

COUNTY	NUMBER	DESCRIPTION	APPLICABILITY/TECHNOLOGY	POLLUTANT	EMISSION LEVELS/ REDUCTION OR CONCENTRATION	SOURCE
Santa Bar	Rule 331	Leaking from valves/flanges	Valves & Flanges	ROC	minimum leak requirements	Santa Barbara
Santa Bar	Rule 332	Refinerys venting	Vent to flares or other only	ROC	98% ROC reduction	Rulebook
Santa Bar	Rule 311	Fuel sulfur content	gaseous	SO2	< 15 grains/100 ft3	
			Liquid/solid		< 0 5 wt%	
Ventura	Rule 59	Electric power generating equip.	> 25 mmBtu/hr	NOx	250 ppm NOx	VEN RULEBOOK
		gaseous fuels	> 2150 mmBtu/hr		125 ppm NOx	
		solid or liquid fuel	> 2150 mmBtu/hr		225 ppm NOx	
Ventura	Rule 64	Fuel sulfur content	gaseous	SO2	< 15 grains/100 ft3	VEN RULEBOOK
			Liquid/solid		< 0 5 wt%	
Ventura	Rule 71.2	ROC storage tank requirements	vapor loss control devices	ROC		VEN RULEBOOK
Ventura	Rule 74.7	Fugitive ROC emissions for	valves/flanges/pumps/comp	ROC	10,000 ppm maximum	VEN RULEBOOK
		Refinerys and Chemical plants	relief valves		< 200 ppm	
Ventura	Rule 74.8	Vaccum producing systems	no venting to atm. Use flare, etc	ROC	98%	VEN RULEBOOK
		process turnarounds				
Ventura	Rule 74.9	Stationary IC engines	Rich burn	NOx, CO	50 ppm, 0.805 g/hp-hr, 90% red NOx	VEN RULEBOOK
		NG or LPG		ROC	4500 ppm CO, 250 ppm ROC @ 15%	
			Lean burn		125 ppm, 2.42 g/hp-hr, 80% red NOx	
					4500 ppm CO, 750 ppm ROC @ 15%	
Ventura	Rule 74.10	Fugitive ROC @ Crude oil, NG	Hatches, open-end lines, flanges	ROC	no leaks allowed > 10,000 PPM	VEN RULEBOOK
		processing facilities	valves		5 per 250 or 2%	
			Other		2 per 200 or 1%	
Ventura	Rule 74.15	Boilers, steam generators &	> 5 mmBtu/hr	NOx	40 ppm NOx, 400 ppm CO	VEN RULEBOOK
		process heaters				
SCAQMD	Rule 431	Fuel sulfur content	gaseous fuel	SO2	< 80 ppm	SCAQMD RULEBOOK
			Diesel fuel		< 0 05 wt%	
			Other liquid fuel		< 0 5 wt%	
			Liquid @ refinery, steam gen or Elec		< 0 25 wt%	
			power generating facility			
			After May4, 1993 - Gas		< 40 ppm	
			After Oct 1, 1993 - All liquid		< 0 05 wt%	
SCAQMD	Rule 466	Pumps/Compressor fugitives	Gas - < 10,000 ppm, seals in good	ROC		SCAQMD RULEBOOK
			order, minimal leakage			
		Valves/Flanges	Regular inspection < 75,000 ppm			
SCAQMD	Rule 467	Pressure Relief valves	Vent to Vapor recovery or inspected	ROC		SCAQMD RULEBOOK
			& maintained according to rule			

TABLE 4.1
ONSHORE RACT RULES AND CONSIDERATIONS
EXISTING RULES

COUNTY	NUMBER	DESCRIPTION	APPLICABILITY/TECHNOLOGY	POLLUTANT	EMISSION LEVELS/ REDUCTION OR CONCENTRATION	SOURCE
SCAQMD	Rule 474	Fuel Burning Equipment	555 - 1786 mmBtu/hr	NOx	300 ppm gas, 400 ppm solid/liquid	SCAQMD RULEBOOK
		NOx nonmobile	1786 - 2143 mmBtu/hr		225 ppm gas, 325 ppm solid/liquid	
			> 2143 mmBtu/hr or > 555 mmBtu/hr		125 ppm gas, 225 ppm solid/liquid	
			steam generating equipment			
SCAQMD	Rule 475	Electric power generating equipment	new equipment > 10 MW	NOx	11 lbs/hr NOx	SCAQMD RULEBOOK
			existing equipment > 5 MW		11 lbs/hr NOx	
SCAQMD	Rule 1107	Coating of metal parts		VOC	Use proper equipment & VOC limits on materials	SCAQMD RULEBOOK
SCAQMD	Rule 1109	Boilers, Process heaters in	gaseous fuel	NOx	0.14 lb NOx/mmBtu	SCAQMD RULEBOOK
		Petroleum refinerys, NOx	Liquid fuel		0.308 lbs NOx/mmBtu	
			After 1992		0.03 lb NOx/mmBtu	
SCAQMD	Rule 1110.1	IC stationary spark ignited engines	> 50 hp rich burn NOx and CO	NOx, CO	90% initial NOx reduction, 80% thereafter or 90 ppm, CO < 2000 ppm @ 15% O2	SCAQMD RULEBOOK
			> 50 hp lean burn, NOx	NOx	80% initial NOx reduction, 70% thereafter or 150 ppm or 2.0 g/hp-hr	
SCAQMD	Rule 1110.2	All Internal Combustion Engines	Stationary > 50 bhp, Portable > 100 bhp	NOx, ROG, CO	NOx < 36 ppm , ROG < 250 ppm, CO < 2000 ppm	SCAQMD Rulebook
			Diesel included		(NOx and ROG have engine efficiency correction factors)	
					or, electrification	
SCAQMD	Rule 1134	Stationary Gas Turbines (liquid or gaseous fueled)	> 400 hp (300 kW)	NOx	3 to 2.9 MW < 25 ppm, > 2.9 MW 9 - 15 ppm	SCAQMD RULEBOOK
		Applicable 1995			9 - 15 ppm range depends on use of SCR and combined cycle	
SCAQMD	Rule 1135	Electric power generating	by 1995	NOx	0.59 lb NOx/MW-hr	SCAQMD RULEBOOK
		steam boilers				
SCAQMD	Rule 1146	Boilers, steam gen, process heaters	> 5 mmBtu/hr & 9 e9 btu/yr	NOx	40 ppm NOx	
			> 40 mmBtu/hr		30 ppm NOx	
SCAQMD	Rule 1401	Carcingenic Emissions	Any process: Use T-BACT	Carinogens	< 1x10e-6 cancer risk	SCAQMD RULEBOOK
SLO	Rule 403	Particulate emissions	Any process	PM	0.3 grains/ft3 dry	SLO Rulebook
SLO	Rule 404	Sulfur emissions	Any Process	S	0.2 vol% as SO2	SLO Rulebook
			Fuels	S	gas - 50 grains/100 ft3	
					liquid & solid - 0.5 wt%	
SLO	Rule 405	NOx emissions from fuel burning	> 1,775 million Btu/hr	NOx	gas - 225 ppm @ 3% oxygen	SLO Rulebook
		equipment			Liquid & solid - 300 ppm @ 3% oxygen	
SLO	Rule 406	CO emissions	IC engines excluded	CO	2000 ppm dry	SLO Rulebook
SLO	Rule 422	Refinery Process turnarounds	Vent to flare or VRS	HC		SLO Rulebook

TABLE 4.1 (continued)
ONSHORE RACT RULES AND CONSIDERATIONS
PROPOSED/RECOMMENDED RULES

COUNTY	NUMBER	DESCRIPTION/APPLICATION	SUGGESTED TECHNOLOGY & APPLICABILITY	POLLUTANT	EMISSION LEVELS/ REDUCTION OR CONCENTRATION	Cost EFFECTIVENESS $/tons of pollutant	PROPOSED ADOPTION DATE	SOURCE
SB	N-5, N-6	Boilers < 10 mmBtu/hr	Radiant burners	NOx	75% NOx reduction	2,000 - 10,000	1990	AQAP
			SCR		20 ppm @ 3% O2			
SB	N-7	All process heaters	Low excess air	NOx	80% NOx reduction	1,200 - 5,200	1992	AQAP
			Staged combustion					
			Radient burners					
			SCR			12,000 - 26,000		
SB	N-8	NG IC engines: Rich burn	NSCR	NOx, CO	90% NOx, 50 ppm @ 15% O2	500 - 1,500	1990	AQAP
			PSC	ROC	5000 PPM CO, 250 PPM ROC			
		NG IC engines: Lean burn	Combustion Mod		80% NOx, 115 ppm @ 15% O2	1,500 - 10,000		
			SCR		5000 PPM CO, 250 PPM ROC			
		All NG IC Engines	Electification	ALL	100%	5,000		
SB	N-9	Onshore gas turbines	Water injection	NOx	70% NOx	1,000 - 5,000	1991	AQAP
			SCR		80% NOx, 10 ppm recommended	6,000		
SB	N-10, R-16	Diesel IC engines	New engines to electrify	NOx	100%	5,000	1991	AQAP
			Existing engines use SCR		80% NOx reduction	5,000 - 10,000		
SB	N-11	Fuel burning platform equipment	New - electrify	NOx	100%		1990	AQAP
			Existing - Diesel injection					
			retard & Air/fuel change		20 - 60%	500 - 1,000		
SB	N-12	Crew and supply boats	4 deg retard, enhanced	NOx			1990	AQAP
			intercool & turbo		25 - 40% reduction	300 - 700		
			New engines		50%	3,500		
			Rebuild to highway specs		30%	1,500 - 5,000		
SB	N-13	Exploratory drilling vessels	4 deg retard, enhanced	NOx			1991	AQAP
			intercool & turbo		25 - 40% reduction	300 - 700		
			New engines		50%	3,500		
			Rebuild to highway specs		30%	1,500 - 5,000		
SB	R-11	Leaking from valves/flanges and	Increased inspection	ROC	minimum leak requirements		1990	AQAP
		PRV, pumps & compressors						
VEN	N-9	Gas turbines	Water injection	NOx	30% reduction			
			SCR		85%	9,600	1992	AQAP
VEN	R-51	Oil field maintenance	Roofs on tanks, good maintenance	ROC	90%	1,000	1991	AQAP
VEN	N-21	Oil well drilling	Electric drill rig	NOx	100%		1990	AQAP
			SCR		80%	2,000 - 6,000		
			Low NOx engine		50%			
VEN	N-27	Boilers, steam generators &	Low NOx burners	NOx	< 50 mmBtu/hr - 70 ppm gas	1,000 - 8,000	1989	AQAP
		process heaters	Flue gas recirculation		> 50 mmBtu/hr - 40 ppm gas			
			SCR			6,000 - 30,000		
SCAQMD	A-8a	Emissions from Architectural coatings	Low VOC coatings	VOC	300 - 400 g/l VOC content			AQAP
SCAQMD	A-11	Clean-up solvents	Low VOC solvents					AQAP
SCAQMD	A-12	Metal Cleaning/Degreasing	Operating/Equip Requirements,	VOC	50%	200 - 25,000		AQAP
			Minimize ventilation, see rule 1122					
SCAQMD	B-6	Crude oil pipeline heaters	Oxygen trim, low NOx heaters, FGR	NOx	50%	2,000 - 22,000		AQAP
			SCR, SNCR, alt fuels					
SCAQMD	B-4	Gasoline fueling of boats	Vapor recovery equipment	VOC	90%	1,200		AQAP

TABLE 4.1 (continued)
ONSHORE RACT RULES AND CONSIDERATIONS
PROPOSED/RECOMMENDED RULES

COUNTY	NUMBER	DESCRIPTION/APPLICATION	SUGGESTED TECHNOLOGY & APPLICABILITY	POLLUTANT	EMISSION LEVELS/ REDUCTION OR CONCENTRATION	Cost EFFECTIVENESS $/tons of pollutant	PROPOSED ADOPTION DATE	SOURCE
SCAQMD	B-9	Petroleum refinery process heaters	Electrostatic precip/Baghouse filters	PM	80%	12,000		AQAP
SCAQMD	B-11	OCS Operations	Engine mods, Alt fuels, I&M, Electrify	ALL	80-95%	15,000 - 25,000		AQAP
SCAQMD	B-13	Oil and gas production, NG	I&M programs	VOC	70%			AQAP
		processing plants, refinerys,	see rule 466 and 467					
		chemical plants, fugitive sources						
SCAQMD	C-2	Non-Utility IC Engines	Electrification	ALL	100%	6,700 - 14,000		AQAP
SCAQMD	C-7	Small boilers and process heaters	Radiant burners, alt fuels, other	NOx	75%	8,000 - 24,000		AQAP
SCAQMD	C-9	Stationary gas turbines	Steam injection, SCR, alt fuels	NOx	60%	3500 for steam inj		AQAP
		see rule 1134						
SCAQMD	F-2	Gaseous fuels sulfur content	Amine treatment, Merox process,	SOx	< 100 ppm sulfur	13,000 - 49,000		AQAP
			Chloride precipitation					
SCAQMD	F-3	Stationary liquid fuels sulfur limit	Hydrodesulfuration, blending	SOx	0.05 wt% for all distillate fuels	25,000		AQAP
		extension of rule 431			0.10 wt% for residuel fuels			
					in power plants			
					0.25 wt% residual fuels			
					in industrial boiler/heaters			
SCAQMD	F-1	All permitted stationary sources	Installation of BARCT technology	ALL	20%	5,300 - 24,500		AQAP
SCAQMD	F-5	Stationary ammonia sources	Require permits and fees	NH3				AQAP
SCAQMD	F-10	Stationary sources fuel oil/solid	phase out use of these fuels	NOx	60%	18,900 - 65,700		AQAP
		fossil fuel		PM	85%			
				SOx	100%			
SCAQMD	I-3	Emissions from marine vessel tanks	Vapor recovery for loading/offloading,	ROC	30 - 95%	400 - 4,000		AQAP
			controlled operations for ballasting					
SCAQMD	I-4	Marine diesel operations	Reduce cruising speed, no by-passing	NOx	20%	5,400		AQAP
			ships					
SCAQMD	I-5	Maine vessels SOx emissions	Lower fuel sulfur, electrify berthing	SOx	60 - 100%	3,000		AQAP
			operations, scrubbers					

All SCAQMD proposed/recommended rules taken from the SC Air Quality Management Plan, 1989 Revision final, Appendix IV-A

All Santa Barbara (SB) County proposed/recommended control measures taken from 1989 AQAP, appendix C

All Ventura County measures taken from Ventura County AQMP, appendix H-87, July 1988

TABLE 4.1 (continued)

ONSHORE RACT RULES AND CONSIDERATIONS

RULES SUGGESTED FOR FURTHER STUDY

COUNTY	NUMBER	DESCRIPTION/APPLICATION	SUGGESTED TECHNOLOGY & APPLICABILITY	POLLUTANT	EMISSION LEVELS/ REDUCTION OR CONCENTRATION	COST EFFECTIVENESS $/tons of pollutant	SOURCE
SB	R-26, N-16	Construction equipment	Maintain/tune equipment	NOx			AQAP
			Electrify, catalysts, 4 deg retard				
SB	R-32	No venting to atm for NG	Vent to flares or other only	ROC	98% ROC reduction		AQAP
		processing and other facilities					
SB	N-19	Crew & Supply boats alt fuels	Use alternative fuels	NOx			AQAP
SB	N-21	Flare NOx reduction	Electric ignition	NOx			AQAP
			Pipeline quality gas pilot				
SB	N-22	Offroad construction diesel	4 deg retard	NOx	20 - 50%	1,000 - 5,000	AQAP
			EGR				
VEN	N-2	Enhanced oil recovery steam gen	Ceramic burner	NOx	60 - 90%, new - < 15 ppm	2,000	AQAP
			SCR		existing - < 30 ppm	4,000 - 16,000	
VEN	N-22	IC engine electrification	When replaced, use electric motors	ALL	100%		AQAP
VEN	N-23	External combustion NOx control	Ceramic burners	NOx	60 - 90%, new - 15 ppm		AQAP
			SCR		existing - 15 to 30 ppm		
SCAQMD	T-1	Gasoline & Diesel	Emission charges	All			AQAP
SCAQMD	B-12	Petroleum refinery flares	Monitoring initially				AQAP
SCAQMD	A-20	Solvent Waste	Prohibit improper disposal	VOC			AQAP
			Waste Minimization				

Reciprocating Engines

South Coat Rule 1110.2 requires that all existing internal combustion (IC) engines either spark or compression ignited, be either electrified or reduce NO_x emissions to 36 ppm, CO emissions to 2000 ppm and ROG emissions to 250 ppm, adjusted to 15 percent oxygen. Adjustments area allowed for engine efficiency. (See Appendix E).

Ventura County and the South Coast Air Basin currently have rules regulating NO_x, CO and ROC emissions from reciprocating natural gas fueled IC engines. These essentially require the installation catalysts or combustion modifications to produce emission reductions from 70 - 90 percent. Santa Barbara County is currently developing a rule similar to the IC engine rules in Ventura County and the South Coast Air Basin.

Santa Barbara and Ventura Counties have recommended electrification for stationary natural gas fueled engines only. Santa Barbara AQAP recommendation #N-11, would require injection timing retard on all diesel platform equipment.

Process Heaters

Ventura County and the South Coast Air Basin have rules governing the NO_x emissions from process heaters rated at greater than 5 million Btu/hr. These rules limit the emissions to less than 40 ppm NO_x and 400 ppm CO. South Coast currently has a limit of 0.14 lbs NO_x/MMBtu but the limit will drop to 0.03 lbs NO_x/MMBtu in 1992.

All three areas recommend rules that would require NO_x emissions from process heaters to be reduced by 80 percent.

Turbines

South Coast Rule 1134 requires all existing stationary gas turbines (gas or liquid fueled) greater than 400 hp to reduce NO_x emissions to 9-25 ppm depending on size and control technology (see Appendix E). A correction for efficiency is included.

Rules are recommended in all three districts which would require NO_x controls such as water/steam injection and/or SCR. NO_x reduction of 30 - 85 percent could be realized with these two techniques. These rules have been recommended for the near term with proposed adoption dates of 1991 - 1992.

Vents and Fugitive Emissions

All onshore districts currently have rules governing fugitive emissions from valves, flanges, open ended lines, pump seals, compressor seals and relief valves. Generally, the rules, such as Santa Barbara Rule #331 and 332, Ventura Rule #74.7 and South Coast Rule #466 (see Table 4.1) specify a maximum level of detectable hydrocarbons at the component site of 10,000 ppm above background or a certain allowed number of leaking components or a required inspection program. Rules also state that vents should relieve to vapor recovery systems or flares. All refineries onshore are required to have flares; no venting of hydrocarbons directly to the atmosphere is allowed.

Recommended rules for fugitive emissions propose more frequent inspection periods, vapor recovery on fueling procedures and I&M programs.

Fuels

All areas currently have rules governing fuel sulfur content for gaseous and liquid fuels. These specify the sulfur content to be less than 15 grains/100 ft^3 or 80 ppm for gaseous fuels and less than 0.5 weight percent for liquid and solid fuels. Recommended rules include tighter limits on sulfur content, such as 0.05 - 0.25 weight percent for liquid fuels depending on the process, and phase out of the use of fuel oils and solid fuels.

Other

Another area of increasing concern is toxic emissions. South Coast Rule #1401 specifies maximum individual cancer risk levels for emissions of carcinogenic compounds for all new and modified sources. Vents and flares, depending on the platform gas, could be emitters of carcinogenic compounds.

4.2 Effect of Onshore RACT Rules on the OCS

The existing rules in the California onshore environment would have a significant effect on OCS equipment. Diesel engines, turbines and vents would all require substantial levels of control. Table 4.2 shows the emissions for the OCS platform equipment at an uncontrolled level, the current level and with onshore existing rules. Some diesel engines, turbines and vessels are currently equipped with emission control technologies. This table assumes that the most stringent onshore RACT rule is applied to the entire OCS. While all the onshore areas have rules against venting, only the South Coast has RACT rules which apply to turbines and diesel engines.

TABLE 4.2
EMISSION REDUCTION ASSOCIATED WITH ONSHORE RULES APPLIED TO PLATFORM EQUIPMENT

NOx EMISSIONS

Equipment	Uncontrolled	Current Level	With Onshore Existing Rules Applied	Existing Rules Control Description
Diesel Engines	136.68	131.11	13.67	SCR & 4 deg Timing Retard with Enhanced Intercooling (90% reduction)
Turbines/Compressors	759.88	643.99	75.99	Water Injection & SCR (90% reduction)
Flares	12.23	12.23	16.20	Flares for THC produce NOx
Other Natural Gas	2.09	2.09	2.09	SCR (80% reduction)
Contractor Equipment	24.90	24.90	14.94	4 deg Timing Retard with Enhanced Intercooling (40% reduction)
Vessels	503.17	348.18	301.90	4 deg Timing Retard with Enhanced Intercooling (40% reduction)
TOTAL	1,438.95	1,162.49	424.79	
Percent Reduction	0.0	19.2	70.5	

THC EMISSIONS

Equipment	Uncontrolled	Current Level	With Onshore Existing Rules Applied	Existing Rules Control Description
Diesel Engines	7.34	7.32	7.32	4 deg Timing Retard with Enhanced Intercooling for NOx control
Turbines/Compressors	72.34	93.50	108.51	Water Injection & SCR for NOx control (50% THC increase)
Flares	0.84	0.84	0.84	None
Other Natural Gas	0.16	0.16	0.16	SCR for NOx control
Contractor Equipment	1.33	1.33	1.33	4 deg Timing Retard with Enhanced Intercooling for NOx control
Vents	1,557.40	1,557.40	31.15	Flares (99.98% reduction)
Vessels	26.93	26.93	26.93	4 deg Timing Retard with Enhanced Intercooling for NOx control
TOTAL	1,666.34	1,687.48	176.24	
Percent Reduction	0.0	-1.3	89.4	

NOTES: *Existing rules are assumed to be the most stringent of the onshore areas. Ex: Only LA has RACT rules for turbines, but this rule was applied to Platforms offshore Ventura County too.*

Equipment currently with controls includes Gail turbines; Habitat gas compressor engine; Harvest standby generators and turbines;; Hermosa and Hidalgo cranes, standby generators and turbines.

- *All contractor equipment is powered by diesel engines.*
- *Application of water injection to turbines can increase THC emissions. A 50% increase was assumed.*

With the application of flares to vents; water injection and SCR (or some other technology that can achieve similar NO_x reductions) to all turbines; and timing retard, enhanced intercooling and possibly SCR to diesel engines, NO_x and THC emissions from the platforms and vessels would be reduced by 70.5 percent and 89.4 percent, respectfully (see Table 4.2).

It is important to note, that the technologies used onshore are not necessarily transferrable to the offshore environment and may be significantly more expensive and not technically feasible. SCR, for example, has never been demonstrated in the offshore environment. Phase II of this project will address the technical feasibility and the costs of different emission control technologies in the OCS.

4.3 Phase II Evaluation Methodology

The determination of RACT requirements for California offshore platforms requires the consideration of a variety of factors. Offshore operations are quite different from their onshore counterparts. Accordingly, offshore air pollution control technologies have their own set of costs and operabilities. Since most published data on air pollution control efforts only cover onshore sources, it will be necessary to extrapolate the information for onshore technologies for their potential offshore applications.

Offshore facilities have a finite useful life, which is dictated by the rate of production, the value of the oil produced, and the cost of operating the platform. The remaining life of some California OCS facilities might be less than the normal expected life of a retrofit air pollution control strategy. This fact can affect the real cost effectiveness of a particular control strategy.

The evaluation methodology which is described in this section has been developed to account for the most important factors impacting an individual control strategy's cost and effectiveness. The methodology is designed to account for the site-specific conditions of the 21 present day California OCS facilities. The methodology is somewhat more rigorous than the analysis that is often presented in support of onshore RACT determinations. This rigor is justified by the small number of facilities (21) and the large differences in capacities, age, configuration, and equipment among these different facilities.

4.3.1 Technical and Financial Analysis Methodology

Candidate RACT measures will be evaluated for the most significant emission sources with a site specific methodology. Other emission sources are to be evaluated using a method which defines typical platform equipment. In both cases, however, the financial analysis portion of the RACT evaluation will follow the same procedure. Only the technical analysis, which determines the equipment requirements and cost, will be different.

The evaluation of RACT measures will consist of the following six elements:

- Engineering Evaluation
- Capital Cost Estimation
- Operating Cost Estimation
- Net Present Value (NPV) Analysis
- Lifetime Emissions Estimation
- Cost Effectiveness Determination

Each of these are further described below. Specific sources of information to be used in carrying out this analysis are described in Section 4.6

Engineering Evaluation

The engineering evaluation will develop a design basis suitable for preparing estimates of the capital and operating costs. In general, these evaluations will develop information of a comparable nature to that used in evaluating emission control strategies for onshore facilities. In addition, the engineering evaluation will also consider any special features for offshore installation. Such unique features might include equipment relocation, onshore shakedown, special installation procedures, or any other item which distinguishes the offshore installation from a conventional onshore installation.

Capital Cost Estimation

The capital costs will be developed in two parts: the first will develop the cost for a comparable onshore equipment installation, broken down into basic equipment cost and installation costs; the second will involve adjusting the equivalent onshore cost to be consistent with the offshore installation requirements.

Various methods can be used in developing the capital cost estimates. Vendor quotations or published cost curves are appropriate for estimating capital costs of those technologies

analyzed on a site specific basis. This level of detail, however, might not be warranted for the other technologies. Their cost estimates will likely be developed through engineering scaling relationships of published cost estimates.

Operating Cost Estimation

The components of the operating costs will include raw materials, energy, maintenance and labor. Some of these will be developed in the engineering evaluation. The costs for common operating cost elements will be developed and applied to all evaluations (see Section 4.6). Other operating cost elements will be developed from published sources or through vendor quotations. Most operating costs will be regular annual costs. Others, such as catalyst replacement, might occur only every several years. The period of applicability of all operating costs elements, if not one year, will be noted.

Net Present Value Analysis

The NPV analysis will combine the initial capital costs with the recurring operating costs to form a present year total cost. This evaluation will follow the standard procedure of discounting future year expenditures by an appropriate discount rate. The npv analysis will be taken over the life of the air pollution control equipment or the remaining life of the offshore platform, whichever is less.

An annotated NPV analysis showing the use of 4° injection timing retard is given in Table 4.3. The sources for the data used in this figure are described in Section 4.6. The fundamentals of NPV analyses are described in many texts and references, so they are not described here.

Lifetime Emissions Reductions

The lifetime emissions reduction for each candidate control strategy will be evaluated over the same period of time as the npv analysis. In this manner, the cost effectiveness can be calculated consistently. The emissions reductions will be estimated using the baseline emissions from the inventory and the control technology effectiveness as determined thorough the engineering analysis. If necessary, the emissions will be adjusted in accordance with the multi-pollutant emission reduction strategy (see Section 4.7).

TABLE 4.3
EXAMPLE NET PRESENT VALUE CALCUALTION
INJECTION TIMING RETARD FOR A TURBOCHARGED DIESEL ENGINE

Calculation Inputs

Basis	
Engine Size, hp	300
Annual use, hours	800
Average load factor, %	50
Annual fuel consumption, gal	6900
Emission factor, g/hp-hr	10
Emissions	
Baseline, tons/year	1.32
Emission reduction, %	20
Cost Estimate	
Initial cost	$1,000
Annual O & M	$500
Annual Source testing	$1,000
Fuel Penalty, %	4
Fuel price, $/gallon	$0.60
Financial Assumptions	
Life of facility/control technology, yrs	5
Nominal inflation rate	5%
Nominal discount rate	10%

Calculation

	Year					
	1	2	3	4	5	**total**
Initial cost	$1,000					
Annual O & M	$500	$500	$500	$500	$500	
Source testing	$1,000	$1,000	$1,000	$1,000	$1,000	
Fuel Penalty	$166	$166	$166	$166	$166	
Total	$2,666	$1,666	$1,666	$1,666	$1,666	
Inflation factor	1.0000	1.0500	1.1025	1.1576	1.2155	
Inflated Total	$2,666	$1,749	$1,836	$1,928	$2,025	
Discount Factor	1.0000	1.1000	1.2100	1.3310	1.4641	
Discounted total	$2,666	$1,590	$1,518	$1,449	$1,383	$8,605
Emission reduction, t/yr	0.264	0.264	0.264	0.264	0.264	1.32

Cost Effectiveness, $/ton **$6,519**

Cost Effectiveness Determination

The final step in the evaluation is the determination of cost effectiveness. This number will represent the cost of control per unit mass of pollutant (i.e, $ per ton). Both the cost and the emission reduction will be expressed in terms of their present value over their expected life. The mass of pollutant reduction will be adjusted in accordance with the multi-pollutant methodology. This unit cost can be used both for rank-ordering various RACT options for OCS facilities, and for comparing the cost of offshore RACT to onshore air pollution control requirements.

4.3.2 Safety

The use of emission control technologies can produce certain safety issues which must be addressed. The new Clean Air Act authorizes the States to regulate the OCS environment for air emissions, but the MMS still has the authority and the obligation to protect the safety of the workers in the OCS. Some emission control technologies require the use of hazardous materials. Requirements for the use of these emission control technologies which will minimize the safety concerns will be recommended.

For example, selective catalytic reduction (SCR) reduces NO_x emissions by injecting ammonia into the exhaust stream. The ammonia then reacts with the NO_x to produce nitrogen and water. In order to use SCR, therefore, ammonia would have to be stored on the platforms. Ammonia is considered a hazardous substance if it is in anhydrous form. Anhydrous form is how ammonia is used in the existing onshore SCR systems. But SCR can also use aqueous ammonia, which does not present nearly the same safety concern, but does require additional storage volume. These types of issues will be addressed for each emission control technology evaluated in Phase II of this project.

4.3.3 Contractor Equipment

Contractor equipment was found to be present on 10 of the 21 platforms surveyed. All of the contractor equipment is diesel engine powered by about 20 different diesel engine types. Because of this diverse range of engine models and manufacturers and the relatively small percentage of emissions (<3 percent), Phase II will assume that each contractor equipment type is powered by the same engine model and manufacturer. This will reduce the amount of resources required to examine the feasibilities associated with the different emission control technologies.

4.3.4 Data Sources for the RACT Evaluation

The cost evaluation described in Section 4.4 will require a consistent set of cost and financial assumptions to be used in evaluating all of the candidate RACT measures. This set of information will include unit costs to develop the operating costs and financial parameters for the NPV analysis.

The most important financial and cost parameters, along with their present day values and their references are shown in Table 4.4. Appropriate values for these unit costs and financial parameters will probably change between the time this report is issued and when the evaluations are actually performed. The values shown in this figure, therefore, represent values which would be used in conducting the analysis today. The references shown should be consulted so that the values for each item can be updated with the appropriate value.

TABLE 4.4

NPV ANALYSIS COMMON ASSUMPTIONS AND PARAMETERS

Operating and Maintenance Unit Cost Parameters

Cost Item	Approximate Value	Units	Basis
Platform Fuel Gas	$2.50	$/10^{3}ft^3	NGPA Section 109 less royalty.
Utility Power	$0.05	$/kWh	Lower of actual published rate schedule for uninterruptable industrial power or rate commitment by serving utilities.
Diesel Fuel	$0.60	$/gal	West Coast price as published in Oil Buyers Guide delivered to platform.

Financial Analysis Parameters

Parameter	Values as of May 1990	Basis
Long-Term Inflation	4-5%	The DOC published forecast for CPIU (Consumers Price Index, Urban).
Discount Rate	10%	As required by SEC for valuation of reserves, (code of Federal Regulations; 17 CFR Chapter 11, Section 210.4-10, Paragraph (k)(6)(ii)).
Project Financing Technique	NA	Assumed to be 100% operator's equity.

Appendix A
Platform Database Printout

Platform : EDITH

GENERAL FACILITY DESCRIPTION

Operator : Unocal
Offshore of : Los Angeles County
Treating Facility: Huntington

Tract Number : 296
Field/Area : Beta Unit

Drilling Start Year : 1983
Drilling Time (yrs) : 2
Yr of Decommissioning: 2010

Peak Production Year : 1984
Peak Production (bbl/day): 4100

Power cable (Yes/No) : Yes

	1986	1987	1988	1989	Projected 1990	
Wells*	17	17	17	17	17	
Gas Production	474.5	319.0	209.0	274.0	303.0	10^6 scf
Oil Production	730.0	469.0	350.0	565.0	527.0	10^3 bbl

* Cumulative number of wells capable of producing.

FUEL DESCRIPTION

Fuel Code	Description	Lower Heating Value	Units	Sulfur Content	Units
D	Diesel	127000.0	Btu/gal	0.0500	wt %
NG	Natural Gas	950.0	Btu/scf	250.00	ppmv

Platform: EDITH (con't)

FUEL CONSUMING EQUIPMENT: Reciprocating and Fired Units

Equipment Description	Size or Capacity	Manufacturer	Model Number	For Engines Only: 2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Controlled (Y/N)	Control Description
Crane #1 (north)	475.0 hp	Detroit Diesel	8V92TAC	2	Yes	Yes	No	
Crane #2 (south)	475.0 hp	Detroit Diesel	8V92TAC	2	Yes	Yes	No	
Emergency Generator	700.0 hp	Caterpillar	D-379	4	No	No		
Firewater Pump	600.0 hp	Caterpillar	3406-PC	4	No	No		
Flare (Low)	14.6 10^6 Btu/hr	Nat.Airoil Burn						
Flare (high)	271.0 10^6 Btu/hr	Nat.Airoil Burn						
Thermal Htr (10-100)	20.0 MMBtu/hr	Smalling, Inc.	custom-built					

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption: Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Crane #1 (north)	D	26.40 gal/hr	1.440	1.440	1.320	10.404	5.000	10^3 gal	1
Crane #2 (south)	D	26.40 gal/hr				10.404	5.000	10^3 gal	1
Emergency Generator	D	40.00 gal/hr	0.240	0.240	0.220	0.820	0.240	10^3 gal	2
Firewater Pump	D	18.60 gal/hr	0.240	0.240	0.220	1.061	0.240	10^3 gal	1
Flare (Low)	NG	scfh						10^6 scf	3
Flare (high)	NG	scfh	4.880	3.534	4.198	7.696	5.000	10^6 scf	3
Thermal Htr (10-100)	NG	1.67 scfh	31.800	33.480	30.690	12.370	20.000	10^3 gal	3

Platform : ELLEN

GENERAL FACILITY DESCRIPTION

Operator : Shell
Offshore of : Los Angeles County
Treating Facility: Platform Elly

Tract Number : 300
Field/Area : Beta Unit

Drilling Start Year : 1980
Drilling Time (yrs) : 7
Yr of Decommissioning: 2010

Peak Production Year : 1987
Peak Production (bbl/day): 0

Power cable (Yes/No) : No

	1986	1987	1988	1989	Projected 1990	
Wells*	32	32	30	30	30	
Gas Production	876.0	677.3	376.2	620.0	620.0	10^6 scf
Oil Production	2701.0	2368.3	1840.5	1814.9	1814.9	10^3 bbl

* Cumulative number of wells capable of producing.

FUEL DESCRIPTION

Fuel Code	Description	Lower Heating Value	Units	Sulfur Content	Units
D	Diesel		Btu/gal	0.0300	wt %
NG	Natural Gas		Btu/scf	800.00	ppmv

Platform: ELLEN (con't)

FUEL CONSUMING EQUIPMENT: Reciprocating and Fired Units

Equipment Description	Size or Capacity	Manufacturer	Model Number	For Engines Only: 2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Controlled (Y/N)	Control Description
Crane #1 (east)	215.0 hp	Detroit Diesel	6-71 IN	2	No	Yes	No	
Crane #2 (center)	215.0 hp	Detroit Diesel	6-71 IN	2	No	Yes	No	
Escape Capsule	32.0 hp	Faryman	S-30	4	No	Yes	No	
Flare (10-100)								
Rig Generator #1	800.0 hp	Caterpillar	D-398	4	Yes	Yes	No	
Rig Generator #2	800.0 hp	Caterpillar	D-398	4	Yes	Yes	No	
Rig Generator #3	800.0 hp	Caterpillar	D-398	4	Yes	Yes	No	
Standby Generator	640.0 hp	Caterpillar	D-379	4	Yes	Yes	No	

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption: Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Crane #1 (east)	D	9.60 gal/hr	10.160	11.057	9.425	4.858	4.900	10^3 gal	1
Crane #2 (center)	D	9.60 gal/hr	10.160	11.057	9.425	4.858	4.900	10^3 gal	1
Escape Capsule	D	2.00 gal/hr	0.010	0.013	0.010	0.025	0.025	10^3 gal	1
Flare (10-100)	NG	scfh	26.350	21.452				10^6 scf	3
Rig Generator #1	D	25.00 gal/hr	33.947	63.968	64.200	14.814	15.316	10^3 gal	2
Rig Generator #2	D	25.00 gal/hr	33.947	63.968	64.200	14.814	15.316	10^3 gal	2
Rig Generator #3	D	25.00 gal/hr	33.947	63.968	64.200	14.814	15.316	10^3 gal	2
Standby Generator	D	12.50 gal/hr	0.460	0.871	0.458	0.120	0.120	10^3 gal	2

Platform: ELLEN (con't)

CONTRACTOR EQUIPMENT

Equipment Description	Owner	Engine Size	Manufacturer	Model Number	2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Control (Y/N)	Initial Date of Service	Final Date of Service
Casing Tong		600 hp								
Cementing Unit #1		hp	Detroit Diesel	8V92	2	No	No	No		
Cementing Unit #2		hp	Detroit Diesel	8V92	2	No	No	No		
Haliburton Unit #1		600 hp								
Haliburton Unit #2		600 hp								
Log/Wireline Unit		600 hp								

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Casing Tong	D	gal/hr						10^3 gal	1
Cementing Unit #1	D	10.00 gal/hr						10^3 gal	1
Cementing Unit #2	D	10.00 gal/hr						10^3 gal	1
Haliburton Unit #1	D	gal/hr	1.033					10^3 gal	1
Haliburton Unit #2	D	gal/hr	1.033					10^3 gal	1
Log/Wireline Unit	D	gal/hr						10^3 gal	1

Platform : ELLY

GENERAL FACILITY DESCRIPTION

Operator : SHELL
Offshore of : Los Angeles County
Treating Facility: Long Beach

Tract Number : 300
Field/Area : Beta Unit

Drilling Start Year : 0
Drilling Time (yrs) : 0
Yr of Decommissioning: 2009

Peak Production Year : 0
Peak Production (bbl/day): 0

Power cable (Yes/No) : No

	1986	1987	1988	1989	Projected 1990	
Wells*	0	0	0	0	0	
Gas Production	0.0	0.0	0.0	0.0	0.0	10^6 scf
Oil Production	0.0	0.0	0.0	0.0	0.0	10^3 bbl

* Cumulative number of wells capable of producing.

FUEL DESCRIPTION

Fuel Code	Description	Lower Heating Value	Units	Sulfur Content	Units
D	Diesel		Btu/gal	0.0020	wt %
NG	Natural Gas		Btu/scf	1089.0	ppmv

Platform: ELLY (con't)

FUEL CONSUMING EQUIPMENT: Reciprocating and Fired Units

Equipment Description	Size or Capacity	Manufacturer	Model Number	For Engines Only: 2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Controlled (Y/N)	Control Description
Crane #1 (east)	215.0 hp	Detroit Diesel	6-71 IN	2	No	Yes	No	
Crane #2 (west)	215.0 hp	Detroit Diesel	6-71 IN	2	No	Yes	No	
Emerg Gen #1	215.0 hp							
Emerg Gen #2 (MARS)	143.0 hp	Detroit Diesel	4-71 IN	2	No	Yes	No	
Escape Capsule	32.0 hp	Faryman Diesel	S-30	4	No	Yes	No	
Flare	33.3 10^6 Btu/hr							
Gas Compressor (K04)	1600.0 hp							
Standby Gen	769.0 hp	Detroit Diesel	16V92	2	No	Yes	No	

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption: Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Crane #1 (east)	D	9.60 gal/hr	2.365	2.811	2.305	1.382	1.500	10^3 gal	1
Crane #2 (west)	D	9.60 gal/hr	2.365	2.811	2.305	1.382	1.500	10^3 gal	1
Emerg Gen #1	D	gal/hr	1.230	1.298	1.300	1.297	1.300	10^3 gal	1
Emerg Gen #2 (MARS)	D	6.10 gal/hr	0.051	0.061	0.060	0.210	0.240	10^3 gal	1
Escape Capsule	D	2.00 gal/hr	0.004	0.005	0.005	0.255	0.250	10^3 gal	1
Flare	NG	12500.00 scfh	19.400	21.600	17.799	17.701	17.700	10^6 scf	3
Gas Compressor (K04)	NG	scfh	27.110	5.297				10^6 scf	6
Standby Gen	D	34.80 gal/hr			0.450	0.260	0.300	10^3 gal	2

Platform: ELLY (con't)

TURBINE EQUIPMENT

Equipment Description	Application	Engine Size	Manufacturer	Model Number	Fuel Consumption, Max Load NG (10^3 scf/hr)	Fuel Consumption, Max Load Diesel (gal/hr)	Water Injection (Y/N)	Water Injection Ratio, Maximum (lb water/lb fuel) NG	Water Injection Ratio, Maximum (lb water/lb fuel) Diesel
Turbine #1 (P07A)	Compressor	1050.0 hp	Solar	Saturn MG1-5B	10.0	120.0	No		
Turbine #2 (P10A)	Compressor	1050.0 hp	Solar	Saturn MG1-5B	10.0	120.0	No		
Turbine #3 (P10B)	Compressor	1050.0 hp	Solar	Saturn MG1-5B	10.0	120.0	No		
Turbine #4 (J01A)	Generator	1140.0 hp	Solar	Centaur	63.0	576.0	No		
Turbine #5 (J01B)	Generator	1140.0 hp	Solar	Centaur	63.0	576.0	No		
Turbine #6 (J01C)	Generator	1140.0 hp	Solar	Centaur	63.0	576.0	No		
Turbine #7 J01D MARS	Generator	10000 hp	Solar	Mars	63.0	576.0	No		
Turbine #8 J01E MARS	Generator	10000 hp	Solar	Mars	63.0	576.0	No		

Fuel Consumption

Fuel Consumption Mode	Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Turbine #1 (P07A)							
NG with water inj.						10^6 scf	
NG w/o water inj.	40.199	45.900	51.575	45.102	50.000	10^6 scf	4
TOTAL NG	40.199	45.900	51.575	45.102	50.000	10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.	6.071	12.186	90.693	58.885	60.000	10^3 gal	5
TOTAL DIESEL	6.071	12.186	90.693	58.885	60.000	10^3 gal	
Turbine #2 (P10A)							
NG with water inj.						10^6 scf	
NG w/o water inj.	41.714	36.578	24.013	55.175	60.000	10^6 scf	4
TOTAL NG	41.714	36.578	24.013	55.175	60.000	10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.	4.616	10.555	38.384	112.047	100.000	10^3 gal	5
TOTAL DIESEL	4.616	10.555	38.384	112.047	100.000	10^3 gal	

Platform: ELLY (con't)

Fuel Consumption

Fuel Consumption Mode	Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Turbine #3 (P108)							
NG with water inj.						10^6 scf	
NG w/o water inj.	46.904	55.170	47.951	32.175	35.000	10^6 scf	4
TOTAL NG	46.904	55.170	47.951	32.175	35.000	10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.	9.809	27.654	87.922	49.388	50.000	10^3 gal	5
TOTAL DIESEL	9.809	27.654	87.922	49.388	50.000	10^3 gal	
Turbine #4 (J01A)							
NG with water inj.						10^6 scf	
NG w/o water inj.	78.101	26.484	16.045	210.674	200.000	10^6 scf	4
TOTAL NG	78.101	26.484	16.045	210.674	200.000	10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.	1.722	34.857	64.119	76.026	75.000	10^3 gal	5
TOTAL DIESEL	1.722	34.857	64.119	76.026	75.000	10^3 gal	
Turbine #5 (J01B)							
NG with water inj.						10^6 scf	
NG w/o water inj.	51.405	21.922	30.137	89.952	80.000	10^6 scf	4
TOTAL NG	51.405	21.922	30.137	89.952	80.000	10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.	2.322	41.713	31.093	86.372	80.000	10^3 gal	5
TOTAL DIESEL	2.322	41.713	31.093	86.372	80.000	10^3 gal	
Turbine #6 (J01C)							
NG with water inj.						10^6 scf	
NG w/o water inj.	92.370	9.660	28.174	29.310	30.000	10^6 scf	4
TOTAL NG	92.370	9.660	28.174	29.310	30.000	10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.	3.666	7.972	37.509	82.910	60.000	10^3 gal	5
TOTAL DIESEL	3.666	7.972	37.509	82.910	60.000	10^3 gal	

Platform: ELLY (con't)

Fuel Consumption Mode	Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Turbine #7 J01D MARS							
NG with water inj.						10^6 scf	
NG w/o water inj.	442.685	432.968	420.555	524.890	525.000	10^6 scf	4
TOTAL NG	442.685	432.968	420.555	524.890	525.000	10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.	16.796	153.650	23.120	17.969	20.000	10^3 gal	5
TOTAL DIESEL	16.796	153.650	23.120	17.969	20.000	10^3 gal	
Turbine #8 J01E MARS							
NG with water inj.						10^6 scf	
NG w/o water inj.	415.233	465.586	496.736	336.773	350.000	10^6 scf	4
TOTAL NG	415.233	465.586	496.736	336.773	350.000	10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.	16.093	129.056	23.078	90.723	95.000	10^3 gal	5
TOTAL DIESEL	16.093	129.056	23.078	90.723	95.000	10^3 gal	

Platform : EUREKA

GENERAL FACILITY DESCRIPTION

Operator : Shell
Offshore of : Los Angeles County
Treating Facility: Elly

Tract Number : 301
Field/Area : Beta Unit

Drilling Start Year : 1984
Drilling Time (yrs) : 3
Yr of Decommissioning: 2014

Peak Production Year : 1987
Peak Production (bbl/day): 0

Power cable (Yes/No) : No

	1986	1987	1988	1989	Projected 1990	
Wells*	20	31	27	28	28	
Gas Production	1095.0	1434.0	696.3	459.3	459.3	10^6 scf
Oil Production	3613.5	3829.4	3832.6	3278.3	3278.3	10^3 bbl

* Cumulative number of wells capable of producing.

FUEL DESCRIPTION

Fuel Code	Description	Lower Heating Value	Units	Sulfur Content	Units
D	Diesel		Btu/gal	0.0300	wt %
NG	Natural Gas		Btu/scf	800.00	ppmv

Platform: EUREKA (con't)

FUEL CONSUMING EQUIPMENT: Reciprocating and Fired Units

Equipment Description	Size or Capacity	Manufacturer	Model Number	For Engines Only: 2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Controlled (Y/N)	Control Description
Crane #1 (East)	215.0 hp	Detroit Diesel	6171	2	No	No	No	
Crane #2 (West)	215.0 hp	Detroit Diesel	6171	2	No	No	No	
Crane #3 (Center)	215.0 hp	Detroit Diesel	6171	2	No	No	No	
Emergency Gen #1	620.0 hp	Caterpillar	D-3412	4	Yes	No	No	
Emergency Gen #2	530.0 hp	Caterpillar	D-379	4	Yes	Yes	No	
Escape Capsule #1	45.0 hp	Perkins	4.108M	4	No	No	No	
Escape Capsule #2	45.0 hp	Perkins	4.108M	4	No	No	No	
Escape Capsule #3	45.0 hp	Perkins	4.108M	4	No	No	No	
Flare (10-100)								
Rig Generator #1	800.0 hp	Caterpillar	D-398	4	Yes	Yes	No	
Rig Generator #2	800.0 hp	Caterpillar	D-398	4	Yes	Yes	No	
Rig Generator #3	800.0 hp	Caterpillar	D-398	4	Yes	Yes	No	
Utility Pump	360.0 hp	Detroit Diesel	8V92	2	No	No	No	

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption: Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Crane #1 (East)	D	9.00 gal/hr	4.083	2.923	1.718	1.488	1.500	10^3 gal	1
Crane #2 (West)	D	9.00 gal/hr	4.083	2.923	1.718	1.488	1.500	10^3 gal	1
Crane #3 (Center)	D	9.00 gal/hr	4.083	2.923	1.718	1.488	1.500	10^3 gal	1
Emergency Gen #1	D	21.00 gal/hr	0.920	9.588	2.835	0.834	0.800	10^3 gal	2
Emergency Gen #2	D	12.50 gal/hr	0.142	0.551	0.176	0.148	0.100	10^3 gal	1
Escape Capsule #1	D	3.00 gal/hr	0.032	0.010	0.013	0.006	0.006	10^3 gal	1
Escape Capsule #2	D	3.00 gal/hr	0.032	0.010	0.013	0.006	0.006	10^3 gal	1
Escape Capsule #3	D	3.00 gal/hr	0.032	0.010	0.013	0.006	0.006	10^3 gal	1
Flare (10-100)	NG	scfh	6.550	6.772	0.715	1.251		10^6 scf	3
Rig Generator #1	D	25.00 gal/hr	84.227	79.865	25.188	2.240		10^3 gal	2
Rig Generator #2	D	25.00 gal/hr	84.227	79.865	25.188	2.240		10^3 gal	2

Platform: EUREKA (con't)

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Rig Generator #3	D	25.00 gal/hr	84.227	79.865	25.188	2.240		10^3 gal	2
Utility Pump	D	9.60 gal/hr	5.450	18.260	5.410	3.650		10^3 gal	1

Platform: EUREKA (con't)

CONTRACTOR EQUIPMENT

Equipment Description	Owner	Engine Size	Manufacturer	Model Number	2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Control (Y/N)	Initial Date of Service	Final Date of Service
CGS Tng Unit		600 hp								
Halliburton Unit #1		334 hp								
Halliburton Unit #2		334 hp								
Log/Wireline Unit		600 hp								

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
CGS Tng Unit	D	gal/hr	0.220					10^3 gal	1
Halliburton Unit #1	D	gal/hr	9.920	8.940	0.060			10^3 gal	1
Halliburton Unit #2	D	gal/hr	9.920		0.060			10^3 gal	1
Log/Wireline Unit	D	gal/hr	1.043	0.459				10^3 gal	1

Platform : GAIL

GENERAL FACILITY DESCRIPTION

Operator : CHEVRON
Offshore of : Ventura County
Treating Facility: Carpinteria

Tract Number : 205
Field/Area : SANTA CLARA UNIT

Drilling Start Year : 1987
Drilling Time (yrs) : 4
Yr of Decommissioning:

Peak Production Year : 1992
Peak Production (bbl/day): 13000

Power cable (Yes/No) : No

	1986	1987	1988	1989	Projected 1990	
Wells*	0	0	0	0	0	
Gas Production	0.0	0.0	0.0	0.0	0.0	10^6 scf
Oil Production	0.0	0.0	0.0	0.0	0.0	10^3 bbl

* Cumulative number of wells capable of producing.

FUEL DESCRIPTION

Fuel Code	Description	Lower Heating Value	Units	Sulfur Content	Units
D	Diesel		Btu/gal	0.0500	wt %
NG	Natural Gas		Btu/scf	250.00	ppmv

Platform: GAIL (con't)

FUEL CONSUMING EQUIPMENT: Reciprocating and Fired Units

Equipment Description	Size or Capacity	Manufacturer	Model Number	For Engines Only: 2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Controlled (Y/N)	Control Description
Air Compressor	19.2 hp	Hatz	2790					
Crane #1 (north)	225.0 hp	Caterpillar	3306	4	No	No		
Crane #2 (south)	545.0 hp	Caterpillar	3412	4	No	No		
Drilling Stndby Gen	975.0 hp	Detroit Diesel	EMD					
Firewater Pump	481.0 hp	Caterpillar	3408 TA	4	Yes	Yes		
Flare (10-100)	10^6 btu/hr			NA				
Life Capsule #1	36.0 hp	Whittaker	Perkins #4.108					
Life Capsule #2	36.0 hp	Whittaker	Perkins #4.108					
Life Capsule #3	36.0 hp	Whittaker	Perkins #4.108					
Oil Spill Power Pack	65.0 hp	Deutz Diesel	F-4L-912					
Standby Gen.	1840.0 hp	Detroit Diesel	16V-149	2	No	No		
Turbine Starter #1	150.0 hp	Detroit Diesel	463					
Turbine Starter #2	150.0 hp	Detroit Diesel	463					
Turbine Starter #3	150.0 hp	Detroit Diesel	463					

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption: Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Air Compressor	D	1.00 gal/hr			0.048	0.100	0.100	10^3 gal	1
Crane #1 (north)	D	11.80 gal/hr				6.245	6.245	10^3 gal	1
Crane #2 (south)	D	28.60 gal/hr				15.127	15.127	10^3 gal	1
Drilling Stndby Gen	D	90.00 gal/hr							2
Firewater Pump	D	25.00 gal/hr			0.222	1.133	1.133	10^3 gal	1
Flare (10-100)	NG	scfh			5.646	44.878	44.878	10^6 scf	3
Life Capsule #1	D	4.00 gal/hr							1
Life Capsule #2	D	4.00 gal/hr							1
Life Capsule #3	D	4.00 gal/hr							1
Oil Spill Power Pack	D	5.00 gal/hr							1

Platform: GAIL (con't)

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Standby Gen.	D	96.50 gal/hr			0.856	6.142	6.142	10^3 gal	2
Turbine Starter #1	D	7.80 gal/hr							1
Turbine Starter #2	D	7.80 gal/hr							1
Turbine Starter #3	D	463.00 gal/hr							1

Platform: GAIL (con't)

TURBINE EQUIPMENT

Equipment Description	Application	Engine Size	Manufacturer	Model Number	Fuel Consumption, Max Load NG (10^3 scf/hr)	Fuel Consumption, Max Load Diesel (gal/hr)	Water Injection (Y/N)	Water Injection Ratio, Maximum (lb water/lb fuel) NG	Water Injection Ratio, Maximum (lb water/lb fuel) Diesel
Turbine #1 (G-01)	Generator	4500.0 hp	Allison	501 KB	42.0	282.0	Yes	0.8	1.0
Turbine #2 (G-02)	Generator	4500.0 hp	Allison	501 KB	42.0	282.0	Yes	0.8	1.0
Turbine #3	Generator	4500.0 hp	Allison	501 KB	42.0	282.0	Yes	0.8	1.0

Fuel Consumption

Fuel Consumption Mode	Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Turbine #1 (G-01)							
NG with water inj.				112.681	112.681	10^6 scf	22
NG w/o water inj.						10^6 scf	
TOTAL NG				112.681	112.681	10^6 scf	
Dsl with water inj.			33.316	84.687	84.687	10^3 gal	23
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL			33.316	84.687	84.687	10^3 gal	
Turbine #2 (G-02)							
NG with water inj.				112.681	112.681	10^6 scf	22
NG w/o water inj.						10^6 scf	
TOTAL NG				112.681	112.681	10^6 scf	
Dsl with water inj.			33.316	84.687	84.687	10^3 gal	23
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL			33.316	84.687	84.687	10^3 gal	

Platform: GAIL (con't)

Fuel Consumption Mode	Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Turbine #3							
NG with water inj.				112.681	112.681	10^6 scf	22
NG w/o water inj.						10^6 scf	
TOTAL NG				112.681	112.681	10^6 scf	
Dsl with water inj.			33.316	84.687	84.687	10^3 gal	23
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL			33.316	84.687	84.687	10^3 gal	

Platform: GAIL (con't)

CONTRACTOR EQUIPMENT

Equipment Description	Owner	Engine Size	Manufacturer	Model Number	2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Control (Y/N)	Initial Date of Service	Final Date of Service
Logging Unit		168 hp	Cummings	V-504-C						
Wire Line Unit		353 hp	Detroit Diesel	Not avail.						

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Logging Unit	D	10.00 gal/hr							1
Wire Line Unit	D	15.00 gal/hr							1

Platform : GILDA

GENERAL FACILITY DESCRIPTION

Operator : UNOCAL
Offshore of : Ventura County
Treating Facility: Mandalay

Tract Number : 216
Field/Area : SANTA CLARA UNIT

Drilling Start Year : 1982
Drilling Time (yrs) : 3
Yr of Decommissioning: 2016

Peak Production Year : 1984
Peak Production (bbl/day): 6622

Power cable (Yes/No) : Yes

	1986	1987	1988	1989	Projected 1990	
Wells*	40	43	44	45	47	
Gas Production	3661.6	4968.4	2820.1	1851.8	1500.6	10^6 scf
Oil Production	2229.4	2186.6	1859.9	1828.7	1676.4	10^3 bbl

* Cumulative number of wells capable of producing.

FUEL DESCRIPTION

Fuel Code	Description	Lower Heating Value	Units	Sulfur Content	Units
D	Diesel	127600.0	Btu/gal	0.0500	wt %
NG	Natural Gas	1000.0	Btu/scf	20.000	ppmv

Platform: GILDA (con't)

FUEL CONSUMING EQUIPMENT: Reciprocating and Fired Units

Equipment Description	Size or Capacity	Manufacturer	Model Number	For Engines Only: 2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Controlled (Y/N)	Control Description
Crane #1	300.0 hp	Caterpillar	3406	4	Yes	No	No	
Crane #2	300.0 hp	Caterpillar	3406	4	Yes	Yes	No	
Emergency Gen #1	305.0 hp	Caterpillar	3406	4	Yes	Yes	No	
Emergency Gen #2	375.0 hp	Caterpillar	3408	4	Yes	Yes	No	
Flare (10-100)	10^6 scf			NA			No	
Heater Unit	2.0 mmBTU/hr	Uniflux					No	

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption: Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Crane #1	D	15.00 gal/hr	16.450	7.493	17.260	16.439	17.000	10^3 gal	1
Crane #2	D	15.00 gal/hr	16.450	7.493	17.260	16.439	17.000	10^3 gal	1
Emergency Gen #1	D	12.00 gal/hr	0.510	0.628	0.486	0.124	0.350	10^3 gal	1
Emergency Gen #2	D	12.00 gal/hr				0.152	1.300	10^3 gal	1
Flare (10-100)	NG	scfh	64.400	48.795	43.366	30.145	45.000	10^6 scf	3
Heater Unit	NG	scfh				23.638	24.000	10^6 scf	3

Platform: GILDA (con't)

CONTRACTOR EQUIPMENT

Equipment Description	Owner	Engine Size	Manufacturer	Model Number	2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Control (Y/N)	Initial Date of Service	Final Date of Service
Cementing Unit	BJ Services	340 hp	Detroit Diesel	8V92	4	Yes	No	No	1982	IN USE

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Cementing Unit	D	18.80 gal/hr	3.250	7.944	4.190	4.965	5.000	10^3 gal	2

Platform : GINA

GENERAL FACILITY DESCRIPTION

Operator : UNOCAL
Offshore of : Ventura County
Treating Facility: Mandalay

Tract Number : 202
Field/Area : PORT HUENEME

Drilling Start Year : 1982
Drilling Time (yrs) : 1
Yr of Decommissioning: 2010

Peak Production Year : 1983
Peak Production (bbl/day): 5000

Power cable (Yes/No) : Yes

	1986	1987	1988	1989	Projected 1990	
Wells*	6	6	7	7	7	
Gas Production	178.3	165.4	132.4	118.1	142.8	10^6 scf
Oil Production	664.0	635.3	594.5	474.3	384.0	10^3 bbl

* Cumulative number of wells capable of producing.

FUEL DESCRIPTION

Fuel Code	Description	Lower Heating Value	Units	Sulfur Content	Units
D	Diesel	127600.0	Btu/gal	0.0500	wt %
NG	Natural Gas	1000.0	Btu/scf	20.000	ppmv

Platform: GINA (con't)

FUEL CONSUMING EQUIPMENT: Reciprocating and Fired Units

Equipment Description	Size or Capacity	Manufacturer	Model Number	For Engines Only: 2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Controlled (Y/N)	Control Description
Crane	300.0 hp	Caterpillar	3406	4	Yes	No	No	
Emergency Generator	230.0 hp	Caterpillar	3306PC	4	Yes	No	No	
Vent	mmscf						No	

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption: Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Crane	D	15.00 gal/hr	0.287	0.407	1.564	5.387	2.000	10^3 gal	1
Emergency Generator	D	12.00 gal/hr	0.781	0.452	0.380	2.573	1.000	10^3 gal	1
Vent	NG	scfh			17.746	0.267	15.000	10^6 scf	12

Platform: GINA (con't)

CONTRACTOR EQUIPMENT

Equipment Description	Owner	Engine Size	Manufacturer	Model Number	2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Control (Y/N)	Initial Date of Service	Final Date of Service
Cement Unit	BJ Services	350 hp	Detroit Diesel	6V92	2	Yes	No	No	1983	In use

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Cement Unit	D	18.80 gal/hr			0.517			10^3 gal	1

Platform : GRACE

GENERAL FACILITY DESCRIPTION

Operator : CHEVRON
Offshore of : Ventura County
Treating Facility: Carpinteria

Tract Number : 217
Field/Area : SANTA CLARA UNIT

Drilling Start Year : 1981
Drilling Time (yrs) : 4
Yr of Decommissioning:

Peak Production Year : 1985
Peak Production (bbl/day): 2000

Power cable (Yes/No) : No

	1986	1987	1988	1989	Projected 1990	
Wells*	0	0	0	0	0	
Gas Production	1423.5	0.0	0.0	0.0	0.0	10^6 scf
Oil Production	657.0	0.0	0.0	0.0	0.0	10^3 bbl

* Cumulative number of wells capable of producing.

FUEL DESCRIPTION

Fuel Code	Description	Lower Heating Value	Units	Sulfur Content	Units
D	Diesel		Btu/gal	0.0500	wt %
NG	Natural Gas		Btu/scf	250.00	ppmv

Platform: GRACE (con't)

FUEL CONSUMING EQUIPMENT: Reciprocating and Fired Units

Equipment Description	Size or Capacity	Manufacturer	Model Number	For Engines Only: 2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Controlled (Y/N)	Control Description
Boom Boat	120.0 hp	Volvo-Penta	AQD40A					
Compressor--Standby	230.0 hp	Detroit Diesel	8.2LT					
Compressor--Standby	36.0 hp	Waukesha	VRD155U					
Compressor-BrthngAir	20.0 hp	Lister	ST2					
Crane #1	300.0 hp	General Motors	8V92	2	No	No		
Crane #2	300.0 hp	General Motors	8V92	2	No	No		
Firewater Pump	120.0 hp	John Deere	6359A					
Flare (10-100)	10^6 scf							
Life Capsule #1	30.0 hp	Lister	STW					
Life Capsule #2	30.0 hp	Lister	STW					
Life Capsule #3	37.0 hp	Westerbeke	WPDS-40					
Standby Gen	600.0 hp	Caterpillar	D-379	4				

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption: Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Boom Boat	D	9.00 gal/hr							1
Compressor--Standby	D	12.00 gal/hr							1
Compressor--Standby	D	1.80 gal/hr							1
Compressor-BrthngAir	D	1.10 gal/hr							1
Crane #1	D	20.00 gal/hr	0.540	0.720	0.720	0.720	0.720	10^3 gal	1
Crane #2	D	20.00 gal/hr	0.540	0.720	0.720	0.720	0.720	10^3 gal	1
Firewater Pump	D	6.30 gal/hr	0.180	0.240	0.240	0.240	0.240	10^3 gal	1
Flare (10-100)	NG	scfh	2.270	1.869	2.169	2.368	2.368	10^6 scf	3
Life Capsule #1	D	4.00 gal/hr							1
Life Capsule #2	D	4.00 gal/hr							1
Life Capsule #3	D	5.00 gal/hr							1
Standby Gen	D	31.40 gal/hr	0.180	0.240	0.240	0.240	0.240	10^3 gal	1

Platform: GRACE (con't)

Fuel Consumption Mode	Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Turbine #3							
NG with water inj.						10^6 scf	
NG w/o water inj.	88.683	201.018	96.489	85.558	85.558	10^6 scf	4
TOTAL NG	88.683	201.018	96.489	85.558	85.558	10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.	33.503	64.889	58.238	32.600	32.600	10^3 gal	5
TOTAL DIESEL	33.503	64.889	58.238	32.600	32.600	10^3 gal	

Platform: GRACE (con't)

TURBINE EQUIPMENT

Equipment Description	Application	Engine Size	Manufacturer	Model Number	Fuel Consumption, Max Load NG (10^3 scf/hr)	Fuel Consumption, Max Load Diesel (gal/hr)	Water Injection (Y/N)	Water Injection Ratio, Maximum (lb water/lb fuel) NG	Water Injection Ratio, Maximum (lb water/lb fuel) Diesel
Turbine #1	Generator	1253.0 hp	Solar Centaur	GS-4000	38.4	240.0	No		
Turbine #2	Generator	1253.0 hp	Solar Centaur	GS-4000	38.4	240.0	No		
Turbine #3	Generator	1253.0 hp	Solar Centaur	GS-4000	38.4	240.0	No		

Fuel Consumption

Fuel Consumption Mode	Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Turbine #1							
NG with water inj.						10^6 scf	
NG w/o water inj.	88.683	201.018	96.489	85.558	85.558	10^6 scf	4
TOTAL NG	88.683	201.018	96.489	85.558	85.558	10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.	33.503	64.889	58.238	32.600	32.600	10^3 gal	5
TOTAL DIESEL	33.503	64.889	58.238	32.600	32.600	10^3 gal	
Turbine #2							
NG with water inj.						10^6 scf	
NG w/o water inj.	88.683	201.018	96.489	85.558	85.558	10^6 scf	4
TOTAL NG	88.683	201.018	96.489	85.558	85.558	10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.	33.503	64.889	58.238	32.600	32.600	10^3 gal	5
TOTAL DIESEL	33.503	64.889	58.238	32.600	32.600	10^3 gal	

Platform: GRACE (con't)

CONTRACTOR EQUIPMENT

Equipment Description	Owner	Engine Size	Manufacturer	Model Number	2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Control (Y/N)	Initial Date of Service	Final Date of Service
Barnacle Removal Com		8 hp	Lombardini	1 cyl.						
Gold State Wire Line		40 hp	Deutz Diesel	3 cyl.						
Haliburton Acid Pmpn		40 hp	Detroit Diesel	3 cyl.						
Haliburton Acidizing		150 hp	Detroit Diesel	Double V8						
Haliburton Pump #1		40 hp	Detroit Diesel	3 cyl.						
Haliburton Pumps		40 hp	Detroit Diesel	3 cyl.						

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Barnacle Removal Com	D	1.00 gal/hr							1
Gold State Wire Line	D	5.50 gal/hr							1
Haliburton Acid Pmpn	D	5.50 gal/hr							1
Haliburton Acidizing	D	24.00 gal/hr							1
Haliburton Pump #1	D	5.50 gal/hr							1
Haliburton Pumps	D	5.50 gal/hr							1

Platform : HABITAT

GENERAL FACILITY DESCRIPTION

Operator : TEXACO
Offshore of : Santa Barbara County
Treating Facility: Habitat

Tract Number : 234,246
Field/Area : PITAS POINT UNIT

Drilling Start Year : 1982
Drilling Time (yrs) : 4
Yr of Decommissioning: 2012

Peak Production Year : 1986
Peak Production (mcf/day): 70600

Power cable (Yes/No) : Yes

	1986	1987	1988	1989	Projected 1990	
Wells*	13	12	11	9	12	
Gas Production	25769.0	20738.0	16688.0	12120.0	15000.0	10^6 scf
Oil Production	29.2	23.8	13.6	9.8	10.5	10^3 bbl

* Cumulative number of wells capable of producing.

FUEL DESCRIPTION

Fuel Code	Description	Lower Heating Value	Units	Sulfur Content	Units
D	Diesel	130000.0	Btu/gal	0.0500	wt %
NG	Natural Gas	101.6	Btu/scf		ppmv

Platform: HABITAT (con't)

FUEL CONSUMING EQUIPMENT: Reciprocating and Fired Units

Equipment Description	Size or Capacity	Manufacturer	Model Number	For Engines Only: 2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Controlled (Y/N)	Control Description
Crane #1	150.0 hp	Detroit Diesel	SK 800	4	No	No	No	
Crane #2	200.0 hp	Detroit Diesel	SK 3500	4	No	No	No	
Emerg/Texaco Gen	470.0 hp	Caterpillar	3412	4	No	No	No	
Gas Comp Engine	1.2 MMBtu/hr	Cooper	8SGTB	4	Yes	Yes	Yes	clean burn eng., non-selec. cat. reduc.
Glycol Reboiler	1.0 MMbtu/hr	Natco	5GR-1280-P200N3					clean burn, non-sel
Vent	8.0 inches	NA	NA					

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption: Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Crane #1	D	10.00 gal/hr	2.055	1.496	2.601	3.780	2.500	10^3 gal	1
Crane #2	D	10.00 gal/hr	2.977	1.588	10.823	6.770	5.550	10^3 gal	1
Emerg/Texaco Gen	D	8.00 gal/hr	1.210	0.780	0.722	0.378	0.770	10^3 gal	1
Gas Comp Engine	NG	5.10 scfh			15.187	38.505	42.000	10^6 scf	18
Glycol Reboiler	NG	0.50 scfh	4.430	4.627	4.442	4.345	4.460	10^6 scf	7
Vent	NG	scfh	0.900	2.656	25.039	8.515	9.280	10^6 scf	13

Platform: HABITAT (con't)

CONTRACTOR EQUIPMENT

Equipment Description	Owner	Engine Size	Manufacturer	Model Number	2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Control (Y/N)	Initial Date of Service	Final Date of Service
CSG Power Tongs	N/A	375 hp	N/A	N/A					1-86	2-86
Cementing Unit #1	Halliburton	374 hp	Detroit Diesel	8V71	2	No	No	No	7-83	in use
Cementing Unit #2	Halliburton	374 hp	Detroit Diesel	8V71	2	No	No	No	7-83	in use
Cementing Unit #3	Halliburton	180 hp	Detroit Diesel	353	2	No	No	No	7-83	in use
Draw Works #1	Pool Offshore	456 hp	Detroit Diesel	12V71	2	No	No	No	3-88	1-89
Draw Works #2	Pool Offshore	456 hp	Detroit Diesel	12V71	2	No	No	No	3-88	1-89
OSCA Filter System	OSCA	465 hp	Detroit Diesel	271	4	No	Yes	No	4-88	in use
Otis Nitro	Otis	152 hp	Detroit Diesel	6V92	4	Yes	No	No	10-88	in use
Pool Mud Pump	Pool Offshore	725 hp	Detroit Diesel	16V71T	2	Yes	No	No	3-88	1-89
Pool Standby Gen	Pool Offshore	375 hp	Caterpillar	3406	4	Yes	No	No	3-88	1-89
Sand Blstrs	Pennington	600 hp	N/A	N/A					1-88	2-88
Standby/Aux Gen	Pool Offshore	1600 hp	Detroit Diesel	16V149	4	Yes	No	No	1-86	in use
Welding Generator	B & C Veco	378 hp	Caterpillar	3406	4	Yes	Yes	No	8-89	9-89
Welding Unit #1	B&C Veco/Penngt	42 hp	Miller	Big Blue 400D	4	No	No	No	11-87	in use
Welding Unit #2	B&C Veco/Penngt	42 hp	Miller	Big Blue 400 D	4	No	No	No	11-87	in use
Welding Unit #3	B&C Veco Penngt	42 hp	Miller	Big Blue 400 D	4	No	No	No	11-87	in use
Welding Unit #4	B&C Veco Penngt	42 hp	Miller	Big Blue 400 D	4	No	No	No	11-87	in use
Welding Unit #5	B&C Veco Penngt	42 hp	Miller	Big Blue 400 D	4	No	No	No	11-87	in use
Welding Unit #6	B&C Veco Penngt	42 hp	Miller	Big Blue 400 D	4	No	No	No	11-87	in use
Wireline Unit #1	Hanson	63 hp	Ford Diesel	DNW 94256	4	No	No	No	1-86	in use
Wireline Unit #2	McCullough	90 hp	Detroit Diesel	543	2	No	No	No	4-88	7-88
Wireline Unit #3	Dialog	90 hp	Detroit Diesel	371	2	Yes	No	No	8-88	in use
Wireline Unit #4	Gearhart	90 hp	N/A	N/A					10-88	10-88
Wireline Unit #5	Archer Reed	102 hp	Ford Diesel	182	4	No	No	No	3-89	3-89
Wireline Unit #6	Welex	90 hp	N/A	N/A					11-88	11-88
Wireline Unit #7	Atlas	40 hp	Ford Diesel	T5	4	No	No	No	11-89	in use
Wireline Unit #8	Schlumberger	120 hp	Detroit Diesel	471	4	No	No	No	2-90	in use

Platform: HABITAT (con't)

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
CSG Power Tongs	D	2.25 gal/hr	0.150					10^3 gal	1
Cementing Unit #1	D	6.20 gal/hr	0.079		0.722	0.140	0.684	10^3 gal	1
Cementing Unit #2	D	6.20 gal/hr	0.079		0.722	0.140	0.684	10^3 gal	1
Cementing Unit #3	D	2.10 gal/hr	0.051		0.456	0.100	0.432	10^3 gal	1
Draw Works #1	D	11.00 gal/hr			25.527	2.387		10^3 gal	1
Draw Works #2	D	11.00 gal/hr			25.527	2.387		10^3 gal	1
OSCA Filter System	D	6.00 gal/hr			1.474		0.750	10^3 gal	1
Otis Nitro	D	4.00 gal/hr			0.030	0.334	0.200	10^3 gal	1
Pool Mud Pump	D	10.00 gal/hr			6.011	0.100		10^3 gal	2
Pool Standby Gen	D	10.00 gal/hr			0.430	0.130	0.320	10^3 gal	1
Sand Blstrs	D	1.00 gal/hr			0.065			10^3 gal	1
Standby/Aux Gen	D	12.50 gal/hr	0.730					10^3 gal	2
Welding Generator	D	9.00 gal/hr				1.850		10^3 gal	1
Welding Unit #1	D	1.25 gal/hr		0.130	0.095	0.156	0.125	10^3 gal	1
Welding Unit #2	D	1.25 gal/hr		0.130	0.095	0.156	0.125	10^3 gal	1
Welding Unit #3	D	1.25 gal/hr		0.130	0.095	0.156	0.125	10^3 gal	1
Welding Unit #4	D	1.25 gal/hr		0.130	0.095	0.156	0.125	10^3 gal	1
Welding Unit #5	D	1.25 gal/hr		0.125	0.095	0.060	0.100	10^3 gal	1
Welding Unit #6	D	1.25 gal/hr			0.095		0.030	10^3 gal	1
Wireline Unit #1	D	2.00 gal/hr	0.518	0.176	0.894	0.236	0.230	10^3 gal	1
Wireline Unit #2	D	3.00 gal/hr			0.375			10^3 gal	1
Wireline Unit #3	D	3.00 gal/hr			0.090	0.016	0.060	10^3 gal	1
Wireline Unit #4	D	3.00 gal/hr			0.030			10^3 gal	1
Wireline Unit #5	D	2.00 gal/hr				0.036	0.030	10^3 gal	1
Wireline Unit #6	D	2.00 gal/hr			0.050			10^3 gal	1
Wireline Unit #7	D	2.00 gal/hr				0.020	0.020	10^3 gal	1
Wireline Unit #8	D	3.00 gal/hr					0.150	10^3 gal	1

Platform : HARVEST

GENERAL FACILITY DESCRIPTION

Operator : TEXACO
Offshore of : Santa Barbara County
Treating Facility: Gaviota

Tract Number : 315
Field/Area : POINT ARGUELLO

Drilling Start Year : 1987
Drilling Time (yrs) : 3
Yr of Decommissioning: 2016

Peak Production Year : 1994
Peak Production (bbl/day): 46000

Power cable (Yes/No) : No

	1986	1987	1988	1989	Projected 1990	
Wells*	0	0	19	19	20	
Gas Production	0.0	0.0	0.0	0.0	0.0	10^6 scf
Oil Production	0.0	0.0	0.0	0.0	0.0	10^3 bbl

* Cumulative number of wells capable of producing.

FUEL DESCRIPTION

Fuel Code	Description	Lower Heating Value	Units	Sulfur Content	Units
D	Diesel		Btu/gal	0.0500	wt %
NG	Natural Gas		Btu/scf	15000	ppmv

Platform: HARVEST (con't)

FUEL CONSUMING EQUIPMENT: Reciprocating and Fired Units

Equipment Description	Size or Capacity	Manufacturer	Model Number	For Engines Only: 2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Controlled (Y/N)	Control Description
Crane #1	400.0 hp	Caterpillar	3408	4	Yes	Yes	No	
Crane #2	400.0 hp	Caterpillar	3408	4	Yes	Yes	No	
Crane #3	244.0 hp	Caterpillar	3306	4	Yes	No	No	
Firewater Pump #1	500.0 hp	Detroit Diesel	12V71	2	Yes	Yes	No	
Firewater Pump #2	500.0 hp	Detroit Diesel	12V71	2	Yes	Yes	No	
Flare (0-10)		NA						
Otis Nitr/Tbg #1	55.0 hp	Cummins	NA	4	No	No	No	
Texaco/Stndby Gen #1	955.0 hp	Detroit Diesel	149 TI	2	Yes	Yes	Yes	catalytic convertor
Texaco/Stndby Gen #2	955.0 hp	Detroit Diesel	149 TI	2	Yes	Yes	Yes	catalytic convertor

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption: Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Crane #1	D	20.00 gal/hr	1.034	19.972	8.339	5.849	5.000	10^3 gal	1
Crane #2	D	20.00 gal/hr	1.034	19.972	5.794	3.973	3.900	10^3 gal	1
Crane #3	D	14.00 gal/hr	0.631	12.183	5.087	3.568	3.500	10^3 gal	1
Firewater Pump #1	D	25.00 gal/hr	0.025	0.287	0.309	0.282	0.250	10^3 gal	1
Firewater Pump #2	D	25.00 gal/hr	0.025	0.287	0.309	0.282	0.250	10^3 gal	1
Flare (0-10)	NG	scfh		65.022	4.881			10^6 scf	7
Otis Nitr/Tbg #1	D	2.00 gal/hr					0.700	10^3 gal	1
Texaco/Stndby Gen #1	D	50.00 gal/hr	0.003	0.850	3.466	5.930	5.900	10^3 gal	19
Texaco/Stndby Gen #2	D	50.00 gal/hr	0.002	0.925	3.226	5.944	5.900	10^3 gal	19

Platform: HARVEST (con't)

TURBINE EQUIPMENT

Equipment Description	Application	Engine Size	Manufacturer	Model Number	Fuel Consumption, Max Load NG (10^3 scf/hr)	Fuel Consumption, Max Load Diesel (gal/hr)	Water Injection (Y/N)	Water Injection Ratio, Maximum (lb water/lb fuel) NG	Water Injection Ratio, Maximum (lb water/lb fuel) Diesel
Turbine Gas Comp #1	Compressor	4250.0 hp	Detroit Diesel	501KC	44.2		Yes	0.8	
Turbine Gas Comp #2	Compressor	4250.0 hp	Detroit Diesel	501KC	44.2		Yes	0.8	
Turbine Gas Comp #3	Compressor	4250.0 hp	Detroit Diesel	501KC	44.2		Yes	0.8	
Turbine Gen #1	Generator	4250.0 hp	Detroit Diesel	501KB	44.2	312.5	Yes	0.8	1.0
Turbine Gen #2	Generator	4250.0 hp	Detroit Diesel	501KB	44.2	312.5	Yes	0.8	1.0
Turbine Gen #3	Generator	4250.0 hp	Detroit Diesel	501KB	44.2	312.5	Yes	0.8	1.0
Turbine Gen #4	Generator	4250.0 hp	Detroit Diesel	501KB	44.2	312.5	Yes	0.8	1.0
Turbine Gen #5	Generator	4250.0 hp	Detroit Diesel	501KB	44.2	312.5	Yes	0.8	1.0

Fuel Consumption

Fuel Consumption Mode	Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Turbine Gas Comp #1							
NG with water inj.						10^6 scf	
NG w/o water inj.						10^6 scf	
TOTAL NG						10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL						10^3 gal	
Turbine Gas Comp #2							
NG with water inj.						10^6 scf	
NG w/o water inj.						10^6 scf	
TOTAL NG						10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL						10^3 gal	

Platform: HARVEST (con't)

Fuel Consumption Mode	Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Fuel Consumption							
Turbine Gas Comp #3							
NG with water inj.						10^6 scf	
NG w/o water inj.						10^6 scf	
TOTAL NG						10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL						10^3 gal	
Turbine Gen #1							
NG with water inj.			6.900			10^6 scf	20
NG w/o water inj.						10^6 scf	
TOTAL NG			6.900			10^6 scf	
Dsl with water inj.	56.060	386.115	348.655	181.683	180.000	10^3 gal	21
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL	56.060	386.115	348.655	181.683	180.000	10^3 gal	
Turbine Gen #2							
NG with water inj.			11.079		11.000	10^6 scf	20
NG w/o water inj.						10^6 scf	
TOTAL NG			11.079		11.000	10^6 scf	
Dsl with water inj.	55.359	503.163	333.301	95.105	95.000	10^3 gal	21
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL	55.359	503.163	333.301	95.105	95.000	10^3 gal	
Turbine Gen #3							
NG with water inj.			6.900			10^6 scf	20
NG w/o water inj.						10^6 scf	
TOTAL NG			6.900			10^6 scf	
Dsl with water inj.	29.887	727.324	245.718	424.329	424.000	10^3 gal	21
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL	29.887	727.324	245.718	424.329	424.000	10^3 gal	

Platform: HARVEST (con't)

Fuel Consumption Mode	Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Turbine Gen #4							
NG with water inj.			7.900			10^6 scf	20
NG w/o water inj.						10^6 scf	
TOTAL NG			7.900			10^6 scf	
Dsl with water inj.	120.335	831.622	390.008	454.927	454.000	10^3 gal	21
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL	120.335	831.622	390.008	454.927	454.000	10^3 gal	
Turbine Gen #5							
NG with water inj.			3.400			10^6 scf	20
NG w/o water inj.						10^6 scf	
TOTAL NG			3.400			10^6 scf	
Dsl with water inj.	74.568	744.607	79.178	283.908	283.000	10^3 gal	21
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL	74.568	744.607	79.178	283.908	283.000	10^3 gal	

Platform: HARVEST (con't)

CONTRACTOR EQUIPMENT

Equipment Description	Owner	Engine Size	Manufacturer	Model Number	2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Control (Y/N)	Initial Date of Service	Final Date of Service
Cement Pump #1	Helmerich&Payne	350 hp	GMC	871	4	No	No	No		
Cement Pump #2	Helmerich&Payne	350 hp	GMC	871	4	No	No	No		
H & P Gen (Drl Rig G	Helmerich&Payne	1120 hp	EMD	8-645	4	No	No	No		
H & P Gen (Drl Rig G	Helmerich&Payne	1120 hp	EMD	8-645	4	No	No	No		
Logging Unit	Helmerich&Payne	145 hp	Cummins	V378	4	No	No	No		
Temp Air Comp #1	Helmerich&Payne	475 hp	Detroit Diesel	12V71N	4	No	No	No		
Temp Air Comp #2	Helmerich&Payne	475 hp	Detroit Diesel	12V71N	4	No	No	No		
Temp Air Comp #3	Helmerich&Payne	113 hp	Detroit Diesel	371N	4	No	No	No		
Tong Svc/Nitrogen	Otis	55 hp	Cummins	NA	4	No	No	No		

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Cement Pump #1	D	19.00 gal/hr	0.131	2.077	0.495	0.495	0.400	10^3 gal	1
Cement Pump #2	D	19.00 gal/hr	0.054	0.861	0.495	0.495	0.400	10^3 gal	1
H & P Gen (Drl Rig G	D	55.00 gal/hr	1.210	2.415	1.515	1.515	1.500	10^3 gal	2
H & P Gen (Drl Rig G	D	55.00 gal/hr	1.210	2.415	1.515	1.515	1.500	10^3 gal	2
Logging Unit	D	7.00 gal/hr						10^3 gal	1
Temp Air Comp #1	D	26.00 gal/hr	0.786					10^3 gal	1
Temp Air Comp #2	D	26.00 gal/hr	0.786					10^3 gal	1
Temp Air Comp #3	D	5.00 gal/hr	0.187					10^3 gal	1
Tong Svc/Nitrogen	D	2.00 gal/hr						10^3 gal	1

Platform : HENRY

GENERAL FACILITY DESCRIPTION

Operator : Oryx Energy
Offshore of : Santa Barbara County
Treating Facility: Rincon

Tract Number : 240
Field/Area : CARPINTERIA

Drilling Start Year : 1980
Drilling Time (yrs) : 3
Yr of Decommissioning: 2010

Peak Production Year : 1983
Peak Production (bbl/day): 5000

Power cable (Yes/No) : No

	1986	1987	1988	Projected 1989	1990	
Wells*	22	22	22	22	22	
Gas Production	1058.5	848.4	645.6	455.8	455.8	10^6 scf
Oil Production	1350.5	1189.5	1050.8	844.8	844.8	10^3 bbl

* Cumulative number of wells capable of producing.

FUEL DESCRIPTION

Fuel Code	Description	Lower Heating Value	Units	Sulfur Content	Units
D	Diesel		Btu/gal	0.4800	wt %
NG	Natural Gas		Btu/scf	3.0000	ppmv

Platform: HENRY (con't)

FUEL CONSUMING EQUIPMENT: Reciprocating and Fired Units

Equipment Description	Size or Capacity	Manufacturer	Model Number	For Engines Only: 2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Controlled (Y/N)	Control Description
Crane #1	370.0 hp	Detroit Diesel	12V-71N	4	No	Yes	No	
Crane #2	130.0 hp	Detroit GM	471	4	No	Yes	No	
Emergency Gen	510.0 hp	Caterpillar	3412 TA	4	No	Yes	No	
Firewater Pump	150.0 hp	Caterpillar	3208	4	No	Yes	No	
Vent								

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption: Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Crane #1	D	35.00 gal/hr	4.423	2.260	2.115	1.193	1.193	10^3 gal	1
Crane #2	D	7.50 gal/hr	1.097	0.560	0.705	0.398	0.398	10^3 gal	1
Emergency Gen	D	35.00 gal/hr	0.012	0.012	0.012	0.012	0.012	10^3 gal	1
Firewater Pump	D	4.60 gal/hr	0.012	0.012	0.012	0.012	0.012	10^3 gal	1
Vent	NG	scfh	9.760	4.265	0.879	0.370	0.370	10^6 scf	14

Platform: HENRY (con't)

TURBINE EQUIPMENT

Equipment Description	Application	Engine Size	Manufacturer	Model Number	Fuel Consumption, Max Load NG (10^3 scf/hr)	Fuel Consumption, Max Load Diesel (gal/hr)	Water Injection (Y/N)	Water Injection Ratio, Maximum (lb water/lb fuel) NG	Water Injection Ratio, Maximum (lb water/lb fuel) Diesel
Turbine Comp #1	Compressor	960.0 hp	TurboSystems	TC 9A	9.0		No		
Turbine Comp #2	Compressor	960.0 hp	TurboSystems	TC 9A	9.0		No		
Turbine Generator	Generator	3350.0 hp	Solar	Centaur GCI-CB-GE	20.8		No		

Fuel Consumption

Fuel Consumption Mode	Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Turbine Comp #1							
NG with water inj.						10^6 scf	
NG w/o water inj.	27.026					10^6 scf	6
TOTAL NG	27.026					10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL						10^3 gal	
Turbine Comp #2							
NG with water inj.						10^6 scf	
NG w/o water inj.	34.974					10^6 scf	6
TOTAL NG	34.974					10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL						10^3 gal	

Platform: HENRY (con't)

Fuel Consumption Mode	Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Turbine Generator							
NG with water inj.						10^6 scf	
NG w/o water inj.	263.000	259.880	177.080	258.693	258.693	10^6 scf	4
TOTAL NG	263.000	259.880	177.080	258.693	258.693	10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL						10^3 gal	

Platform : HERMOSA

GENERAL FACILITY DESCRIPTION

Operator : CHEVRON
Offshore of : Santa Barbara County
Treating Facility: Gaviota

Tract Number : OCS P-0316
Field/Area : POINT ARGUELLO

Drilling Start Year : 1987
Drilling Time (yrs) : 3
Yr of Decommissioning:

Peak Production Year : 1993
Peak Production (bbl/day): 27000

Power cable (Yes/No) : No

	1986	1987	1988	1989	Projected 1990	
Wells*	0	0	0	0	0	
Gas Production	0.0	0.0	0.0	0.0	0.0	10^6 scf
Oil Production	0.0	0.0	0.0	0.0	0.0	10^3 bbl

* Cumulative number of wells capable of producing.

FUEL DESCRIPTION

Fuel Code	Description	Lower Heating Value	Units	Sulfur Content	Units
D	Diesel #2		Btu/gal	0.0500	wt %
NG	Natural Gas		Btu/scf	250.00	ppmv

Platform: HERMOSA (con't)

FUEL CONSUMING EQUIPMENT: Reciprocating and Fired Units

Equipment Description	Size or Capacity	Manufacturer	Model Number	For Engines Only: 2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Controlled (Y/N)	Control Description
Air Compressor #1	24.0 hp	Hatz	Z790		No	No		
Air Compressor #2	24.0 hp	Hatz	Z790		No	No		
Crane #1 (west)	365.0 hp	Caterpillar	3408 DITA	4	No	No	Yes	Low NOx Engine
Crane #2 (east)	365.0 hp	Caterpillar	3408 DITA	4	No	No	Yes	Low NOx Engine
Diesel Pump	16.0 hp	Onan	1 cyl.					
Drilling Standby Gen	1200.0 hp	Caterpillar	D399					
Firewater Pump	408.0 hp	Caterpillar	3406 DITA	4	No	No		
Flare (10-100)								
Life Capsule #1	50.0 hp	Whittaker	Perkins #4.154					
Life Capsule #2	50.0 hp	Whittaker	Perkins #4.154					
Life Capsule #3	50.0 hp	Whittaker	Perkins #4.154					
Standby Gen #1	1425.0 hp	Detroit Diesel	16V-149T	2	Yes	No	Yes	Low NOx Engine

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption: Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Air Compressor #1	D	1.20 gal/hr				0.002	0.002	10^3 gal	1
Air Compressor #2	D	1.20 gal/hr				0.002	0.002	10^3 gal	1
Crane #1 (west)	D	18.90 gal/hr		9.448	4.956	2.124	2.124	10^3 gal	24
Crane #2 (east)	D	18.90 gal/hr		9.448	4.956	2.124	2.124	10^3 gal	24
Diesel Pump	D	1.00 gal/hr							1
Drilling Standby Gen	D	62.90 gal/hr							2
Firewater Pump	D	21.40 gal/hr		0.371	0.351	0.383	0.383	10^3 gal	1
Flare (10-100)	NG	scfh		9.833	3.051	3.996	3.996	10^6 scf	3
Life Capsule #1	D	4.00 gal/hr							1
Life Capsule #2	D	4.00 gal/hr							1
Life Capsule #3	D	4.00 gal/hr							1
Standby Gen #1	D	75.00 gal/hr		2.135	16.753	3.700	3.700	10^3 gal	25

Platform: HERMOSA (con't)

TURBINE EQUIPMENT

Equipment Description	Application	Engine Size	Manufacturer	Model Number	Fuel Consumption, Max Load NG (10^3 scf/hr)	Diesel (gal/hr)	Water Injection (Y/N)	Water Injection Ratio, Maximum (lb water/lb fuel) NG	Diesel
Turbine #1	Generator	3800.0 hp	Solar Centaur	GT-4500	42.0	282.0	Yes	0.8	0.8
Turbine #2	Generator	3800.0 hp	Solar Centaur	GT-4500	42.0	282.0	Yes	0.8	0.8
Turbine #3	Generator	3800.0 hp	Solar Centaur	GT-4500	42.0	282.0	Yes	0.8	0.8
Turbine #4	Generator	3800.0 hp	Solar Centaur	GT-4500	42.0	282.0	Yes	0.8	0.8

Fuel Consumption

Fuel Consumption Mode	Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Turbine #1							
NG with water inj.				6.810	6.810	10^6 scf	26
NG w/o water inj.						10^6 scf	
TOTAL NG				6.810	6.810	10^6 scf	
Dsl with water inj.		520.232	321.782	264.026	264.026	10^3 gal	27
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL		520.232	321.782	264.026	264.026	10^3 gal	
Turbine #2							
NG with water inj.				6.810	6.810	10^6 scf	26
NG w/o water inj.						10^6 scf	
TOTAL NG				6.810	6.810	10^6 scf	
Dsl with water inj.		520.232	321.782	264.026	264.026	10^3 gal	27
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL		520.232	321.782	264.026	264.026	10^3 gal	

Platform: HERMOSA (con't)

Fuel Consumption Mode	Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
	Fuel Consumption						
Turbine #3							
NG with water inj.				6.810	6.810	10^6 scf	26
NG w/o water inj.						10^6 scf	
TOTAL NG				6.810	6.810	10^6 scf	
Dsl with water inj.		520.232	321.782	264.026	264.026	10^3 gal	27
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL		520.232	321.782	264.026	264.026	10^3 gal	
Turbine #4							
NG with water inj.				6.810	6.810	10^6 scf	26
NG w/o water inj.						10^6 scf	
TOTAL NG				6.810	6.810	10^6 scf	
Dsl with water inj.		520.232	321.782	264.026	264.026	10^3 gal	27
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL		520.232	321.782	264.026	264.026	10^3 gal	

Platform: HERMOSA (con't)

CONTRACTOR EQUIPMENT

Equipment Description	Owner	Engine Size	Manufacturer	Model Number	2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Control (Y/N)	Initial Date of Service	Final Date of Service
Drilling Gen #1		600 hp								

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Drilling Gen #1	D	gal/hr		1.437					1

Platform : HIDALGO

GENERAL FACILITY DESCRIPTION

Operator : CHEVRON
Offshore of : Santa Barbara County
Treating Facility: Gaviota
Tract Number : 450
Field/Area : POINT ARGUELLO

Drilling Start Year : 1987
Drilling Time (yrs) : 5
Yr of Decommissioning:
Peak Production Year : 1993
Peak Production (bbl/day): 20000

Power cable (Yes/No) : No

	1986	1987	1988	1989	Projected 1990	
Wells*	0	0	0	0	0	
Gas Production	0.0	0.0	0.0	0.0	0.0	10^6 scf
Oil Production	0.0	0.0	0.0	0.0	0.0	10^3 bbl

* Cumulative number of wells capable of producing.

FUEL DESCRIPTION

Fuel Code	Description	Lower Heating Value	Units	Sulfur Content	Units
D	Diesel		Btu/gal	0.0500	wt %
NG	Natural Gas		Btu/scf	250.00	ppmv

Platform: HIDALGO (con't)

FUEL CONSUMING EQUIPMENT: Reciprocating and Fired Units

Equipment Description	Size or Capacity	Manufacturer	Model Number	For Engines Only: 2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Controlled (Y/N)	Control Description
Crane #1 (west)	400.0 hp	Caterpillar	3408 DITA				Yes	Low NOx Engine
Crane #2 (east)	400.0 hp	Caterpillar	3408 DITA				Yes	Low NOx Engine
Diesel Pump	7.3 hp	Onan	1 cyl.					
Drilling Standby Gen	1200.0 hp	Caterpillar	D399					
Firewater Pump	400.0 hp	Detroit Diesel	V1271					
Flare (<10)								
Life Capsule #1	50.0 hp	Whittaker	Perkins #4.154					
Life Capsule #2	50.0 hp	Whittaker	Perkins #4.154					
Life Capsule #3	50.0 hp	Whittaker	Perkins #4.154					
Open Rescue Boat	9.9 hp	Johnson	not avail.					
Standby Generator	1735.0 hp	Detroit Diesel	16V-149TI				Yes	Low NOx Engine
Turbine Starter #1	225.0 hp	Caterpillar	3208 T					
Turbine Starter #2	225.0 hp	Caterpillar	3208 T					
Turbine Starter #3	225.0 hp	Caterpillar	3208 T					

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption: Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Crane #1 (west)	D	21.00 gal/hr		4.526	7.259	2.406	2.406	10^3 gal	24
Crane #2 (east)	D	21.00 gal/hr		4.526	7.259	2.406	2.406	10^3 gal	24
Diesel Pump	D	0.40 gal/hr							1
Drilling Standby Gen	D	62.90 gal/hr							2
Firewater Pump	D	25.00 gal/hr			0.186	0.548	0.548	10^3 gal	1
Flare (<10)	NG	scfh			2.945	6.269	6.269	10^6 scf	7
Life Capsule #1	D	4.00 gal/hr							1
Life Capsule #2	D	4.00 gal/hr							1
Life Capsule #3	D	4.00 gal/hr							1
Open Rescue Boat	D	1.00 gal/hr							1

Platform: HIDALGO (con't)

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Standby Generator	D	91.00 gal/hr		15.390	2.740	2.511	2.511	10^3 gal	25
Turbine Starter #1	D	11.80 gal/hr							1
Turbine Starter #2	D	11.80 gal/hr							1
Turbine Starter #3	D	11.80 gal/hr							1

Platform: HIDALGO (con't)

TURBINE EQUIPMENT

Equipment Description	Application	Engine Size	Manufacturer	Model Number	Fuel Consumption, Max Load NG (10^3 scf/hr)	Fuel Consumption, Max Load Diesel (gal/hr)	Water Injection (Y/N)	Water Injection Ratio, Maximum (lb water/lb fuel) NG	Water Injection Ratio, Maximum (lb water/lb fuel) Diesel
Turbine #1	Generator	3800.0 hp	Solar Centaur	GT-4500	42.0	282.0	Yes	0.8	0.8
Turbine #2	Generator	3800.0 hp	Solar Centaur	GT-4500	42.0	282.0	Yes	0.8	0.8
Turbine #3	Generator	3800.0 hp	Solar Centaur	GT-4500	42.0	282.0	Yes	0.8	0.8
Turbine #4	Generator	3800.0 hp	Solar Centaur	GT-4500	42.0	282.0	Yes	0.8	0.8

Fuel Consumption

Fuel Consumption Mode	Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Turbine #1							
NG with water inj.				15.502	15.502	10^6 scf	26
NG w/o water inj.						10^6 scf	
TOTAL NG				15.502	15.502	10^6 scf	
Dsl with water inj.		173.094	270.709	239.581	238.581	10^3 gal	27
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL		173.094	270.709	239.581	238.581	10^3 gal	
Turbine #2							
NG with water inj.				15.502	15.502	10^6 scf	26
NG w/o water inj.						10^6 scf	
TOTAL NG				15.502	15.502	10^6 scf	
Dsl with water inj.		173.094	270.709	239.581	239.581	10^3 gal	27
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL		173.094	270.709	239.581	239.581	10^3 gal	

Platform: HIDALGO (con't)

Fuel Consumption Mode	Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Turbine #3							
NG with water inj.				15.502	15.502	10^6 scf	26
NG w/o water inj.						10^6 scf	
TOTAL NG				15.502	15.502	10^6 scf	
Dsl with water inj.		173.094	270.709	239.581	239.581	10^3 gal	27
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL		173.094	270.709	239.581	239.581	10^3 gal	
Turbine #4							
NG with water inj.				15.502	15.502	10^6 scf	26
NG w/o water inj.						10^6 scf	
TOTAL NG				15.502	15.502	10^6 scf	
Dsl with water inj.		173.094	270.709	239.581	239.581	10^3 gal	27
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL		173.094	270.709	239.581	239.581	10^3 gal	

Platform: HIDALGO (con't)

CONTRACTOR EQUIPMENT

Equipment Description	Owner	Engine Size	Manufacturer	Model Number	2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Control (Y/N)	Initial Date of Service	Final Date of Service
Rental Generator		450 hp								
Welding Unit		600 hp								

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Rental Generator	D	gal/hr		6.196				10^3 gal	1
Welding Unit	D	gal/hr		4.657				10^3 gal	1

Platform : HILLHOUSE

GENERAL FACILITY DESCRIPTION

Operator : Oryx Energy
Offshore of : Santa Barbara County
Treating Facility: Rincon

Tract Number : 240
Field/Area : DOS CUADRAS

Drilling Start Year : 1970
Drilling Time (yrs) : 6
Yr of Decommissioning: 2000

Peak Production Year : 1977
Peak Production (bbl/day): 15000

Power cable (Yes/No) : No

	1986	1987	1988	1989	Projected 1990	
Wells*	45	45	45	45	45	
Gas Production	547.5	665.2	814.4	801.7	801.7	10^6 scf
Oil Production	1131.5	1173.2	1082.4	936.3	936.3	10^3 bbl

* Cumulative number of wells capable of producing.

FUEL DESCRIPTION

Fuel Code	Description	Lower Heating Value	Units	Sulfur Content	Units
D	Diesel		Btu/gal	0.4800	wt %
NG	Natural Gas		Btu/scf	2.0000	ppmv

Platform: HILLHOUSE (con't)

FUEL CONSUMING EQUIPMENT: Reciprocating and Fired Units

Equipment Description	Size or Capacity	Manufacturer	Model Number	For Engines Only: 2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Controlled (Y/N)	Control Description
Crane #1	90.0 hp	Detroit Diesel	RA 3080	4	No	Yes	No	
Crane #2	190.0 hp	Detroit Diesel	TC 2184	4	No	Yes	No	
Emergency Gen #1	725.0 hp	Caterpillar	D-348	4	No	Yes	No	
Emergency Gen #2	725.0 hp	Caterpillar	D-348	4	No	Yes	No	
Firewater Pump	150.0 hp	Caterpillar	3208	4	No	Yes	No	
Vent		..		NA				

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption: Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Crane #1	D	9.00 gal/hr	0.176	0.179	0.235	0.235	0.235	10^3 gal	1
Crane #2	D	11.00 gal/hr	0.356	0.361	0.305	0.305	0.305	10^3 gal	1
Emergency Gen #1	D	45.00 gal/hr	2.400	2.400	2.400	0.870	0.870	10^3 gal	2
Emergency Gen #2	D	45.00 gal/hr	2.400	2.400	2.400	0.870	0.870	10^3 gal	2
Firewater Pump	D	6.00 gal/hr	0.012	0.012	0.012	0.012	0.012	10^3 gal	1
Vent	NG	scfh	22.620	14.305	2.726	4.009	4.009	10^6 scf	15

Platform: HILLHOUSE (con't)

TURBINE EQUIPMENT

Equipment Description	Application	Engine Size	Manufacturer	Model Number	Fuel Consumption, Max Load NG (10^3 scf/hr)	Diesel (gal/hr)	Water Injection (Y/N)	Water Injection Ratio, Maximum (lb water/lb fuel) NG	Diesel
Gas Turbine #1	Generator	1072.0 hp	Solar	Saturn MKII GSC-1200	7.0		No		
Gas Turbine #2	Generator	1072.0 hp	Solar	Saturn MKII GSC-1200	7.0		No		
Turbine Comp #1	Compressor	900.0 hp	TurboSystems	TC 98	7.0		No		
Turbine Comp #2	Compressor	900.0 hp	TurboSystems	TC 98	7.0		No		

Fuel Consumption

Fuel Consumption Mode	Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Gas Turbine #1							
NG with water inj.						10^6 scf	
NG w/o water inj.	82.000	62.925	57.532	48.919	48.919	10^6 scf	4
TOTAL NG	82.000	62.925	57.532	48.919	48.919	10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL						10^3 gal	
Gas Turbine #2							
NG with water inj.						10^6 scf	
NG w/o water inj.	82.000	62.925	57.532	48.919	48.919	10^6 scf	4
TOTAL NG	82.000	62.925	57.532	48.919	48.919	10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL						10^3 gal	

Platform: HILLHOUSE (con't)

Fuel Consumption Mode	Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Turbine Comp #1							
NG with water inj.						10^6 scf	
NG w/o water inj.	82.000	56.875	47.535	50.393	50.393	10^6 scf	6
TOTAL NG	82.000	56.875	47.535	50.393	50.393	10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL						10^3 gal	
Turbine Comp #2							
NG with water inj.						10^6 scf	
NG w/o water inj.	82.000	56.875	47.535	50.393	50.393	10^6 scf	6
TOTAL NG	82.000	56.875	47.535	50.393	50.393	10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL						10^3 gal	

Platform : HOGAN

GENERAL FACILITY DESCRIPTION

Operator : PHILLIPS
Offshore of : Santa Barbara County
Treating Facility: La Conchita

Tract Number : 166
Field/Area : CARPINTERIA

Drilling Start Year : 1968
Drilling Time (yrs) : 4
Yr of Decommissioning: 2005

Peak Production Year : 1973
Peak Production (bbl/day): 4000

Power cable (Yes/No) : Yes

	1986	1987	1988	1989	Projected 1990	
Wells*	0	0	0	39	39	
Gas Production	18.3	583.6	838.9	976.2	1451.7	10^6 scf
Oil Production	237.3	759.0	716.3	625.6	634.6	10^3 bbl

NOTE: Gas and Oil Production for 1987-1990 is the combined total for HOGAN and HOUCHIN.

* Cumulative number of wells capable of producing.

FUEL DESCRIPTION

Fuel Code	Description	Lower Heating Value	Units	Sulfur Content	Units
D	Diesel		Btu/gal	0.3750	wt %
NG	Natural Gas		Btu/scf	1.0000	ppmv

Platform: HOGAN (con't)

FUEL CONSUMING EQUIPMENT: Reciprocating and Fired Units

Equipment Description	Size or Capacity	Manufacturer	Model Number	For Engines Only: 2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Controlled (Y/N)	Control Description
Crane #1	154.0 hp	Manitow SC 2900	6-71					
Crane #2	96.0 hp	Unit - 500	3-71					
Emergency Generator	510.0 hp	Caterpillar	D-379	4	No	No	No	
Firewater Pump	110.0 hp	Caterpillar	D-330	4	No	No	No	
Vent								

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption: Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission factor Code
Crane #1	D	7.97 gal/hr	0.253	0.180	0.156	0.475		10^3 gal	1
Crane #2	D	5.23 gal/hr	0.157	0.113	0.098	0.296		10^3 gal	1
Emergency Generator	D	8.70 gal/hr	0.213	0.218	0.248	0.616		10^3 gal	1
Firewater Pump	D	6.70 gal/hr	0.157	0.157	0.158	0.492		10^3 gal	1
Vent	NG	scfh	0.100	0.446				10^6 scf	16

Platform: HOGAN (con't)

CONTRACTOR EQUIPMENT

Equipment Description	Owner	Engine Size	Manufacturer	Model Number	2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Control (Y/N)	Initial Date of Service	Final Date of Service
Mud Pump	Pride Petr Serv	400 hp	Caterpillar	3408	4	No	No	No	1-90	In use
Pulling Unit	Pride Petr Serv	273 hp	Detroit Diesel	8V-71	2	No	No	No	1-90	In use
Rotary Table	Pride Petr Serv	450 hp	Detroit Diesel	6V-92T	4	Yes	No	No	1-90	In use

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Mud Pump	D	8.00 gal/hr					1.000	10^3 gal	1
Pulling Unit	D	8.00 gal/hr					7.000	10^3 gal	1
Rotary Table	D	6.00 gal/hr					1.000	10^3 gal	1

Platform : HONDO

GENERAL FACILITY DESCRIPTION

Operator : EXXON
Offshore of : Santa Barbara County
Treating Facility: OS&T/Las Flores

Tract Number : 188
Field/Area : SANTA YNEZ UNIT

Drilling Start Year : 1977
Drilling Time (yrs) : 5
Yr of Decommissioning: 2007

Peak Production Year : 1985
Peak Production (bbl/day): 33000

Power cable (Yes/No) : No

	1986	1987	1988	1989	Projected 1990	
Wells*	24	23	23	23	24	
Gas Production	20404.1	20991.7	21065.8	23431.9	23431.9	10^6 scf
Oil Production	11101.0	9586.0	9890.0	9517.0	9517.0	10^3 bbl

* Cumulative number of wells capable of producing.

FUEL DESCRIPTION

Fuel Code	Description	Lower Heating Value	Units	Sulfur Content	Units
D1	Diesel (1986)	137000.0	Btu/gal	0.0500	wt %
D2	Diesel (1987)	137000.0	Btu/gal	0.0900	wt %
D3	Diesel (1988)	137000.0	Btu/gal	0.0450	wt %
D4	Diesel (1989)	137000.0	Btu/gal	0.0450	wt %
NG1	Natural Gas (Turbines)	1150.0	Btu/scf	30.000	ppmv
NG2	Natural Gas (Base Flare)	1155.0	Btu/scf	10000	ppmv
NG3	Natural Gas (Upset Flare)	1040.0	Btu/scf	9500.0	ppmv
NG4	Natural Gas		Btu/scf	5000.0	ppmv

Platform: HONDO (con't)

FUEL CONSUMING EQUIPMENT: Reciprocating and Fired Units

Equipment Description	Size or Capacity	Manufacturer	Model Number	For Engines Only: 2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Controlled (Y/N)	Control Description
Crane #1	160.0 hp	Detroit Diesel	6-71	4	No	No	No	
Crane #2	160.0 hp	Detroit Diesel	6-71	4	No	No	No	
Emergency Generator	1220.0 hp	Caterpillar	D-3512	4	Yes	Yes	No	
Firewater Pump #1	210.0 hp	Caterpillar	3306	4	Yes	Yes	No	
Firewater Pump #2	210.0 hp	Caterpillar	3306	4	Yes	Yes	No	
Flare HP	186.0 10^6 SCFD	Kaidair, Inc						
Flare LP	1.0 10^6 SCFD	Kaidair, Inc						

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption: Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Crane #1	D3	11.20 gal/hr	13.870	12.138	23.201	16.107		10^3 gal	1
Crane #2	D3	11.20 gal/hr	13.870	12.138	23.201	16.107		10^3 gal	1
Emergency Generator	D23	61.50 gal/hr		0.244		3.775		10^3 gal	8
Firewater Pump #1	D123	13.10 gal/hr	6.130	2.214	1.552	0.891		10^3 gal	1
Firewater Pump #2	D123	13.10 gal/hr	6.130	2.214	1.552	0.891		10^3 gal	1
Flare HP	NG3	1068.60 scfh	66.930	55.040	45.335	39.353		10^6 scf	7
Flare LP	NG2	50.00 scfh	13.920	13.000	12.598	12.563		10^6 scf	7

Platform: HONDO (con't)

TURBINE EQUIPMENT

Equipment Description	Application	Engine Size	Manufacturer	Model Number	Fuel Consumption, Max Load NG (10^3 scf/hr)	Diesel (gal/hr)	Water Injection (Y/N)	Water Injection Ratio, Maximum (lb water/lb fuel) NG	Diesel
Turbine #1		1072.0 hp							
Turbine #2		1072.0 hp							
Turbine #3		1072.0 hp							

Fuel Consumption

Fuel Consumption Mode	Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Turbine #1							
NG with water inj.						10^6 scf	
NG w/o water inj.	23.027	2.477				10^6 scf	9
TOTAL NG	23.027	2.477				10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.	16.070	1.779				10^3 gal	10
TOTAL DIESEL	16.070	1.779				10^3 gal	
Turbine #2							
NG with water inj.						10^6 scf	
NG w/o water inj.	23.027	2.477				10^6 scf	9
TOTAL NG	23.027	2.477				10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.	16.070	1.779				10^3 gal	10
TOTAL DIESEL	16.070	1.779				10^3 gal	

Platform: HONDO (con't)

Fuel Consumption Mode	Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Turbine #3							
NG with water inj.						10^6 scf	
NG w/o water inj.	23.027	2.477				10^6 scf	9
TOTAL NG	23.027	2.477				10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.	16.070	1.779				10^3 gal	10
TOTAL DIESEL	16.070	1.779				10^3 gal	

Platform: HONDO (con't)

CONTRACTOR EQUIPMENT

Equipment Description	Owner	Engine Size	Manufacturer	Model Number	2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Control (Y/N)	Initial Date of Service	Final Date of Service
Cementing Unit (#1 E	BJ Titan Srvcs	319 hp	Detroit Diesel	AB 71	2	No	Yes	No	12-88	3-90
Cementing Unit (#2 E	BJ Titan Srvcs	319 hp	Detroit Diesel	AB 71	2	No	Yes	No	12-88	3-90
Cementing Unit (#3 E	Halliburton	319 hp	Detroit Diesel	AB 71	2	No	Yes	No	5-87	11-88
Drilling Generator	New Orleans Drl	1550 hp	Detroit Diesel	16v-149-TI	4	Yes	Yes	No	5-87	3-90

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Cementing Unit (#1 E	D3	16.50 gal/hr				1.000		10^3 gal	1
Cementing Unit (#2 E	D3	16.50 gal/hr				1.000		10^3 gal	1
Cementing Unit (#3 E	D23	16.50 gal/hr		0.500	1.000			10^3 gal	1
Drilling Generator	D23	78.80 gal/hr		17.204	8.418	8.418		10^3 gal	8

Platform : HOUCHIN

GENERAL FACILITY DESCRIPTION

Operator : PHILLIPS
Offshore of : Santa Barbara County
Treating Facility: La Conchita

Tract Number : 166
Field/Area : CARPINTERIA

Drilling Start Year : 1969
Drilling Time (yrs) : 4
Yr of Decommissioning: 1999

Peak Production Year : 1974
Peak Production (bbl/day): 11000

Power cable (Yes/No) : Yes

	1986	1987	1988	1989	Projected 1990	
Wells*	0	0	0	33	33	
Gas Production	29.2	0.0	0.0	0.0	0.0	10^6 scf
Oil Production	401.5	0.0	0.0	0.0	0.0	10^3 bbl

NOTE: Gas and Oil Production for 1987-1990 is the combined total for HOGAN and HOUCHIN.

* Cumulative number of wells capable of producing.

FUEL DESCRIPTION

Fuel Code	Description	Lower Heating Value	Units	Sulfur Content	Units
D	Diesel		Btu/gal	0.3750	wt %
NG	Natural Gas		Btu/scf	1.0000	ppmv

Platform: HOUCHIN (con't)

FUEL CONSUMING EQUIPMENT: Reciprocating and Fired Units

Equipment Description	Size or Capacity	Manufacturer	Model Number	For Engines Only: 2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Controlled (Y/N)	Control Description
Crane #1	154.0 hp	Manitow SC 2900	6-71					
Crane #2	96.0 hp	Unit - 500	3-71					
Emergency Generator	510.0 hp	Caterpillar	D-379	4	No	No	No	
Firewater Pump	110.0 hp	Caterpillar	D-330	4	No	No	No	
Vent								

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption: Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Crane #1	D	7.97 gal/hr	2.665	1.136	1.589	1.076		10^3 gal	1
Crane #2	D	5.23 gal/hr	1.661	0.708	0.990	0.670		10^3 gal	1
Emergency Generator	D	8.70 gal/hr	0.209	0.187	0.313	0.226		10^3 gal	1
Firewater Pump	D	6.70 gal/hr	0.161	0.148	0.147	0.174		10^3 gal	1
Vent	NG	scfh	0.100	0.446				10^6 scf	16

Platform: HOUCHIN (con't)

CONTRACTOR EQUIPMENT

Equipment Description	Owner	Engine Size	Manufacturer	Model Number	2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Control (Y/N)	Initial Date of Service	Final Date of Service
Mud Pump	Pride Petr Serv	273 hp	Detroit Diesel	8V-71	2	No	No	No	8-86	In use
Pulling Unit	Pride Petr Serv	273 hp	Detroit Diesel	8V-71	2	No	No	No	8-86	In use
Rotary Table	Pride Petr Serv	450 hp	Detroit Diesel	6V-92T	4	Yes	No	No	8-86	In use

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Mud Pump	D	8.00 gal/hr	0.500	1.000	1.000	1.000	1.000	10^3 gal	1
Pulling Unit	D	8.00 gal/hr	3.000	7.000	7.000	7.000	7.000	10^3 gal	1
Rotary Table	D	6.00 gal/hr	0.500	1.000	1.000	1.000	1.000	10^3 gal	1

Platform : IRENE

GENERAL FACILITY DESCRIPTION

Operator : UNOCAL
Offshore of : Santa Barbara County
Treating Facility: Lompoc

Tract Number : 0441
Field/Area : POINT PEDERNALES

Drilling Start Year : 1986
Drilling Time (yrs) : 5
Yr of Decommissioning: 2016

Peak Production Year : 1990
Peak Production (bbl/day): 25000

Power cable (Yes/No) : Yes

	1986	1987	1988	1989	Projected 1990	
Wells*	0	11	11	17	18	
Gas Production	0.0	932.0	1257.0	1503.0	1503.0	10^6 scf
Oil Production	0.0	4741.0	6281.0	7326.0	7326.0	10^3 bbl

* Cumulative number of wells capable of producing.

FUEL DESCRIPTION

Fuel Code	Description	Lower Heating Value	Units	Sulfur Content	Units
D	Diesel		Btu/gal	0.0500	wt %
NG86	Natural Gas (1986)		Btu/scf	834.00	ppmv
NG87	Natural Gas (1987)	1222.0	Btu/scf	570.00	ppmv
NG88	Natural Gas (1988)	1203.9	Btu/scf	823.00	ppmv
NG89	Natural Gas (1989)	1224.8	Btu/scf	665.00	ppmv

Platform: IRENE (con't)

FUEL CONSUMING EQUIPMENT: Reciprocating and Fired Units

Equipment Description	Size or Capacity	Manufacturer	Model Number	For Engines Only: 2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Controlled (Y/N)	Control Description
Crane #1	140.0 hp	FMC	218		No	No	No	
Crane #2	140.0 hp	FMC	238		No	No	No	
Emergency Gen #1	270.0 hp	Caterpillar	D-3408	4	No	No	No	
Emergency Gen #2	1000.0 hp	Caterpillar	D-399	4	No	No	No	
Emergency Gen #3	1000.0 hp	Caterpillar	D-399	4	No	No	No	
Flare (10-100)	750.0 10^6 btu/hr	Nat'l Air Oil	NAO Multi Jet Mix	NA				
Flare Pilot and Purg	0.1 10^6 btu/hr			NA				

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption: Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Crane #1	D	9.85 gal/hr	0.636	0.439	0.358	0.515	0.500	10^3 gal	1
Crane #2	D	9.85 gal/hr	1.479	1.448	0.535	2.062	2.000	10^3 gal	1
Emergency Gen #1	D	24.85 gal/hr	0.636	0.067	0.275	0.203	0.200	10^3 gal	1
Emergency Gen #2	D	70.00 gal/hr	3.660	1.984	0.775	2.049	2.100	10^3 gal	2
Emergency Gen #3	D	70.00 gal/hr	3.660	1.984	0.775	2.050	2.100	10^3 gal	2
Flare (10-100)	NG	750000.0 scfh		2.995	5.685	9.936	10.000	10^6 scf	3
Flare Pilot and Purg	NG	45.00 scfh	0.380	0.380	0.380	0.380	0.380	10^6 scf	3

Platform : UNIONA

GENERAL FACILITY DESCRIPTION

Operator : UNOCAL
Offshore of : Santa Barbara County
Treating Facility: Rincon

Tract Number : 241
Field/Area : DOS CUADRAS

Drilling Start Year : 1969
Drilling Time (yrs) : 6
Yr of Decommissioning: 2006

Peak Production Year : 1970
Peak Production (bbl/day): 33000

Power cable (Yes/No) : Yes

	1986	1987	1988	1989	Projected 1990	
Wells*	47	47	48	47	47	
Gas Production	1025.2	934.0	911.7	1044.9	969.9	10^6 scf
Oil Production	1363.2	1224.0	1181.8	945.9	1360.2	10^3 bbl

* Cumulative number of wells capable of producing.

FUEL DESCRIPTION

Fuel Code	Description	Lower Heating Value	Units	Sulfur Content	Units
D	Diesel	127600.0	Btu/gal	0.0500	wt %
NG	Natural Gas	1000.0	Btu/scf	20.000	ppmv

Platform: UNIONA (con't)

FUEL CONSUMING EQUIPMENT: Reciprocating and Fired Units

Equipment Description	Size or Capacity	Manufacturer	Model Number	For Engines Only: 2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Controlled (Y/N)	Control Description
Crane #1	247.0 hp	Detroit Diesel	671	2	No	No	No	
Crane #2	247.0 hp	Detroit Diesel	371	2	No	No	No	
Emergency Gen	21.8 hp	Onam	12DJC4R3721R	2	No	Yes	No	
Vent								

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption: Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Crane #1	D	12.00 gal/hr	2.986	2.712	2.868	4.118	3.000	10^3 gal	1
Crane #2	D	5.00 gal/hr	6.594	5.988	6.331	4.118	5.500	10^3 gal	1
Emergency Gen	D	3.00 gal/hr	0.096	0.372	0.321	0.102	0.300	10^3 gal	1
Vent	NG	scfh	4.640	5.783	21.370	1.899	10.000	10^6 scf	12

Platform: UNIONA (con't)

TURBINE EQUIPMENT

Equipment Description	Application	Engine Size	Manufacturer	Model Number	Fuel Consumption, Max Load NG (10^3 scf/hr)	Diesel (gal/hr)	Water Injection (Y/N)	Water Injection Ratio, Maximum (lb water/lb fuel) NG	Diesel
Turbine Compressor	Compressor	1100.0 hp			28.2				
Turbine Generator	Generator	3830.0 hp	Centura Solar	GC1-C8-10	28.2		No		

Fuel Consumption

Fuel Consumption Mode	Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Turbine Compressor							
NG with water inj.						10^6 scf	
NG w/o water inj.	92.710	91.488	92.232	14.860		10^6 scf	6
TOTAL NG	92.710	91.488	92.232	14.860		10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL						10^3 gal	
Turbine Generator							
NG with water inj.						10^6 scf	
NG w/o water inj.	248.170	247.105	207.102	275.653	280.000	10^6 scf	4
TOTAL NG	248.170	247.105	207.102	275.653	280.000	10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL						10^3 gal	

Platform : UNIONB

GENERAL FACILITY DESCRIPTION

Operator : UNOCAL
Offshore of : Santa Barbara County
Treating Facility: Rincon

Tract Number : 241
Field/Area : DOS CUADRAS

Drilling Start Year : 1970
Drilling Time (yrs) : 6
Yr of Decommissioning: 2006

Peak Production Year : 1971
Peak Production (bbl/day): 28000

Power cable (Yes/No) : Yes

	1986	1987	1988	1989	Projected 1990	
Wells*	42	41	42	42	42	
Gas Production	742.1	771.3	852.8	945.4	866.4	10^6 scf
Oil Production	1363.2	1224.0	1181.8	945.9	930.6	10^3 bbl

* Cumulative number of wells capable of producing.

FUEL DESCRIPTION

Fuel Code	Description	Lower Heating Value	Units	Sulfur Content	Units
D	Diesel	127600.0	Btu/gal	0.0500	wt %
NG	Natural Gas	1000.0	Btu/scf	20.000	ppmv

Platform: UNIONB (con't)

FUEL CONSUMING EQUIPMENT: Reciprocating and Fired Units

Equipment Description	Size or Capacity	Manufacturer	Model Number	For Engines Only: 2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Controlled (Y/N)	Control Description
Crane #1	247.0 hp	Detroit Diesel	671	2	No	No	No	
Crane #2	247.0 hp	Detroit Diesel	371	2	No	No	No	
Emergency Generator	21.8 hp	Onam	12DJC4R3721R	2	No	Yes	No	
Vent	mmscf			NA				

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption: Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Crane #1	D	12.00 gal/hr	3.058	3.400	2.101	3.056	3.000	10^3 gal	1
Crane #2	D	5.00 gal/hr	6.752	7.505	4.639	3.056	4.000	10^3 gal	1
Emergency Generator	D	3.00 gal/hr	0.096	0.102	0.321	0.065	0.100	10^3 gal	1
Vent	NG	scfh	3.000		15.977	8.058	10.000	10^6 scf	12

Platform: UNIONB (con't)

TURBINE EQUIPMENT

Equipment Description	Application	Engine Size	Manufacturer	Model Number	Fuel Consumption, Max Load NG (10^3 scf/hr)	Fuel Consumption, Max Load Diesel (gal/hr)	Water Injection (Y/N)	Water Injection Ratio, Maximum (lb water/lb fuel) NG	Water Injection Ratio, Maximum (lb water/lb fuel) Diesel
Gas Turbine	Generator	3830.0 hp	Centura Solar	GS-4000	28.2		No		
Turbine Compressor	Compressor	1100.0 hp			21.4				

Fuel Consumption

Fuel Consumption Mode	Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Gas Turbine							
NG with water inj.						10^6 scf	
NG w/o water inj.	194.160	187.234	187.758	231.126	230.000	10^6 scf	4
TOTAL NG	194.160	187.234	187.758	231.126	230.000	10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL						10^3 gal	
Turbine Compressor							
NG with water inj.						10^6 scf	
NG w/o water inj.	53.760	84.170	92.232	14.868		10^6 scf	6
TOTAL NG	53.760	84.170	92.232	14.868		10^6 scf	
Dsl with water inj.						10^3 gal	
Dsl w/o water inj.						10^3 gal	
TOTAL DIESEL						10^3 gal	

Platform : UNIONC

GENERAL FACILITY DESCRIPTION

Operator : UNOCAL
Offshore of : Santa Barbara County
Treating Facility: Rincon

Tract Number : 241
Field/Area : DOS CUADRAS

Drilling Start Year : 1977
Drilling Time (yrs) : 3
Yr of Decommissioning: 2006

Peak Production Year : 1978
Peak Production (bbl/day): 4500

Power cable (Yes/No) : Yes

	1986	1987	1988	1989	Projected 1990	
Wells*	23	22	23	23	24	
Gas Production	260.1	247.9	194.5	258.0	228.6	10^6 scf
Oil Production	681.0	587.4	528.3	449.4	317.4	10^3 bbl

* Cumulative number of wells capable of producing.

FUEL DESCRIPTION

Fuel Code	Description	Lower Heating Value	Units	Sulfur Content	Units
D	Diesel	127600.0	Btu/gal	0.0500	wt %
NG	Natural Gas	1000.0	Btu/scf	20.000	ppmv

Platform: UNIONC (con't)

FUEL CONSUMING EQUIPMENT: Reciprocating and Fired Units

Equipment Description	Size or Capacity	Manufacturer	Model Number	For Engines Only: 2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Controlled (Y/N)	Control Description
Crane #1	247.0 hp	Detroit Diesel	671	2	No	No	No	
Crane #2	247.0 hp	Detroit Diesel	371	2	No	No	No	
Emergency Generator	21.8 hp	Onam	12DJC4R3721S	4	No	Yes	No	
Firewater Pump	85.0 hp	Caterpillar	3304PC	4	No	Yes	No	
Vent				NA				

Equipment Description	Fuel Type	Fuel Consumption at Maximum Load	Annual Fuel Consumption: Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units	Emission Factor Code
Crane #1	D	12.00 gal/hr	2.229	1.651	2.003	3.529	2.000	10^3 gal	1
Crane #2	D	5.00 gal/hr	4.921	3.646	4.422	3.529	3.900	10^3 gal	1
Emergency Generator	D	3.00 gal/hr	0.096	0.102	0.258	0.108	0.200	10^3 gal	1
Firewater Pump	D	3.50 gal/hr	0.096	0.096	0.147	0.151	0.100	10^3 gal	1
Vent	NG	scfh	2.830	8.467	20.447	17.388	17.000	10^6 scf	12

Appendix B
Platform Equipment Emission Factors and Emission Rates

EMISSION FACTORS

Code	THC	NOx	SO2	CO	TSP	Units	Description
1	37.50	469.00	31.20	102.00	33.50	lbs/1000 gal	Cranes, Halliburton, Esc Cap
2	14.00	500.00	0.00	130.00	50.00	lbs/1000 gal	Emerg. Gen, Rig Gen, Stdby Gen
3	5.80	140.00	0.00	35.00	5.00	lbs/mmscf	Flares, Therm Htr
4	42.00	413.00	0.00	115.00	14.00	lbs/mmscf	NG Turb
5	5.60	67.80	0.00	15.40	5.00	lbs/1000 gal	D Turb
6	23.00	300.00	0.00	120.00	14.00	lbs/mmscf	NG Compr
7	8.00	100.00	0.00	20.00	5.00	lbs/mmscf	Glycol Reboil, Flare
8	59.10	364.00	0.00	43.70	33.50	lbs/1000 gal	Hondo Emerg Gen
9	12.60	310.00	0.00	246.00	14.00	lbs/mmscf	Hondo NG Turb
10	3.70	51.00	7.00	52.90	5.00	lbs/1000 gal	Hondo D Turb
11	10.20	25.77	0.00	69.30	5.00	lbs/1000 gal	Turb Gen w/water inj. (Diesel)
12	46000.00	0.00	0.00	0.00	0.00	lbs/mmscf	Gina, A, B, C Vent
13	44568.00	0.00	0.00	0.00	0.00	lbs/mmscf	Habitat Vent
14	56000.00	0.00	0.00	0.00	0.00	lbs/mmscf	Henry Vent
15	58000.00	0.00	0.00	0.00	0.00	lbs/mmscf	Hillhouse Vent
16	61560.00	0.00	0.00	0.00	0.00	lbs/mmscf	Hogan and Houchin Vent
17	42.00	123.90	0.00	115.00	14.00	lbs/mmscf	NG Turb w/ water inj.
18	23.00	30.00	0.00	120.00	14.00	lbs/1000 gal	Habitat, Cooper 8SGTB
19	7.00	500.00	0.00	65.00	50.00	lbs/1000 gal	Harvest, DD 149TI
20	136.59	204.41	0.00	115.00	14.00	lbs/mmscf	Harvest, NG Turb controlled
21	9.54	21.97	0.00	15.40	5.00	lbs/1000 gal	Harvest, Dsl Turb controlled
22	136.59	123.90	0.00	115.00	14.00	lbs/mmscf	Gail, NG Turb controlled
23	9.54	20.34	0.00	15.40	5.00	lbs/1000 gal	Gail, Dsl Turb controlled
24	37.50	375.20	31.20	102.00	33.50	lbs/1000 gal	Herm/Hidalg dsl controlled
25	13.00	400.00	60.00	130.00	50.00	lbs/1000 gal	Herm/Hidalg dsl controlled
26	109.20	123.90	0.00	115.00	14.00	lbs/mmscf	Herm/Hidalg NG Turb cntrlled
27	14.48	20.34	0.00	15.40	5.00	lbs/1000 gal	Herm/Hidalg Dsl Turb cntrlled
51	32.80	550.00	0.00	41.40	50.00	lbs/1000 gal	Vessels, uncontrolled
52	32.80	415.00	0.00	41.40	50.00	lbs/1000 gal	Vessels, turbo/intercl w/TRet
53	32.80	330.00	0.00	41.40	50.00	lbs/1000 gal	Vessels, turbo/enh int w/TRet

NOTE: Most SO2 emission factors are based on the sulfur content of the fuel.

Platform: EDITH

Date: 10/12/90

ESTIMATED ANNUAL EMISSION RATES

EQUIPMENT	FUEL TYPE	THC Emissions (tons)					NOx Emissions (tons)					SO2 Emissions (tons)				
		1986	1987	1988	1989	1990	1986	1987	1988	1989	1990	1986	1987	1988	1989	1990
Crane #1 (north)	D	0.027	0.027	0.025	0.195	0.094	0.338	0.338	0.310	2.440	1.173	0.022	0.022	0.021	0.162	0.078
Crane #2 (south)	D				0.195	0.094				2.440	1.173				0.162	0.078
Emergency Generator	D	0.002	0.002	0.002	0.006	0.002	0.060	0.060	0.055	0.205	0.060	0.001	0.001	0.001	0.003	0.001
Firewater Pump	D	0.005	0.005	0.004	0.020	0.005	0.056	0.056	0.052	0.249	0.056	0.004	0.004	0.003	0.017	0.004
Flare (Low)	NG															
Flare (high)	NG	0.014	0.010	0.012	0.022	0.015	0.342	0.247	0.294	0.539	0.350	0.103	0.074	0.088	0.162	0.105
Thermal Htr (10-100)	NG	0.092	0.097	0.089	0.036	0.058	2.226	2.344	2.148	0.866	1.400	0.669	0.705	0.646	0.260	0.421
TOTAL		0.140	0.141	0.132	0.474	0.268	3.022	3.045	2.859	6.739	4.212	0.799	0.806	0.759	0.766	0.687

EQUIPMENT	FUEL TYPE	CO Emissions (tons)					TSP Emissions (tons)					Annual Average				
		1986	1987	1988	1989	1990	1986	1987	1988	1989	1990	THC	NOx	SO2	CO	TSP
Crane #1 (north)	D	0.073	0.073	0.067	0.531	0.255	0.024	0.024	0.022	0.174	0.084	0.074	0.919	0.061	0.200	0.066
Crane #2 (south)	D				0.531	0.255				0.174	0.084	0.144	1.806	0.120	0.393	0.129
Emergency Generator	D	0.016	0.016	0.014	0.053	0.016	0.006	0.006	0.006	0.021	0.006	0.002	0.088	0.001	0.023	0.009
Firewater Pump	D	0.012	0.012	0.011	0.054	0.012	0.004	0.004	0.004	0.018	0.004	0.008	0.094	0.006	0.020	0.007
Flare (Low)	NG															
Flare (high)	NG	0.085	0.062	0.073	0.135	0.088	0.012	0.009	0.011	0.019	0.013	0.015	0.354	0.107	0.089	0.013
Thermal Htr (10-100)	NG	0.557	0.586	0.537	0.216	0.350	0.080	0.084	0.077	0.031	0.050	0.074	1.797	0.540	0.449	0.064
TOTAL		0.743	0.749	0.702	1.520	0.976	0.126	0.127	0.120	0.437	0.241	0.317	5.058	0.836	1.174	0.287

Platform: ELLEN

Date: 10/12/90

ESTIMATED ANNUAL EMISSION RATES

EQUIPMENT	FUEL TYPE	THC Emissions (tons) 1986	1987	1988	1989	1990	NOx Emissions (tons) 1986	1987	1988	1989	1990	SO2 Emissions (tons) 1986	1987	1988	1989	1990
Crane #1 (east)	D	0.191	0.207	0.177	0.091	0.092	2.383	2.593	2.210	1.139	1.149	0.159	0.172	0.147	0.076	0.076
Crane #2 (center)	D	0.191	0.207	0.177	0.091	0.092	2.383	2.593	2.210	1.139	1.149	0.159	0.172	0.147	0.076	0.076
Escape Capsule	D	0.000	0.000	0.000	0.000	0.000	0.002	0.003	0.002	0.006	0.006	0.000	0.000	0.000	0.000	0.000
Flare (10-100)	NG	0.076	0.062				1.845	1.502				1.775	1.445			
Rig Generator #1	D	0.238	0.448	0.449	0.104	0.107	8.487	15.992	16.050	3.704	3.829	0.076	0.144	0.144	0.033	0.034
Rig Generator #2	D	0.238	0.448	0.449	0.104	0.107	8.487	15.992	16.050	3.704	3.829	0.076	0.144	0.144	0.033	0.034
Rig Generator #3	D	0.238	0.448	0.449	0.104	0.107	8.487	15.992	16.050	3.704	3.829	0.076	0.144	0.144	0.033	0.034
Standby Generator	D	0.003	0.006	0.003	0.001	0.001	0.115	0.218	0.115	0.030	0.030	0.001	0.002	0.001	0.000	0.000
CONTRACTOR EQUIPMENT																
Casing Tong	D															
Cementing Unit #1	D															
Cementing Unit #2	D															
Haliburton Unit #1	D	0.019					0.242					0.016				
Haliburton Unit #2	D	0.019					0.242					0.016				
Log/Wireline Unit	D															
TOTAL		1.213	1.826	1.704	0.495	0.506	32.673	54.885	52.687	13.426	13.821	2.354	2.223	0.727	0.251	0.254

Platform: ELLEN (con't)

EQUIPMENT	FUEL TYPE	CO Emissions (tons) 1986	1987	1988	1989	1990	TSP Emissions (tons) 1986	1987	1988	1989	1990	Annual Average THC	NOx	SO2	CO	TSP
Crane #1 (east)	D	0.518	0.564	0.481	0.248	0.250	0.170	0.185	0.158	0.081	0.082	0.152	1.895	0.126	0.412	0.135
Crane #2 (center)	D	0.518	0.564	0.481	0.248	0.250	0.170	0.185	0.158	0.081	0.082	0.152	1.895	0.126	0.412	0.135
Escape Capsule	D	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.001	0.000
Flare (10-100)	NG	0.461	0.375				0.066	0.054				0.069	1.673	1.610	0.418	0.060
Rig Generator #1	D	2.207	4.158	4.173	0.963	0.996	0.849	1.599	1.605	0.370	0.383	0.269	9.612	0.087	2.499	0.961
Rig Generator #2	D	2.207	4.158	4.173	0.963	0.996	0.849	1.599	1.605	0.370	0.383	0.269	9.612	0.087	2.499	0.961
Rig Generator #3	D	2.207	4.158	4.173	0.963	0.996	0.849	1.599	1.605	0.370	0.383	0.269	9.612	0.087	2.499	0.961
Standby Generator	D	0.030	0.057	0.030	0.008	0.008	0.012	0.022	0.011	0.003	0.003	0.003	0.101	0.001	0.026	0.010
CONTRACTOR EQUIPMENT																
Casing Tong	D															
Cementing Unit #1	D															
Cementing Unit #2	D															
Haliburton Unit #1	D	0.053					0.017					0.019	0.242	0.016	0.053	0.017
Haliburton Unit #2	D	0.053					0.017					0.019	0.242	0.016	0.053	0.017
Log/Wireline Unit	D															
TOTAL		8.255	14.035	13.512	3.394	3.497	2.999	5.243	5.142	1.275	1.316	1.222	34.889	2.155	8.873	3.259

Platform: ELLY

Date: 10/12/90

ESTIMATED ANNUAL EMISSION RATES

EQUIPMENT	FUEL TYPE	THC Emissions (tons)					NOx Emissions (tons)					SO2 Emissions (tons)				
		1986	1987	1988	1989	1990	1986	1987	1988	1989	1990	1986	1987	1988	1989	1990
Crane #1 (east)	D	0.044	0.053	0.043	0.026	0.028	0.555	0.659	0.541	0.324	0.352	0.037	0.044	0.036	0.022	0.023
Crane #2 (west)	D	0.044	0.053	0.043	0.026	0.028	0.555	0.659	0.541	0.324	0.352	0.037	0.044	0.036	0.022	0.023
Emerg Gen #1	D	0.023	0.024	0.024	0.024	0.024	0.288	0.304	0.305	0.304	0.305	0.019	0.020	0.020	0.020	0.020
Emerg Gen #2 (MARS)	D	0.001	0.001	0.001	0.004	0.005	0.012	0.014	0.014	0.049	0.056	0.001	0.001	0.001	0.003	0.004
Escape Capsule	D	0.000	0.000	0.000	0.005	0.005	0.001	0.001	0.001	0.060	0.059	0.000	0.000	0.000	0.004	0.004
Flare	NG	0.056	0.063	0.052	0.051	0.051	1.358	1.512	1.246	1.239	1.239	1.779	1.981	1.632	1.623	1.623
Gas Compressor (K04)	NG	0.312	0.061				4.067	0.795				2.486	0.486			
Standby Gen	D			0.003	0.002	0.002			0.113	0.065	0.075			0.000	0.000	0.000
Turbine #1 (P07A)	NG	0.844	0.964	1.083	0.947	1.050	8.301	9.478	10.650	9.314	10.325	2.058	2.349	2.640	2.308	2.559
Turbine #1 (P07A)	D	0.017	0.034	0.254	0.165	0.168	0.206	0.413	3.074	1.996	2.034	0.001	0.002	0.013	0.008	0.009
Turbine #2 (P10A)	NG	0.876	0.768	0.504	1.159	1.260	8.614	7.553	4.959	11.394	12.390	2.135	1.872	1.229	2.824	3.071
Turbine #2 (P10A)	D	0.013	0.030	0.107	0.314	0.280	0.156	0.358	1.301	3.798	3.390	0.001	0.002	0.005	0.016	0.014
Turbine #3 (P10B)	NG	0.985	1.159	1.007	0.676	0.735	9.686	11.393	9.902	6.644	7.228	2.401	2.824	2.454	1.647	1.791
Turbine #3 (P10B)	D	0.027	0.077	0.246	0.138	0.140	0.333	0.937	2.981	1.674	1.695	0.001	0.004	0.013	0.007	0.007
Turbine #4 (J01A)	NG	1.640	0.556	0.337	4.424	4.200	16.128	5.469	3.313	43.504	41.300	3.997	1.356	0.821	10.783	10.237
Turbine #4 (J01A)	D	0.005	0.098	0.180	0.213	0.210	0.058	1.182	2.174	2.577	2.543	0.000	0.005	0.009	0.011	0.011
Turbine #5 (J01B)	NG	1.080	0.460	0.633	1.889	1.680	10.615	4.527	6.223	18.575	16.520	2.631	1.122	1.543	4.604	4.095
Turbine #5 (J01B)	D	0.007	0.117	0.087	0.242	0.224	0.079	1.414	1.054	2.928	2.712	0.000	0.006	0.004	0.012	0.011
Turbine #6 (J01C)	NG	1.940	0.203	0.592	0.616	0.630	19.074	1.995	5.818	6.053	6.195	4.728	0.494	1.442	1.500	1.535
Turbine #6 (J01C)	D	0.010	0.022	0.105	0.232	0.168	0.124	0.270	1.272	2.811	2.034	0.001	0.001	0.005	0.012	0.009
Turbine #7 J01D MARS	NG	9.296	9.092	8.832	11.023	11.025	91.414	89.408	86.845	108.390	108.413	22.658	22.161	21.525	26.865	26.871
Turbine #7 J01D MARS	D	0.047	0.430	0.065	0.050	0.056	0.569	5.209	0.784	0.609	0.678	0.002	0.022	0.003	0.003	0.003
Turbine #8 J01E MARS	NG	8.720	9.777	10.431	7.072	7.350	85.746	96.144	102.576	69.544	72.275	21.253	23.830	25.424	17.237	17.914
Turbine #8 J01E MARS	D	0.045	0.361	0.065	0.254	0.266	0.546	4.375	0.782	3.076	3.221	0.002	0.018	0.003	0.013	0.014
TOTAL		26.032	24.403	24.694	29.552	29.585	258.485	244.069	246.469	295.252	295.391	66.228	58.644	58.858	69.544	69.848

Platform: ELLY (con't)

EQUIPMENT	FUEL TYPE	CO Emissions (tons) 1986	1987	1988	1989	1990	TSP Emissions (tons) 1986	1987	1988	1989	1990	Annual Average THC	NOx	SO2	CO	TSP
Crane #1 (east)	D	0.121	0.143	0.118	0.070	0.077	0.040	0.047	0.039	0.023	0.025	0.039	0.486	0.032	0.106	0.035
Crane #2 (west)	D	0.121	0.143	0.118	0.070	0.077	0.040	0.047	0.039	0.023	0.025	0.039	0.486	0.032	0.106	0.035
Emerg Gen #1	D	0.063	0.066	0.066	0.066	0.066	0.021	0.022	0.022	0.022	0.022	0.024	0.301	0.020	0.066	0.022
Emerg Gen #2 (MARS)	D	0.003	0.003	0.003	0.011	0.012	0.001	0.001	0.001	0.004	0.004	0.002	0.029	0.002	0.006	0.002
Escape Capsule	D	0.000	0.000	0.000	0.013	0.013	0.000	0.000	0.000	0.004	0.004	0.002	0.024	0.002	0.005	0.002
Flare	NG	0.340	0.378	0.311	0.310	0.310	0.049	0.054	0.045	0.044	0.044	0.055	1.319	1.728	0.330	0.047
Gas Compressor (K04)	NG	1.627	0.318				0.190	0.037				0.186	2.431	1.486	0.972	0.113
Standby Gen	D			0.029	0.017	0.020			0.011	0.007	0.008	0.002	0.084	0.000	0.022	0.008
Turbine #1 (P07A)	NG	2.311	2.639	2.966	2.593	2.875	0.281	0.321	0.361	0.316	0.350	0.978	9.614	2.383	2.677	0.326
Turbine #1 (P07A)	D	0.047	0.094	0.698	0.453	0.462	0.015	0.030	0.227	0.147	0.150	0.128	1.545	0.007	0.351	0.114
Turbine #2 (P10A)	NG	2.399	2.103	1.381	3.173	3.450	0.292	0.256	0.168	0.386	0.420	0.913	8.982	2.226	2.501	0.304
Turbine #2 (P10A)	D	0.036	0.081	0.296	0.863	0.770	0.012	0.026	0.096	0.280	0.250	0.149	1.801	0.008	0.409	0.133
Turbine #3 (P10B)	NG	2.697	3.172	2.757	1.850	2.013	0.328	0.386	0.336	0.225	0.245	0.912	8.970	2.223	2.498	0.304
Turbine #3 (P10B)	D	0.076	0.213	0.677	0.380	0.385	0.025	0.069	0.220	0.123	0.125	0.126	1.524	0.006	0.346	0.112
Turbine #4 (J01A)	NG	4.491	1.523	0.923	12.114	11.500	0.547	0.185	0.112	1.475	1.400	2.231	21.943	5.439	6.110	0.744
Turbine #4 (J01A)	D	0.013	0.268	0.494	0.585	0.578	0.004	0.087	0.160	0.190	0.188	0.141	1.707	0.007	0.388	0.126
Turbine #5 (J01B)	NG	2.956	1.261	1.733	5.172	4.600	0.360	0.153	0.211	0.630	0.560	1.148	11.292	2.799	3.144	0.383
Turbine #5 (J01B)	D	0.018	0.321	0.239	0.665	0.616	0.006	0.104	0.078	0.216	0.200	0.135	1.637	0.007	0.372	0.121
Turbine #6 (J01C)	NG	5.311	0.555	1.620	1.685	1.725	0.647	0.068	0.197	0.205	0.210	0.796	7.827	1.940	2.179	0.265
Turbine #6 (J01C)	D	0.028	0.061	0.289	0.638	0.462	0.009	0.020	0.094	0.207	0.150	0.108	1.302	0.005	0.296	0.096
Turbine #7 J01D MARS	NG	25.454	24.896	24.182	30.181	30.188	3.099	3.031	2.944	3.674	3.675	9.854	96.894	24.016	26.980	3.285
Turbine #7 J01D MARS	D	0.129	1.183	0.178	0.138	0.154	0.042	0.384	0.058	0.045	0.050	0.130	1.570	0.007	0.357	0.116
Turbine #8 J01E MARS	NG	23.876	26.771	28.562	19.364	20.125	2.907	3.259	3.477	2.357	2.450	8.670	85.257	21.132	23.740	2.890
Turbine #8 J01E MARS	D	0.124	0.994	0.178	0.699	0.732	0.040	0.323	0.058	0.227	0.238	0.198	2.400	0.010	0.545	0.177
TOTAL		72.241	67.186	67.818	81.110	81.210	8.955	8.910	8.954	10.830	10.793	26.966	269.424	65.517	74.505	9.759

Platform: EUREKA

Date: 10/12/90

ESTIMATED ANNUAL EMISSION RATES

EQUIPMENT	FUEL TYPE	THC Emissions (tons) 1986	1987	1988	1989	1990	NOx Emissions (tons) 1986	1987	1988	1989	1990	SO2 Emissions (tons) 1986	1987	1988	1989	1990
Crane #1 (East)	D	0.077	0.055	0.032	0.028	0.028	0.957	0.685	0.403	0.349	0.352	0.064	0.046	0.027	0.023	0.023
Crane #2 (West)	D	0.077	0.055	0.032	0.028	0.028	0.957	0.685	0.403	0.349	0.352	0.064	0.046	0.027	0.023	0.023
Crane #3 (Center)	D	0.077	0.055	0.032	0.028	0.028	0.957	0.685	0.403	0.349	0.352	0.064	0.046	0.027	0.023	0.023
Emergency Gen #1	D	0.006	0.067	0.020	0.006	0.006	0.230	2.397	0.709	0.209	0.200	0.002	0.022	0.006	0.002	0.002
Emergency Gen #2	D	0.003	0.010	0.003	0.003	0.002	0.033	0.129	0.041	0.035	0.023	0.002	0.009	0.003	0.002	0.002
Escape Capsule #1	D	0.001	0.000	0.000	0.000	0.000	0.008	0.002	0.003	0.001	0.001	0.001	0.000	0.000	0.000	0.000
Escape Capsule #2	D	0.001	0.000	0.000	0.000	0.000	0.008	0.002	0.003	0.001	0.001	0.001	0.000	0.000	0.000	0.000
Escape Capsule #3	D	0.001	0.000	0.000	0.000	0.000	0.008	0.002	0.003	0.001	0.001	0.001	0.000	0.000	0.000	0.000
Flare (10-100)	NG	0.019	0.020	0.002	0.004		0.459	0.474	0.050	0.088		0.441	0.456	0.048	0.084	
Rig Generator #1	D	0.590	0.559	0.176	0.016		21.057	19.966	6.297	0.560		0.190	0.180	0.057	0.005	
Rig Generator #2	D	0.590	0.559	0.176	0.016		21.057	19.966	6.297	0.560		0.190	0.180	0.057	0.005	
Rig Generator #3	D	0.590	0.559	0.176	0.016		21.057	19.966	6.297	0.560		0.190	0.180	0.057	0.005	
Utility Pump	D	0.102	0.342	0.101	0.068		1.278	4.282	1.269	0.856		0.085	0.285	0.084	0.057	
CONTRACTOR EQUIPMENT																
CGS Tng Unit	D	0.004					0.052					0.003				
Halliburton Unit #1	D	0.186	0.168	0.001			2.326	2.096	0.014			0.155	0.139	0.001		
Halliburton Unit #2	D	0.186		0.001			2.326		0.014			0.155		0.001		
Log/Wireline Unit	D	0.020	0.009				0.245	0.108				0.016	0.007			
TOTAL		2.530	2.458	0.752	0.213	0.092	73.015	71.445	22.206	3.918	1.282	1.624	1.596	0.395	0.229	0.073

Platform: EUREKA (con't)

EQUIPMENT	FUEL TYPE	CO Emissions (tons) 1986	1987	1988	1989	1990	TSP Emissions (tons) 1986	1987	1988	1989	1990	Annual Average THC	NOx	SO2	CO	TSP
Crane #1 (East)	D	0.208	0.149	0.088	0.076	0.077	0.068	0.049	0.029	0.025	0.025	0.044	0.549	0.037	0.119	0.039
Crane #2 (West)	D	0.208	0.149	0.088	0.076	0.077	0.068	0.049	0.029	0.025	0.025	0.044	0.549	0.037	0.119	0.039
Crane #3 (Center)	D	0.208	0.149	0.088	0.076	0.077	0.068	0.049	0.029	0.025	0.025	0.044	0.549	0.037	0.119	0.039
Emergency Gen #1	D	0.060	0.623	0.184	0.054	0.052	0.023	0.240	0.071	0.021	0.020	0.021	0.749	0.007	0.195	0.075
Emergency Gen #2	D	0.007	0.028	0.009	0.008	0.005	0.002	0.009	0.003	0.002	0.002	0.004	0.052	0.003	0.011	0.004
Escape Capsule #1	D	0.002	0.001	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.001	0.000
Escape Capsule #2	D	0.002	0.001	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.001	0.000
Escape Capsule #3	D	0.002	0.001	0.001	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.001	0.000
Flare (10-100)	NG	0.115	0.119	0.013	0.022		0.016	0.017	0.002	0.003		0.011	0.268	0.257	0.067	0.010
Rig Generator #1	D	5.475	5.191	1.637	0.146		2.106	1.997	0.630	0.056		0.335	11.970	0.108	3.112	1.197
Rig Generator #2	D	5.475	5.191	1.637	0.146		2.106	1.997	0.630	0.056		0.335	11.970	0.108	3.112	1.197
Rig Generator #3	D	5.475	5.191	1.637	0.146		2.106	1.997	0.630	0.056		0.335	11.970	0.108	3.112	1.197
Utility Pump	D	0.278	0.931	0.276	0.186		0.091	0.306	0.091	0.061		0.154	1.921	0.128	0.418	0.137
CONTRACTOR EQUIPMENT																
CGS Tng Unit	D	0.011					0.004					0.004	0.052	0.003	0.011	0.004
Halliburton Unit #1	D	0.506	0.456	0.003			0.166	0.150	0.001			0.118	1.479	0.098	0.322	0.106
Halliburton Unit #2	D	0.506		0.003			0.166		0.001			0.094	1.170	0.078	0.254	0.084
Log/Wireline Unit	D	0.053	0.023				0.017	0.008				0.014	0.176	0.012	0.038	0.013
TOTAL		18.591	18.203	5.666	0.936	0.288	7.010	6.868	2.146	0.330	0.097	1.558	43.434	1.020	11.013	4.140

Platform: GAIL

Date: 11/27/90

ESTIMATED ANNUAL EMISSION RATES

EQUIPMENT	FUEL TYPE	THC Emissions (tons) 1986	1987	1988	1989	1990	NOx Emissions (tons) 1986	1987	1988	1989	1990	SO2 Emissions (tons) 1986	1987	1988	1989	1990
Air Compressor	D			0.001	0.002	0.002			0.011	0.023	0.023			0.001	0.002	0.002
Crane #1 (north)	D				0.117	0.117				1.464	1.464				0.097	0.097
Crane #2 (south)	D				0.284	0.284				3.547	3.547				0.236	0.236
Drilling Stndby Gen	D															
Firewater Pump	D			0.004	0.021	0.021			0.052	0.266	0.266			0.003	0.018	0.018
Flare (10-100)	NG			0.016	0.130	0.130			0.395	3.141	3.141			0.119	0.945	0.945
Life Capsule #1	D															
Life Capsule #2	D															
Life Capsule #3	D															
Oil Spill Power Pack	D															
Standby Gen.	D			0.006	0.043	0.043			0.214	1.536	1.536			0.003	0.023	0.023
Turbine #1 (G-01)	NG				7.696	7.696				6.981	6.981				1.324	1.324
Turbine #1 (G-01)	D			0.159	0.404	0.404			0.339	0.861	0.861			0.117	0.296	0.296
Turbine #2 (G-02)	NG				7.696	7.696				6.981	6.981				1.324	1.324
Turbine #2 (G-02)	D			0.159	0.404	0.404			0.339	0.861	0.861			0.117	0.296	0.296
Turbine #3	NG				7.696	7.696				6.981	6.981				1.324	1.324
Turbine #3	D			0.159	0.404	0.404			0.339	0.861	0.861			0.117	0.296	0.296
Turbine Starter #1	D															
Turbine Starter #2	D															
Turbine Starter #3	D															
CONTRACTOR EQUIPMENT																
Logging Unit	D															
Wire Line Unit	D															
TOTAL				0.504	24.897	24.897			1.689	33.503	33.503			0.477	6.181	6.181

Platform: GAIL (con't)

EQUIPMENT	FUEL TYPE	CO Emissions (tons) 1986	1987	1988	1989	1990	TSP Emissions (tons) 1986	1987	1988	1989	1990	Annual Average THC	NOx	SO2	CO	TSP
Air Compressor	D			0.002	0.005	0.005			0.001	0.002	0.002	0.002	0.019	0.001	0.004	0.001
Crane #1 (north)	D				0.319	0.319				0.105	0.105	0.117	1.464	0.097	0.319	0.105
Crane #2 (south)	D				0.771	0.771				0.253	0.253	0.284	3.547	0.236	0.771	0.253
Drilling Stndby Gen	D															
Firewater Pump	D			0.011	0.058	0.058			0.004	0.019	0.019	0.016	0.194	0.013	0.042	0.014
Flare (10-100)	NG			0.099	0.785	0.785			0.014	0.112	0.112	0.092	2.226	0.669	0.557	0.080
Life Capsule #1	D															
Life Capsule #2	D															
Life Capsule #3	D															
Oil Spill Power Pack	D															
Standby Gen.	D			0.056	0.399	0.399			0.021	0.154	0.154	0.031	1.095	0.016	0.285	0.110
Turbine #1 (G-01)	NG				6.479	6.479				0.789	0.789	7.696	6.981	1.324	6.479	0.789
Turbine #1 (G-01)	D			0.257	0.652	0.652			0.083	0.212	0.212	0.322	0.687	0.236	0.520	0.169
Turbine #2 (G-02)	NG				6.479	6.479				0.789	0.789	7.696	6.981	1.324	6.479	0.789
Turbine #2 (G-02)	D			0.257	0.652	0.652			0.083	0.212	0.212	0.322	0.687	0.236	0.520	0.169
Turbine #3	NG				6.479	6.479				0.789	0.789	7.696	6.981	1.324	6.479	0.789
Turbine #3	D			0.257	0.652	0.652			0.083	0.212	0.212	0.322	0.687	0.236	0.520	0.169
Turbine Starter #1	D															
Turbine Starter #2	D															
Turbine Starter #3	D															
CONTRACTOR EQUIPMENT																
Logging Unit	D															
Wire Line Unit	D															
TOTAL				0.939	23.730	23.730			0.289	3.648	3.648	24.594	31.550	5.715	22.976	3.435

Platform: GILDA

Date: 10/12/90

ESTIMATED ANNUAL EMISSION RATES

EQUIPMENT	FUEL TYPE	THC Emissions (tons) 1986	1987	1988	1989	1990	NOx Emissions (tons) 1986	1987	1988	1989	1990	SO2 Emissions (tons) 1986	1987	1988	1989	1990
Crane #1	D	0.308	0.140	0.324	0.308	0.319	3.858	1.757	4.047	3.855	3.987	0.257	0.117	0.269	0.256	0.265
Crane #2	D	0.308	0.140	0.324	0.308	0.319	3.858	1.757	4.047	3.855	3.987	0.257	0.117	0.269	0.256	0.265
Emergency Gen #1	D	0.010	0.012	0.009	0.002	0.007	0.120	0.147	0.114	0.029	0.082	0.008	0.010	0.008	0.002	0.005
Emergency Gen #2	D				0.003	0.024				0.036	0.305				0.002	0.020
Flare (10-100)	NG	0.187	0.142	0.126	0.087	0.131	4.508	3.416	3.036	2.110	3.150	0.108	0.082	0.073	0.051	0.076
Heater Unit	NG				0.069	0.070				1.655	1.680				0.040	0.040
CONTRACTOR EQUIPMENT																
Cementing Unit	D	0.023	0.056	0.029	0.035	0.035	0.813	1.986	1.048	1.241	1.250	0.012	0.030	0.016	0.019	0.019
TOTAL		0.836	0.490	0.812	0.812	0.905	13.157	9.063	12.292	12.781	14.441	0.642	0.356	0.635	0.626	0.690

EQUIPMENT	FUEL TYPE	CO Emissions (tons) 1986	1987	1988	1989	1990	TSP Emissions (tons) 1986	1987	1988	1989	1990	Annual Average THC	NOx	SO2	CO	TSP
Crane #1	D	0.839	0.382	0.880	0.838	0.867	0.276	0.126	0.289	0.275	0.285	0.280	3.501	0.233	0.761	0.250
Crane #2	D	0.839	0.382	0.880	0.838	0.867	0.276	0.126	0.289	0.275	0.285	0.280	3.501	0.233	0.761	0.250
Emergency Gen #1	D	0.026	0.032	0.025	0.006	0.018	0.009	0.011	0.008	0.002	0.006	0.008	0.098	0.007	0.021	0.007
Emergency Gen #2	D				0.008	0.066				0.003	0.022	0.014	0.170	0.011	0.037	0.012
Flare (10-100)	NG	1.127	0.854	0.759	0.528	0.788	0.161	0.122	0.108	0.075	0.113	0.134	3.244	0.078	0.811	0.116
Heater Unit	NG				0.414	0.420				0.059	0.060	0.069	1.667	0.040	0.417	0.060
CONTRACTOR EQUIPMENT																
Cementing Unit	D	0.211	0.516	0.272	0.323	0.325	0.081	0.199	0.105	0.124	0.125	0.035	1.267	0.019	0.330	0.127
TOTAL		3.042	2.166	2.816	2.955	3.351	0.803	0.584	0.799	0.813	0.896	0.820	13.449	0.621	3.138	0.821

Platform: GINA

Date: 10/12/90

ESTIMATED ANNUAL EMISSION RATES

EQUIPMENT	FUEL TYPE	THC Emissions (tons) 1986	1987	1988	1989	1990	NOx Emissions (tons) 1986	1987	1988	1989	1990	SO2 Emissions (tons) 1986	1987	1988	1989	1990
Crane	D	0.005	0.008	0.029	0.101	0.038	0.067	0.095	0.367	1.263	0.469	0.004	0.006	0.024	0.084	0.031
Emergency Generator	D	0.015	0.008	0.007	0.048	0.019	0.183	0.106	0.089	0.603	0.235	0.012	0.007	0.006	0.040	0.016
Vent	NG			408.158	6.141	345.000										
CONTRACTOR EQUIPMENT																
Cement Unit	D			0.010					0.121					0.008		
TOTAL		0.020	0.016	408.204	6.290	345.057	0.250	0.201	0.577	1.866	0.704	0.016	0.013	0.038	0.124	0.047

EQUIPMENT	FUEL TYPE	CO Emissions (tons) 1986	1987	1988	1989	1990	TSP Emissions (tons) 1986	1987	1988	1989	1990	Annual Average THC	NOx	SO2	CO	TSP
Crane	D	0.015	0.021	0.080	0.275	0.102	0.005	0.007	0.026	0.090	0.034	0.036	0.452	0.030	0.098	0.032
Emergency Generator	D	0.040	0.023	0.019	0.131	0.051	0.013	0.008	0.006	0.043	0.017	0.019	0.243	0.016	0.053	0.017
Vent	NG											253.100				
CONTRACTOR EQUIPMENT																
Cement Unit	D			0.026					0.009			0.010	0.121	0.008	0.026	0.009
TOTAL		0.055	0.044	0.125	0.406	0.153	0.018	0.015	0.041	0.133	0.051	253.165	0.817	0.054	0.178	0.058

Platform: GRACE

Date: 10/12/90

ESTIMATED ANNUAL EMISSION RATES

EQUIPMENT	FUEL TYPE	THC Emissions (tons) 1986	1987	1988	1989	1990	NOx Emissions (tons) 1986	1987	1988	1989	1990	SO2 Emissions (tons) 1986	1987	1988	1989	1990
Boom Boat	D															
Compressor--Standby	D															
Compressor--Standby	D															
Compressor-BrthngAir	D															
Crane #1	D	0.010	0.014	0.014	0.014	0.014	0.127	0.169	0.169	0.169	0.169	0.008	0.011	0.011	0.011	0.011
Crane #2	D	0.010	0.014	0.014	0.014	0.014	0.127	0.169	0.169	0.169	0.169	0.008	0.011	0.011	0.011	0.011
Firewater Pump	D	0.003	0.005	0.005	0.005	0.005	0.042	0.056	0.056	0.056	0.056	0.003	0.004	0.004	0.004	0.004
Flare (10-100)	NG	0.007	0.005	0.006	0.007	0.007	0.159	0.131	0.152	0.166	0.166	0.048	0.039	0.046	0.050	0.050
Life Capsule #1	D															
Life Capsule #2	D															
Life Capsule #3	D															
Standby Gen	D	0.003	0.005	0.005	0.005	0.005	0.042	0.056	0.056	0.056	0.056	0.003	0.004	0.004	0.004	0.004
Turbine #1	NG	1.862	4.221	2.026	1.797	1.797	18.313	41.510	19.925	17.668	17.668	1.042	2.362	1.134	1.005	1.005
Turbine #1	D	0.094	0.182	0.163	0.091	0.091	1.136	2.200	1.974	1.105	1.105	0.120	0.232	0.208	0.117	0.117
Turbine #2	NG	1.862	4.221	2.026	1.797	1.797	18.313	41.510	19.925	17.668	17.668	1.042	2.362	1.134	1.005	1.005
Turbine #2	D	0.094	0.182	0.163	0.091	0.091	1.136	2.200	1.974	1.105	1.105	0.120	0.232	0.208	0.117	0.117
Turbine #3	NG	1.862	4.221	2.026	1.797	1.797	18.313	41.510	19.925	17.668	17.668	1.042	2.362	1.134	1.005	1.005
Turbine #3	D	0.094	0.182	0.163	0.091	0.091	1.136	2.200	1.974	1.105	1.105	0.120	0.232	0.208	0.117	0.117
CONTRACTOR EQUIPMENT																
Barnacle Removal Com	D															
Gold State Wire Line	D															
Haliburton Acid Pmpn	D															
Haliburton Acidizing	D															
Haliburton Pump #1	D															
Haliburton Pumps	D															
TOTAL		5.901	13.252	6.611	5.709	5.709	58.844	131.711	66.299	56.935	56.935	3.556	7.851	4.102	3.446	3.446

Platform: GRACE (con't)

EQUIPMENT	FUEL TYPE	CO Emissions (tons) 1986	1987	1988	1989	1990	TSP Emissions (tons) 1986	1987	1988	1989	1990	Annual Average THC	NOx	SO2	CO	TSP
Boom Boat	D															
Compressor--Standby	D															
Compressor--Standby	D															
Compressor-BrthngAir	D															
Crane #1	D	0.028	0.037	0.037	0.037	0.037	0.009	0.012	0.012	0.012	0.012	0.013	0.160	0.011	0.035	0.011
Crane #2	D	0.028	0.037	0.037	0.037	0.037	0.009	0.012	0.012	0.012	0.012	0.013	0.160	0.011	0.035	0.011
Firewater Pump	D	0.009	0.012	0.012	0.012	0.012	0.003	0.004	0.004	0.004	0.004	0.004	0.053	0.004	0.012	0.004
Flare (10-100)	NG	0.040	0.033	0.038	0.041	0.041	0.006	0.005	0.005	0.006	0.006	0.006	0.155	0.047	0.039	0.006
Life Capsule #1	D															
Life Capsule #2	D															
Life Capsule #3	D															
Standby Gen	D	0.009	0.012	0.012	0.012	0.012	0.003	0.004	0.004	0.004	0.004	0.004	0.053	0.004	0.012	0.004
Turbine #1	NG	5.099	11.559	5.548	4.920	4.920	0.621	1.407	0.675	0.599	0.599	2.341	23.017	1.310	6.409	0.780
Turbine #1	D	0.258	0.500	0.448	0.251	0.251	0.084	0.162	0.146	0.082	0.082	0.124	1.504	0.159	0.342	0.111
Turbine #2	NG	5.099	11.559	5.548	4.920	4.920	0.621	1.407	0.675	0.599	0.599	2.341	23.017	1.310	6.409	0.780
Turbine #2	D	0.258	0.500	0.448	0.251	0.251	0.084	0.162	0.146	0.082	0.082	0.124	1.504	0.159	0.342	0.111
Turbine #3	NG	5.099	11.559	5.548	4.920	4.920	0.621	1.407	0.675	0.599	0.599	2.341	23.017	1.310	6.409	0.780
Turbine #3	D	0.258	0.500	0.448	0.251	0.251	0.084	0.162	0.146	0.082	0.082	0.124	1.504	0.159	0.342	0.111
CONTRACTOR EQUIPMENT																
Barnacle Removal Com	D															
Gold State Wire Line	D															
Haliburton Acid Pmpn	D															
Haliburton Acidizing	D															
Haliburton Pump #1	D															
Haliburton Pumps	D															
TOTAL		16.185	36.308	18.124	15.652	15.652	2.145	4.744	2.500	2.081	2.081	7.435	74.145	4.480	20.384	2.710

Platform: HABITAT

Date: 10/12/90

ESTIMATED ANNUAL EMISSION RATES

EQUIPMENT	FUEL TYPE	THC Emissions (tons) 1986	1987	1988	1989	1990	NOx Emissions (tons) 1986	1987	1988	1989	1990	SO2 Emissions (tons) 1986	1987	1988	1989	1990
Crane #1	D	0.039	0.028	0.049	0.071	0.047	0.482	0.351	0.610	0.886	0.586	0.032	0.023	0.041	0.059	0.039
Crane #2	D	0.056	0.030	0.203	0.127	0.104	0.698	0.372	2.538	1.588	1.301	0.046	0.025	0.169	0.106	0.087
Emerg/Texaco Gen	D	0.023	0.015	0.014	0.007	0.014	0.284	0.183	0.169	0.089	0.181	0.019	0.012	0.011	0.006	0.012
Gas Comp Engine	NG			0.175	0.443	0.483			0.228	0.578	0.630					
Glycol Reboiler	NG	0.018	0.019	0.018	0.017	0.018	0.222	0.231	0.222	0.217	0.223					
Vent	NG	20.056	59.186	557.969	189.748	206.796										
CONTRACTOR EQUIPMENT																
CSG Power Tongs	D	0.003					0.035					0.002				
Cementing Unit #1	D	0.001		0.014	0.003	0.013	0.019		0.169	0.033	0.160	0.001		0.011	0.002	0.011
Cementing Unit #2	D	0.001		0.014	0.003	0.013	0.019		0.169	0.033	0.160	0.001		0.011	0.002	0.011
Cementing Unit #3	D	0.001		0.009	0.002	0.008	0.012		0.107	0.023	0.101	0.001		0.007	0.002	0.007
Draw Works #1	D			0.479	0.045				5.986	0.560				0.398	0.037	
Draw Works #2	D			0.479	0.045				5.986	0.560				0.398	0.037	
OSCA Filter System	D			0.028		0.014			0.346		0.176			0.023		0.012
Otis Nitro	D			0.001	0.006	0.004			0.007	0.078	0.047			0.000	0.005	0.003
Pool Mud Pump	D			0.042	0.001				1.503	0.025				0.023	0.000	
Pool Standby Gen	D			0.008	0.002	0.006			0.101	0.030	0.075			0.007	0.002	0.005
Sand Blstrs	D			0.001					0.015					0.001		
Standby/Aux Gen	D	0.005					0.183					0.003				
Welding Generator	D				0.035					0.434					0.029	
Welding Unit #1	D		0.002	0.002	0.003	0.002		0.030	0.022	0.037	0.029		0.002	0.001	0.002	0.002
Welding Unit #2	D		0.002	0.002	0.003	0.002		0.030	0.022	0.037	0.029		0.002	0.001	0.002	0.002
Welding Unit #3	D		0.002	0.002	0.003	0.002		0.030	0.022	0.037	0.029		0.002	0.001	0.002	0.002
Welding Unit #4	D		0.002	0.002	0.003	0.002		0.030	0.022	0.037	0.029		0.002	0.001	0.002	0.002
Welding Unit #5	D		0.002	0.002	0.001	0.002		0.029	0.022	0.014	0.023		0.002	0.001	0.001	0.002
Welding Unit #6	D			0.002		0.001			0.022		0.007			0.001		0.000
Wireline Unit #1	D	0.010	0.003	0.017	0.004	0.004	0.121	0.041	0.210	0.055	0.054	0.008	0.003	0.014	0.004	0.004
Wireline Unit #2	D			0.007					0.088					0.006		
Wireline Unit #3	D			0.002	0.000	0.001			0.021	0.004	0.014			0.001	0.000	0.001
Wireline Unit #4	D			0.001					0.007					0.000		
Wireline Unit #5	D				0.001	0.001				0.008	0.007				0.001	0.000
Wireline Unit #6	D			0.001					0.012					0.001		
Wireline Unit #7	D				0.000	0.000				0.005	0.005				0.000	0.000
Wireline Unit #8	D					0.003					0.035					0.002
TOTAL		20.213	59.291	559.543	190.573	207.540	2.075	1.327	18.626	5.368	3.901	0.113	0.073	1.128	0.301	0.204

Platform: HABITAT (con't)

EQUIPMENT	FUEL TYPE	CO Emissions (tons) 1986	1987	1988	1989	1990	TSP Emissions (tons) 1986	1987	1988	1989	1990	Annual Average THC	NOx	SO2	CO	TSP
Crane #1	D	0.105	0.076	0.133	0.193	0.128	0.034	0.025	0.044	0.063	0.042	0.047	0.583	0.039	0.127	0.042
Crane #2	D	0.152	0.081	0.552	0.345	0.283	0.050	0.027	0.181	0.113	0.093	0.104	1.300	0.086	0.283	0.093
Emerg/Texaco Gen	D	0.062	0.040	0.037	0.019	0.039	0.020	0.013	0.012	0.006	0.013	0.014	0.181	0.012	0.039	0.013
Gas Comp Engine	NG			0.911	2.310	2.520			0.106	0.270	0.294	0.367	0.478		1.914	0.223
Glycol Reboiler	NG	0.044	0.046	0.044	0.043	0.045	0.011	0.012	0.011	0.011	0.011	0.018	0.223		0.045	0.011
Vent	NG											206.751				
CONTRACTOR EQUIPMENT																
CSG Power Tongs	D	0.008					0.003					0.003	0.035	0.002	0.008	0.003
Cementing Unit #1	D	0.004		0.037	0.007	0.035	0.001		0.012	0.002	0.011	0.008	0.095	0.006	0.021	0.007
Cementing Unit #2	D	0.004		0.037	0.007	0.035	0.001		0.012	0.002	0.011	0.008	0.095	0.006	0.021	0.007
Cementing Unit #3	D	0.003		0.023	0.005	0.022	0.001		0.008	0.002	0.007	0.005	0.061	0.004	0.013	0.004
Draw Works #1	D			1.302	0.122				0.428	0.040		0.262	3.273	0.218	0.712	0.234
Draw Works #2	D			1.302	0.122				0.428	0.040		0.262	3.273	0.218	0.712	0.234
OSCA Filter System	D			0.075		0.038			0.025		0.013	0.021	0.261	0.017	0.057	0.019
Otis Nitro	D			0.002	0.017	0.010			0.001	0.006	0.003	0.004	0.044	0.003	0.010	0.003
Pool Mud Pump	D			0.391	0.007				0.150	0.003		0.021	0.764	0.011	0.199	0.076
Pool Standby Gen	D			0.022	0.007	0.016			0.007	0.002	0.005	0.006	0.069	0.005	0.015	0.005
Sand Bistrs	D			0.003					0.001			0.001	0.015	0.001	0.003	0.001
Standby/Aux Gen	D	0.047					0.018					0.005	0.183	0.003	0.047	0.018
Welding Generator	D				0.094					0.031		0.035	0.434	0.029	0.094	0.031
Welding Unit #1	D		0.007	0.005	0.008	0.006		0.002	0.002	0.003	0.002	0.002	0.030	0.002	0.006	0.002
Welding Unit #2	D		0.007	0.005	0.008	0.006		0.002	0.002	0.003	0.002	0.002	0.030	0.002	0.006	0.002
Welding Unit #3	D		0.007	0.005	0.008	0.006		0.002	0.002	0.003	0.002	0.002	0.030	0.002	0.006	0.002
Welding Unit #4	D		0.007	0.005	0.008	0.006		0.002	0.002	0.003	0.002	0.002	0.030	0.002	0.006	0.002
Welding Unit #5	D		0.006	0.005	0.003	0.005		0.002	0.002	0.001	0.002	0.002	0.022	0.001	0.005	0.002
Welding Unit #6	D			0.005		0.002			0.002		0.001	0.001	0.015	0.001	0.003	0.001
Wireline Unit #1	D	0.026	0.009	0.046	0.012	0.012	0.009	0.003	0.015	0.004	0.004	0.008	0.096	0.006	0.021	0.007
Wireline Unit #2	D			0.019					0.006			0.007	0.088	0.006	0.019	0.006
Wireline Unit #3	D			0.005	0.001	0.003			0.002	0.000	0.001	0.001	0.013	0.001	0.003	0.001
Wireline Unit #4	D			0.002					0.001			0.001	0.007	0.000	0.002	0.001
Wireline Unit #5	D				0.002	0.002				0.001	0.001	0.001	0.008	0.001	0.002	0.001
Wireline Unit #6	D			0.003					0.001			0.001	0.012	0.001	0.003	0.001
Wireline Unit #7	D				0.001	0.001				0.000	0.000	0.000	0.005	0.000	0.001	0.000
Wireline Unit #8	D					0.008					0.003	0.003	0.035	0.002	0.008	0.003
TOTAL		0.455	0.286	4.976	3.349	3.228	0.148	0.090	1.463	0.609	0.523	207.973	11.786	0.689	4.409	1.053

Platform: HARVEST

Date: 10/12/90

ESTIMATED ANNUAL EMISSION RATES

EQUIPMENT	FUEL TYPE	THC Emissions (tons) 1986	1987	1988	1989	1990	NOx Emissions (tons) 1986	1987	1988	1989	1990	SO2 Emissions (tons) 1986	1987	1988	1989	1990
Crane #1	D	0.019	0.374	0.156	0.110	0.094	0.242	4.683	1.956	1.372	1.173	0.016	0.312	0.130	0.091	0.078
Crane #2	D	0.019	0.374	0.109	0.074	0.073	0.242	4.683	1.359	0.932	0.915	0.016	0.312	0.090	0.062	0.061
Crane #3	D	0.012	0.228	0.095	0.067	0.066	0.148	2.857	1.193	0.837	0.821	0.010	0.190	0.079	0.056	0.055
Firewater Pump #1	D	0.000	0.005	0.006	0.005	0.005	0.006	0.067	0.072	0.066	0.059	0.000	0.004	0.005	0.004	0.004
Firewater Pump #2	D	0.000	0.005	0.006	0.005	0.005	0.006	0.067	0.072	0.066	0.059	0.000	0.004	0.005	0.004	0.004
Flare (0-10)	NG		0.260	0.020				3.251	0.244				82.133	6.165		
Otis Nitr/Tbg #1	D					0.013					0.164					0.011
Texaco/Stndby Gen #1	D	0.000	0.003	0.012	0.021	0.021	0.001	0.213	0.867	1.483	1.475	0.000	0.003	0.013	0.022	0.022
Texaco/Stndby Gen #2	D	0.000	0.003	0.011	0.021	0.021	0.001	0.231	0.807	1.486	1.475	0.000	0.003	0.012	0.022	0.022
Turbine Gas Comp #1	NG															
Turbine Gas Comp #2	NG															
Turbine Gas Comp #3	NG															
Turbine Gen #1	NG			0.471					0.705					4.865		
Turbine Gen #1	D	0.267	1.842	1.663	0.867	0.859	0.616	4.241	3.830	1.996	1.977	0.200	1.380	1.246	0.650	0.644
Turbine Gen #2	NG			0.757		0.751			1.132		1.124			7.811		7.755
Turbine Gen #2	D	0.264	2.400	1.590	0.454	0.453	0.608	5.527	3.661	1.045	1.044	0.198	1.799	1.192	0.340	0.340
Turbine Gen #3	NG			0.471					0.705					4.865		
Turbine Gen #3	D	0.143	3.469	1.172	2.024	2.022	0.328	7.990	2.699	4.661	4.658	0.107	2.600	0.878	1.517	1.516
Turbine Gen #4	NG			0.540					0.807					5.570		
Turbine Gen #4	D	0.574	3.967	1.860	2.170	2.166	1.322	9.135	4.284	4.997	4.987	0.430	2.973	1.394	1.626	1.623
Turbine Gen #5	NG			0.232					0.348					2.397		
Turbine Gen #5	D	0.356	3.552	0.378	1.354	1.350	0.819	8.180	0.870	3.119	3.109	0.267	2.662	0.283	1.015	1.012
CONTRACTOR EQUIPMENT																
Cement Pump #1	D	0.002	0.039	0.009	0.009	0.008	0.031	0.487	0.116	0.116	0.094	0.002	0.032	0.008	0.008	0.006
Cement Pump #2	D	0.001	0.016	0.009	0.009	0.008	0.013	0.202	0.116	0.116	0.094	0.001	0.013	0.008	0.008	0.006
H & P Gen (Drl Rig G	D	0.008	0.017	0.011	0.011	0.011	0.303	0.604	0.379	0.379	0.375	0.005	0.009	0.006	0.006	0.006
H & P Gen (Drl Rig G	D	0.008	0.017	0.011	0.011	0.011	0.303	0.604	0.379	0.379	0.375	0.005	0.009	0.006	0.006	0.006
Logging Unit	D															
Temp Air Comp #1	D	0.015					0.184					0.012				
Temp Air Comp #2	D	0.015					0.184					0.012				
Temp Air Comp #3	D	0.004					0.044					0.003				
Tong Svc/Nitrogen	D															
TOTAL		1.707	16.571	9.589	7.212	7.937	5.401	53.022	26.601	23.050	23.978	1.284	94.438	37.028	5.437	13.171

Platform: HARVEST (con't)

EQUIPMENT	FUEL TYPE	CO Emissions (tons) 1986	1987	1988	1989	1990	TSP Emissions (tons) 1986	1987	1988	1989	1990	Annual Average THC	NOx	SO2	CO	TSP
Crane #1	D	0.053	1.019	0.425	0.298	0.255	0.017	0.335	0.140	0.098	0.084	0.151	1.885	0.125	0.410	0.135
Crane #2	D	0.053	1.019	0.295	0.203	0.199	0.017	0.335	0.097	0.067	0.065	0.130	1.626	0.108	0.354	0.116
Crane #3	D	0.032	0.621	0.259	0.182	0.179	0.011	0.204	0.085	0.060	0.059	0.094	1.171	0.078	0.255	0.084
Firewater Pump #1	D	0.001	0.015	0.016	0.014	0.013	0.000	0.005	0.005	0.005	0.004	0.004	0.054	0.004	0.012	0.004
Firewater Pump #2	D	0.001	0.015	0.016	0.014	0.013	0.000	0.005	0.005	0.005	0.004	0.004	0.054	0.004	0.012	0.004
Flare (0-10)	NG		0.650	0.049				0.163	0.012			0.140	1.748	44.149	0.350	0.087
Otis Nitr/Tbg #1	D					0.036					0.012	0.013	0.164	0.011	0.036	0.012
Texaco/Stndby Gen #1	D	0.000	0.028	0.113	0.193	0.192	0.000	0.021	0.087	0.148	0.148	0.011	0.807	0.012	0.105	0.081
Texaco/Stndby Gen #2	D	0.000	0.030	0.105	0.193	0.192	0.000	0.023	0.081	0.149	0.148	0.011	0.800	0.012	0.104	0.080
Turbine Gas Comp #1	NG															
Turbine Gas Comp #2	NG															
Turbine Gas Comp #3	NG															
Turbine Gen #1	NG			0.397					0.048			0.471	0.705	4.865	0.397	0.048
Turbine Gen #1	D	0.432	2.973	2.685	1.399	1.386	0.140	0.965	0.872	0.454	0.450	1.099	2.532	0.824	1.775	0.576
Turbine Gen #2	NG			0.637		0.633			0.078		0.077	0.754	1.128	7.783	0.635	0.077
Turbine Gen #2	D	0.426	3.874	2.566	0.732	0.732	0.138	1.258	0.833	0.238	0.238	1.032	2.377	0.774	1.666	0.541
Turbine Gen #3	NG			0.397					0.048			0.471	0.705	4.865	0.397	0.048
Turbine Gen #3	D	0.230	5.600	1.892	3.267	3.265	0.075	1.818	0.614	1.061	1.060	1.766	4.067	1.324	2.851	0.926
Turbine Gen #4	NG			0.454					0.055			0.540	0.807	5.570	0.454	0.055
Turbine Gen #4	D	0.927	6.403	3.003	3.503	3.496	0.301	2.079	0.975	1.137	1.135	2.147	4.945	1.609	3.466	1.125
Turbine Gen #5	NG			0.196					0.024			0.232	0.348	2.397	0.196	0.024
Turbine Gen #5	D	0.574	5.733	0.610	2.186	2.179	0.186	1.862	0.198	0.710	0.708	1.398	3.219	1.048	2.257	0.733
CONTRACTOR EQUIPMENT																
Cement Pump #1	D	0.007	0.106	0.025	0.025	0.020	0.002	0.035	0.008	0.008	0.007	0.013	0.169	0.011	0.037	0.012
Cement Pump #2	D	0.003	0.044	0.025	0.025	0.020	0.001	0.014	0.008	0.008	0.007	0.009	0.108	0.007	0.024	0.008
H & P Gen (Drl Rig G	D	0.079	0.157	0.098	0.098	0.098	0.030	0.060	0.038	0.038	0.038	0.011	0.408	0.006	0.106	0.041
H & P Gen (Drl Rig G	D	0.079	0.157	0.098	0.098	0.098	0.030	0.060	0.038	0.038	0.038	0.011	0.408	0.006	0.106	0.041
Logging Unit	D											0.015	0.184	0.012	0.040	0.013
Temp Air Comp #1	D	0.040					0.013					0.015	0.184	0.012	0.040	0.013
Temp Air Comp #2	D	0.040					0.013					0.004	0.044	0.003	0.010	0.003
Temp Air Comp #3	D	0.010					0.003									
Tong Svc/Nitrogen	D															
TOTAL		2.987	28.444	14.361	12.430	13.006	0.977	9.242	4.349	4.224	4.282	10.548	30.649	75.618	16.091	4.887

Platform: HENRY

Date: 10/12/90

ESTIMATED ANNUAL EMISSION RATES

EQUIPMENT	FUEL TYPE	THC Emissions (tons) 1986	1987	1988	1989	1990	NOx Emissions (tons) 1986	1987	1988	1989	1990	SO2 Emissions (tons) 1986	1987	1988	1989	1990
Crane #1	D	0.083	0.042	0.040	0.022	0.022	1.037	0.530	0.496	0.280	0.280	0.069	0.035	0.033	0.019	0.019
Crane #2	D	0.021	0.011	0.013	0.007	0.007	0.257	0.131	0.165	0.093	0.093	0.017	0.009	0.011	0.006	0.006
Emergency Gen	D	0.000	0.000	0.000	0.000	0.000	0.003	0.003	0.003	0.003	0.003	0.000	0.000	0.000	0.000	0.000
Firewater Pump	D	0.000	0.000	0.000	0.000	0.000	0.003	0.003	0.003	0.003	0.003	0.000	0.000	0.000	0.000	0.000
Turbine Comp #1	NG	0.311					4.054					0.007				
Turbine Comp #2	NG	0.402					5.246					0.009				
Turbine Generator	NG	5.523	5.457	3.719	5.433	5.433	54.310	53.665	36.567	53.420	53.420	0.037	0.037	0.025	0.036	0.036
Vent	NG	273.280	119.420	24.612	10.360	10.360										
TOTAL		279.620	124.930	28.384	15.822	15.822	64.910	54.332	37.234	53.799	53.799	0.139	0.081	0.069	0.061	0.061

EQUIPMENT	FUEL TYPE	CO Emissions (tons) 1986	1987	1988	1989	1990	TSP Emissions (tons) 1986	1987	1988	1989	1990	Annual Average THC	NOx	SO2	CO	TSP
Crane #1	D	0.226	0.115	0.108	0.061	0.061	0.074	0.038	0.035	0.020	0.020	0.042	0.525	0.035	0.114	0.037
Crane #2	D	0.056	0.029	0.036	0.020	0.020	0.018	0.009	0.012	0.007	0.007	0.012	0.148	0.010	0.032	0.011
Emergency Gen	D	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.001	0.000
Firewater Pump	D	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.001	0.000
Turbine Comp #1	NG	1.622					0.189					0.311	4.054	0.007	1.622	0.189
Turbine Comp #2	NG	2.098					0.245					0.402	5.246	0.009	2.098	0.245
Turbine Generator	NG	15.123	14.943	10.182	14.875	14.875	1.841	1.819	1.240	1.811	1.811	5.113	50.276	0.034	13.999	1.704
Vent	NG											87.606				
TOTAL		19.127	15.089	10.328	14.958	14.958	2.367	1.866	1.287	1.838	1.838	93.486	60.255	0.095	17.867	2.187

Platform: HERMOSA

Date: 10/12/90

ESTIMATED ANNUAL EMISSION RATES

EQUIPMENT	FUEL TYPE	THC Emissions (tons)					NOx Emissions (tons)					SO2 Emissions (tons)				
		1986	1987	1988	1989	1990	1986	1987	1988	1989	1990	1986	1987	1988	1989	1990
Air Compressor #1	D				0.000	0.000				0.000	0.000				0.000	0.000
Air Compressor #2	D				0.000	0.000				0.000	0.000				0.000	0.000
Crane #1 (west)	D		0.177	0.093	0.040	0.040		1.772	0.930	0.398	0.398		0.147	0.077	0.033	0.033
Crane #2 (east)	D		0.177	0.093	0.040	0.040		1.772	0.930	0.398	0.398		0.147	0.077	0.033	0.033
Diesel Pump	D															
Drilling Standby Gen	D															
Firewater Pump	D		0.007	0.007	0.007	0.007		0.087	0.082	0.090	0.090		0.006	0.005	0.006	0.006
Flare (10-100)	NG		0.029	0.009	0.012	0.012		0.688	0.214	0.280	0.280		0.207	0.064	0.084	0.084
Life Capsule #1	D															
Life Capsule #2	D															
Life Capsule #3	D															
Standby Gen #1	D		0.014	0.109	0.024	0.024		0.427	3.351	0.740	0.740		0.064	0.503	0.111	0.111
Turbine #1	NG				0.372	0.372				0.422	0.422				0.080	0.080
Turbine #1	D		3.766	2.330	1.912	1.912		5.291	3.273	2.685	2.685		1.821	1.126	0.924	0.924
Turbine #2	NG				0.372	0.372				0.422	0.422				0.080	0.080
Turbine #2	D		3.766	2.330	1.912	1.912		5.291	3.273	2.685	2.685		1.821	1.126	0.924	0.924
Turbine #3	NG				0.372	0.372				0.422	0.422				0.080	0.080
Turbine #3	D		3.766	2.330	1.912	1.912		5.291	3.273	2.685	2.685		1.821	1.126	0.924	0.924
Turbine #4	NG				0.372	0.372				0.422	0.422				0.080	0.080
Turbine #4	D		3.766	2.330	1.912	1.912		5.291	3.273	2.685	2.685		1.821	1.126	0.924	0.924
CONTRACTOR EQUIPMENT																
Drilling Gen #1	D		0.027					0.337					0.022			
TOTAL			15.495	9.631	9.259	9.259		26.247	18.599	14.334	14.334		7.877	5.230	4.283	4.283

Platform: HERMOSA (con't)

EQUIPMENT	FUEL TYPE	CO Emissions (tons) 1986	1987	1988	1989	1990	TSP Emissions (tons) 1986	1987	1988	1989	1990	Annual Average THC	NOx	SO2	CO	TSP
Air Compressor #1	D				0.000	0.000				0.000	0.000	0.000	0.000	0.000	0.000	0.000
Air Compressor #2	D				0.000	0.000				0.000	0.000	0.000	0.000	0.000	0.000	0.000
Crane #1 (west)	D		0.482	0.253	0.108	0.108		0.158	0.083	0.036	0.036	0.087	0.875	0.073	0.238	0.078
Crane #2 (east)	D		0.482	0.253	0.108	0.108		0.158	0.083	0.036	0.036	0.087	0.875	0.073	0.238	0.078
Diesel Pump	D															
Drilling Standby Gen	D															
Firewater Pump	D		0.019	0.018	0.020	0.020		0.006	0.006	0.006	0.006	0.007	0.087	0.006	0.019	0.006
Flare (10-100)	NG		0.172	0.053	0.070	0.070		0.025	0.008	0.010	0.010	0.015	0.365	0.110	0.091	0.013
Life Capsule #1	D															
Life Capsule #2	D															
Life Capsule #3	D															
Standby Gen #1	D		0.139	1.089	0.241	0.241		0.053	0.419	0.093	0.093	0.043	1.314	0.197	0.427	0.164
Turbine #1	NG				0.392	0.392				0.048	0.048	0.372	0.422	0.080	0.392	0.048
Turbine #1	D		4.006	2.478	2.033	2.033		1.301	0.804	0.660	0.660	2.480	3.483	1.199	2.637	0.856
Turbine #2	NG				0.392	0.392				0.048	0.048	0.372	0.422	0.080	0.392	0.048
Turbine #2	D		4.006	2.478	2.033	2.033		1.301	0.804	0.660	0.660	2.480	3.483	1.199	2.637	0.856
Turbine #3	NG				0.392	0.392				0.048	0.048	0.372	0.422	0.080	0.392	0.048
Turbine #3	D		4.006	2.478	2.033	2.033		1.301	0.804	0.660	0.660	2.480	3.483	1.199	2.637	0.856
Turbine #4	NG				0.392	0.392				0.048	0.048	0.372	0.422	0.080	0.392	0.048
Turbine #4	D		4.006	2.478	2.033	2.033		1.301	0.804	0.660	0.660	2.480	3.483	1.199	2.637	0.856
CONTRACTOR EQUIPMENT																
Drilling Gen #1	D		0.073					0.024				0.027	0.337	0.022	0.073	0.024
TOTAL			17.391	11.578	10.247	10.247		5.628	3.815	3.013	3.013	11.673	19.476	5.596	13.202	3.980

Platform: HIDALGO

Date: 10/12/90

ESTIMATED ANNUAL EMISSION RATES

EQUIPMENT	FUEL TYPE	THC Emissions (tons) 1986	1987	1988	1989	1990	NOx Emissions (tons) 1986	1987	1988	1989	1990	SO2 Emissions (tons) 1986	1987	1988	1989	1990
Crane #1 (west)	D		0.085	0.136	0.045	0.045		0.849	1.362	0.451	0.451		0.071	0.113	0.038	0.038
Crane #2 (east)	D		0.085	0.136	0.045	0.045		0.849	1.362	0.451	0.451		0.071	0.113	0.038	0.038
Diesel Pump	D															
Drilling Standby Gen	D															
Firewater Pump	D			0.003	0.010	0.010			0.044	0.129	0.129			0.003	0.009	0.009
Flare (<10)	NG			0.012	0.025	0.025			0.147	0.313	0.313			0.062	0.132	0.132
Life Capsule #1	D															
Life Capsule #2	D															
Life Capsule #3	D															
Open Rescue Boat	D															
Standby Generator	D		0.100	0.018	0.016	0.016		3.078	0.548	0.502	0.502		0.462	0.082	0.075	0.075
Turbine #1	NG				0.846	0.846				0.960	0.960				0.182	0.182
Turbine #1	D		1.253	1.960	1.735	1.727		1.760	2.753	2.437	2.426		0.606	0.947	0.839	0.835
Turbine #2	NG				0.846	0.846				0.960	0.960				0.182	0.182
Turbine #2	D		1.253	1.960	1.735	1.735		1.760	2.753	2.437	2.437		0.606	0.947	0.839	0.839
Turbine #3	NG				0.846	0.846				0.960	0.960				0.182	0.182
Turbine #3	D		1.253	1.960	1.735	1.735		1.760	2.753	2.437	2.437		0.606	0.947	0.839	0.839
Turbine #4	NG				0.846	0.846				0.960	0.960				0.182	0.182
Turbine #4	D		1.253	1.960	1.735	1.735		1.760	2.753	2.437	2.437		0.606	0.947	0.839	0.839
Turbine Starter #1	D															
Turbine Starter #2	D															
Turbine Starter #3	D															
CONTRACTOR EQUIPMENT																
Rental Generator	D		0.116					1.453					0.097			
Welding Unit	D		0.087					1.092					0.073			
TOTAL			5.485	8.145	10.465	10.457		14.361	14.475	15.434	15.423		3.198	4.161	4.376	4.372

Platform: HIDALGO (con't)

EQUIPMENT	FUEL TYPE	CO Emissions (tons) 1986	1987	1988	1989	1990	TSP Emissions (tons) 1986	1987	1988	1989	1990	Annual Average THC	NOx	SO2	CO	TSP
Crane #1 (west)	D		0.231	0.370	0.123	0.123		0.076	0.122	0.040	0.040	0.078	0.778	0.065	0.212	0.070
Crane #2 (east)	D		0.231	0.370	0.123	0.123		0.076	0.122	0.040	0.040	0.078	0.778	0.065	0.212	0.070
Diesel Pump	D															
Drilling Standby Gen	D															
Firewater Pump	D			0.009	0.028	0.028			0.003	0.009	0.009	0.008	0.100	0.007	0.022	0.007
Flare (<10)	NG			0.029	0.063	0.063			0.007	0.016	0.016	0.021	0.258	0.109	0.052	0.013
Life Capsule #1	D															
Life Capsule #2	D															
Life Capsule #3	D															
Open Rescue Boat	D															
Standby Generator	D		1.000	0.178	0.163	0.163		0.385	0.069	0.063	0.063	0.038	1.158	0.174	0.376	0.145
Turbine #1	NG				0.891	0.891				0.109	0.109	0.846	0.960	0.182	0.891	0.109
Turbine #1	D		1.333	2.084	1.845	1.837		0.433	0.677	0.599	0.596	1.669	2.344	0.807	1.775	0.576
Turbine #2	NG				0.891	0.891				0.109	0.109	0.846	0.960	0.182	0.891	0.109
Turbine #2	D		1.333	2.084	1.845	1.845		0.433	0.677	0.599	0.599	1.671	2.347	0.808	1.777	0.577
Turbine #3	NG				0.891	0.891				0.109	0.109	0.846	0.960	0.182	0.891	0.109
Turbine #3	D		1.333	2.084	1.845	1.845		0.433	0.677	0.599	0.599	1.671	2.347	0.808	1.777	0.577
Turbine #4	NG				0.891	0.891				0.109	0.109	0.846	0.960	0.182	0.891	0.109
Turbine #4	D		1.333	2.084	1.845	1.845		0.433	0.677	0.599	0.599	1.671	2.347	0.808	1.777	0.577
Turbine Starter #1	D															
Turbine Starter #2	D															
Turbine Starter #3	D															
CONTRACTOR EQUIPMENT																
Rental Generator	D		0.316					0.104				0.116	1.453	0.097	0.316	0.104
Welding Unit	D		0.238					0.078				0.087	1.092	0.073	0.238	0.078
TOTAL			7.348	9.292	11.444	11.436		2.451	3.031	3.000	2.997	10.491	18.843	4.546	12.097	3.226

Platform: HILLHOUSE

Date: 10/12/90

ESTIMATED ANNUAL EMISSION RATES

EQUIPMENT	FUEL TYPE	THC Emissions (tons) 1986	1987	1988	1989	1990	NOx Emissions (tons) 1986	1987	1988	1989	1990	SO2 Emissions (tons) 1986	1987	1988	1989	1990
Crane #1	D	0.003	0.003	0.004	0.004	0.004	0.041	0.042	0.055	0.055	0.055	0.003	0.003	0.004	0.004	0.004
Crane #2	D	0.007	0.007	0.006	0.006	0.006	0.083	0.085	0.072	0.072	0.072	0.006	0.006	0.005	0.005	0.005
Emergency Gen #1	D	0.017	0.017	0.017	0.006	0.006	0.600	0.600	0.600	0.218	0.218	0.086	0.086	0.086	0.031	0.031
Emergency Gen #2	D	0.017	0.017	0.017	0.006	0.006	0.600	0.600	0.600	0.218	0.218	0.086	0.086	0.086	0.031	0.031
Firewater Pump	D	0.000	0.000	0.000	0.000	0.000	0.003	0.003	0.003	0.003	0.003	0.000	0.000	0.000	0.000	0.000
Gas Turbine #1	NG	1.722	1.321	1.208	1.027	1.027	16.933	12.994	11.880	10.102	10.102	0.008	0.006	0.005	0.005	0.005
Gas Turbine #2	NG	1.722	1.321	1.208	1.027	1.027	16.933	12.994	11.880	10.102	10.102	0.008	0.006	0.005	0.005	0.005
Turbine Comp #1	NG	0.943	0.654	0.547	0.580	0.580	12.300	8.531	7.130	7.559	7.559	0.014	0.010	0.008	0.008	0.008
Turbine Comp #2	NG	0.943	0.654	0.547	0.580	0.580	12.300	8.531	7.130	7.559	7.559	0.014	0.010	0.008	0.008	0.008
Vent	NG	655.980	414.845	79.054	116.261	116.261										
TOTAL		661.354	418.839	82.608	119.497	119.497	59.793	44.380	39.350	35.888	35.888	0.225	0.213	0.207	0.097	0.097

EQUIPMENT	FUEL TYPE	CO Emissions (tons) 1986	1987	1988	1989	1990	TSP Emissions (tons) 1986	1987	1988	1989	1990	Annual Average THC	NOx	SO2	CO	TSP
Crane #1	D	0.009	0.009	0.012	0.012	0.012	0.003	0.003	0.004	0.004	0.004	0.004	0.050	0.003	0.011	0.004
Crane #2	D	0.018	0.018	0.016	0.016	0.016	0.006	0.006	0.005	0.005	0.005	0.006	0.077	0.005	0.017	0.005
Emergency Gen #1	D	0.156	0.156	0.156	0.057	0.057	0.060	0.060	0.060	0.022	0.022	0.013	0.447	0.064	0.116	0.045
Emergency Gen #2	D	0.156	0.156	0.156	0.057	0.057	0.060	0.060	0.060	0.022	0.022	0.013	0.447	0.064	0.116	0.045
Firewater Pump	D	0.001	0.001	0.001	0.001	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.001	0.000
Gas Turbine #1	NG	4.715	3.618	3.308	2.813	2.813	0.574	0.440	0.403	0.342	0.342	1.261	12.402	0.006	3.453	0.420
Gas Turbine #2	NG	4.715	3.618	3.308	2.813	2.813	0.574	0.440	0.403	0.342	0.342	1.261	12.402	0.006	3.453	0.420
Turbine Comp #1	NG	4.920	3.413	2.852	3.024	3.024	0.574	0.398	0.333	0.353	0.353	0.661	8.616	0.010	3.446	0.402
Turbine Comp #2	NG	4.920	3.413	2.852	3.024	3.024	0.574	0.398	0.333	0.353	0.353	0.661	8.616	0.010	3.446	0.402
Vent	NG											276.480				
TOTAL		19.610	14.402	12.661	11.817	11.817	2.425	1.805	1.601	1.443	1.443	280.359	43.059	0.168	14.060	1.744

Platform: HOGAN

Date: 10/12/90

ESTIMATED ANNUAL EMISSION RATES

EQUIPMENT	FUEL TYPE	THC Emissions (tons) 1986	1987	1988	1989	1990	NOx Emissions (tons) 1986	1987	1988	1989	1990	SO2 Emissions (tons) 1986	1987	1988	1989	1990
Crane #1	D	0.005	0.003	0.003	0.009		0.059	0.042	0.037	0.111		0.004	0.003	0.002	0.007	
Crane #2	D	0.003	0.002	0.002	0.006		0.037	0.027	0.023	0.069		0.002	0.002	0.002	0.005	
Emergency Generator	D	0.004	0.004	0.005	0.012		0.050	0.051	0.058	0.144		0.003	0.003	0.004	0.010	
Firewater Pump	D	0.003	0.003	0.003	0.009		0.037	0.037	0.037	0.115		0.002	0.002	0.002	0.008	
Vent	NG	3.078	13.728													
CONTRACTOR EQUIPMENT																
Mud Pump	D					0.019					0.235					0.016
Pulling Unit	D					0.131					1.642					0.109
Rotary Table	D					0.019					0.235					0.016
TOTAL		3.093	13.740	0.013	0.036	0.169	0.183	0.157	0.155	0.439	2.112	0.011	0.010	0.010	0.030	0.141

EQUIPMENT	FUEL TYPE	CO Emissions (tons) 1986	1987	1988	1989	1990	TSP Emissions (tons) 1986	1987	1988	1989	1990	Annual Average THC	NOx	SO2	CO	TSP
Crane #1	D	0.013	0.009	0.008	0.024		0.004	0.003	0.003	0.008		0.005	0.062	0.004	0.014	0.004
Crane #2	D	0.008	0.006	0.005	0.015		0.003	0.002	0.002	0.005		0.003	0.039	0.003	0.008	0.003
Emergency Generator	D	0.011	0.011	0.013	0.031		0.004	0.004	0.004	0.010		0.006	0.076	0.005	0.017	0.005
Firewater Pump	D	0.008	0.008	0.008	0.025		0.003	0.003	0.003	0.008		0.005	0.057	0.004	0.012	0.004
Vent	NG											8.403				
CONTRACTOR EQUIPMENT																
Mud Pump	D					0.051					0.017	0.019	0.235	0.016	0.051	0.017
Pulling Unit	D					0.357					0.117	0.131	1.642	0.109	0.357	0.117
Rotary Table	D					0.051					0.017	0.019	0.235	0.016	0.051	0.017
TOTAL		0.040	0.034	0.034	0.095	0.459	0.014	0.012	0.012	0.031	0.151	8.590	2.344	0.156	0.510	0.167

Platform: HONDO

Date: 10/12/90

ESTIMATED ANNUAL EMISSION RATES

EQUIPMENT	FUEL TYPE	THC Emissions (tons) 1986	1987	1988	1989	1990	NOx Emissions (tons) 1986	1987	1988	1989	1990	SO2 Emissions (tons) 1986	1987	1988	1989	1990
Crane #1	D3	0.260	0.228	0.435	0.302		3.253	2.846	5.441	3.777		0.216	0.189	0.362	0.251	
Crane #2	D3	0.260	0.228	0.435	0.302		3.253	2.846	5.441	3.777		0.216	0.189	0.362	0.251	
Emergency Generator	D23		0.007		0.112			0.044		0.687			0.002		0.012	
Firewater Pump #1	D12	0.115	0.042	0.029	0.017		1.437	0.519	0.364	0.209		0.096	0.035	0.024	0.014	
Firewater Pump #2	D12	0.115	0.042	0.029	0.017		1.437	0.519	0.364	0.209		0.096	0.035	0.024	0.014	
Flare HP	NG3	0.268	0.220	0.181	0.157		3.347	2.752	2.267	1.968		53.544	44.032	36.268	31.482	
Flare LP	NG2	0.056	0.052	0.050	0.050		0.696	0.650	0.630	0.628		11.722	10.947	10.609	10.579	
Turbine #1	NG	0.145	0.016				3.569	0.384								
Turbine #1	D	0.030	0.003				0.410	0.045				0.057	0.011			
Turbine #2	NG	0.145	0.016				3.569	0.384								
Turbine #2	D	0.030	0.003				0.410	0.045				0.057	0.011			
Turbine #3	NG	0.145	0.016				3.569	0.384								
Turbine #3	D	0.030	0.003				0.410	0.045				0.057	0.011			
CONTRACTOR EQUIPMENT																
Cementing Unit (#1 E	D3				0.019					0.235					0.016	
Cementing Unit (#2 E	D3				0.019					0.235					0.016	
Cementing Unit (#3 E	D23		0.009	0.019				0.117	0.235				0.008	0.016		
Drilling Generator	D23		0.508	0.249	0.249			3.131	1.532	1.532			0.111	0.027	0.027	
TOTAL		1.599	1.393	1.427	1.244		25.360	14.711	16.274	13.257		66.061	55.581	47.692	42.662	

Platform: HONDO (con't)

EQUIPMENT	FUEL TYPE	CO Emissions (tons) 1986	1987	1988	1989	1990	TSP Emissions (tons) 1986	1987	1988	1989	1990	Annual Average THC	NOx	SO2	CO	TSP
Crane #1	D3	0.707	0.619	1.183	0.821		0.232	0.203	0.389	0.270		0.306	3.829	0.255	0.833	0.274
Crane #2	D3	0.707	0.619	1.183	0.821		0.232	0.203	0.389	0.270		0.306	3.829	0.255	0.833	0.274
Emergency Generator	D23		0.005		0.082			0.004		0.063		0.059	0.366	0.007	0.044	0.034
Firewater Pump #1	D12	0.313	0.113	0.079	0.045		0.103	0.037	0.026	0.015		0.051	0.632	0.042	0.138	0.045
Firewater Pump #2	D12	0.313	0.113	0.079	0.045		0.103	0.037	0.026	0.015		0.051	0.632	0.042	0.138	0.045
Flare HP	NG3	0.669	0.550	0.453	0.394		0.167	0.138	0.113	0.098		0.207	2.583	41.332	0.517	0.129
Flare LP	NG2	0.139	0.130	0.126	0.126		0.035	0.033	0.032	0.031		0.052	0.651	10.964	0.130	0.033
Turbine #1	NG	2.832	0.305				0.161	0.017				0.080	1.977		1.568	0.089
Turbine #1	D	0.425	0.047				0.040	0.004				0.017	0.228	0.034	0.236	0.022
Turbine #2	NG	2.832	0.305				0.161	0.017				0.080	1.977		1.568	0.089
Turbine #2	D	0.425	0.047				0.040	0.004				0.017	0.228	0.034	0.236	0.022
Turbine #3	NG	2.832	0.305				0.161	0.017				0.080	1.977		1.568	0.089
Turbine #3	D	0.425	0.047				0.040	0.004				0.017	0.228	0.034	0.236	0.022
CONTRACTOR EQUIPMENT																
Cementing Unit (#1 E	D3				0.051					0.017		0.019	0.235	0.016	0.051	0.017
Cementing Unit (#2 E	D3				0.051					0.017		0.019	0.235	0.016	0.051	0.017
Cementing Unit (#3 E	D23		0.026	0.051				0.008	0.017			0.014	0.176	0.012	0.038	0.013
Drilling Generator	D23		0.376	0.184	0.184			0.288	0.141	0.141		0.335	2.065	0.055	0.248	0.190
TOTAL		12.619	3.607	3.338	2.620		1.475	1.014	1.133	0.937		1.709	21.845	53.098	8.433	1.404

Platform: HOUCHIN

Date: 10/12/90

ESTIMATED ANNUAL EMISSION RATES

EQUIPMENT	FUEL TYPE	THC Emissions (tons) 1986	1987	1988	1989	1990	NOx Emissions (tons) 1986	1987	1988	1989	1990	SO2 Emissions (tons) 1986	1987	1988	1989	1990
Crane #1	D	0.050	0.021	0.030	0.020		0.625	0.266	0.373	0.252		0.042	0.018	0.025	0.017	
Crane #2	D	0.031	0.013	0.019	0.013		0.390	0.166	0.232	0.157		0.026	0.011	0.015	0.010	
Emergency Generator	D	0.004	0.004	0.006	0.004		0.049	0.044	0.073	0.053		0.003	0.003	0.005	0.004	
Firewater Pump	D	0.003	0.003	0.003	0.003		0.038	0.035	0.034	0.041		0.003	0.002	0.002	0.003	
Vent	NG	3.078	13.728													
CONTRACTOR EQUIPMENT																
Mud Pump	D	0.009	0.019	0.019	0.019	0.019	0.117	0.235	0.235	0.235	0.235	0.008	0.016	0.016	0.016	0.016
Pulling Unit	D	0.056	0.131	0.131	0.131	0.131	0.704	1.642	1.642	1.642	1.642	0.047	0.109	0.109	0.109	0.109
Rotary Table	D	0.009	0.019	0.019	0.019	0.019	0.117	0.235	0.235	0.235	0.235	0.008	0.016	0.016	0.016	0.016
TOTAL		3.240	13.938	0.227	0.209	0.169	2.040	2.623	2.824	2.615	2.112	0.137	0.175	0.188	0.175	0.141

EQUIPMENT	FUEL TYPE	CO Emissions (tons) 1986	1987	1988	1989	1990	TSP Emissions (tons) 1986	1987	1988	1989	1990	Annual Average THC	NOx	SO2	CO	TSP
Crane #1	D	0.136	0.058	0.081	0.055		0.045	0.019	0.027	0.018		0.030	0.379	0.025	0.082	0.027
Crane #2	D	0.085	0.036	0.050	0.034		0.028	0.012	0.017	0.011		0.019	0.236	0.016	0.051	0.017
Emergency Generator	D	0.011	0.010	0.016	0.012		0.004	0.003	0.005	0.004		0.004	0.055	0.004	0.012	0.004
Firewater Pump	D	0.008	0.008	0.008	0.009		0.003	0.002	0.002	0.003		0.003	0.037	0.002	0.008	0.003
Vent	NG											8.403				
CONTRACTOR EQUIPMENT																
Mud Pump	D	0.026	0.051	0.051	0.051	0.051	0.008	0.017	0.017	0.017	0.017	0.017	0.211	0.014	0.046	0.015
Pulling Unit	D	0.153	0.357	0.357	0.357	0.357	0.050	0.117	0.117	0.117	0.117	0.116	1.454	0.097	0.316	0.104
Rotary Table	D	0.026	0.051	0.051	0.051	0.051	0.008	0.017	0.017	0.017	0.017	0.017	0.211	0.014	0.046	0.015
TOTAL		0.445	0.571	0.614	0.569	0.459	0.146	0.187	0.202	0.187	0.151	8.609	2.583	0.172	0.562	0.185

Date: 10/12/90

Platform: IRENE

ESTIMATED ANNUAL EMISSION RATES

EQUIPMENT	FUEL TYPE	THC Emissions (tons) 1986	1987	1988	1989	1990	NOx Emissions (tons) 1986	1987	1988	1989	1990	SO2 Emissions (tons) 1986	1987	1988	1989	1990
Crane #1	D	0.012	0.008	0.007	0.010	0.009	0.149	0.103	0.084	0.121	0.117	0.010	0.007	0.006	0.008	0.008
Crane #2	D	0.028	0.027	0.010	0.039	0.038	0.347	0.340	0.125	0.484	0.469	0.023	0.023	0.008	0.032	0.031
Emergency Gen #1	D	0.012	0.001	0.005	0.004	0.004	0.149	0.016	0.064	0.048	0.047	0.010	0.001	0.004	0.003	0.003
Emergency Gen #2	D	0.026	0.014	0.005	0.014	0.015	0.915	0.496	0.194	0.512	0.525	0.014	0.007	0.003	0.008	0.008
Emergency Gen #3	D	0.026	0.014	0.005	0.014	0.015	0.915	0.496	0.194	0.513	0.525	0.014	0.007	0.003	0.008	0.008
Flare (10-100)	NG		0.009	0.016	0.029	0.029		0.210	0.398	0.696	0.700		0.144	0.394	0.556	0.560
Flare Pilot and Purg	NG	0.001	0.001	0.001	0.001	0.001	0.027	0.027	0.027	0.027	0.027	0.027	0.018	0.026	0.021	0.021
TOTAL		0.105	0.074	0.049	0.111	0.111	2.502	1.688	1.086	2.401	2.410	0.098	0.207	0.444	0.636	0.639

EQUIPMENT	FUEL TYPE	CO Emissions (tons) 1986	1987	1988	1989	1990	TSP Emissions (tons) 1986	1987	1988	1989	1990	Annual Average THC	NOx	SO2	CO	TSP
Crane #1	D	0.032	0.022	0.018	0.026	0.026	0.011	0.007	0.006	0.009	0.008	0.009	0.115	0.008	0.025	0.008
Crane #2	D	0.075	0.074	0.027	0.105	0.102	0.025	0.024	0.009	0.035	0.034	0.028	0.353	0.023	0.077	0.025
Emergency Gen #1	D	0.032	0.003	0.014	0.010	0.010	0.011	0.001	0.005	0.003	0.003	0.005	0.065	0.004	0.014	0.005
Emergency Gen #2	D	0.238	0.129	0.050	0.133	0.137	0.092	0.050	0.019	0.051	0.053	0.015	0.528	0.008	0.137	0.053
Emergency Gen #3	D	0.238	0.129	0.050	0.133	0.137	0.092	0.050	0.019	0.051	0.053	0.015	0.528	0.008	0.137	0.053
Flare (10-100)	NG		0.052	0.099	0.174	0.175		0.007	0.014	0.025	0.025	0.021	0.501	0.414	0.125	0.018
Flare Pilot and Purg	NG	0.007	0.007	0.007	0.007	0.007	0.001	0.001	0.001	0.001	0.001	0.001	0.027	0.023	0.007	0.001
TOTAL		0.622	0.416	0.265	0.588	0.594	0.232	0.140	0.073	0.175	0.177	0.094	2.117	0.488	0.522	0.163

Platform: UNIONA

Date: 10/12/90

ESTIMATED ANNUAL EMISSION RATES

EQUIPMENT	FUEL TYPE	THC Emissions (tons) 1986	1987	1988	1989	1990	NOx Emissions (tons) 1986	1987	1988	1989	1990	SO2 Emissions (tons) 1986	1987	1988	1989	1990
Crane #1	D	0.056	0.051	0.054	0.077	0.056	0.700	0.636	0.673	0.966	0.704	0.047	0.042	0.045	0.064	0.047
Crane #2	D	0.124	0.112	0.119	0.077	0.103	1.546	1.404	1.485	0.966	1.290	0.103	0.093	0.099	0.064	0.086
Emergency Gen	D	0.002	0.007	0.006	0.002	0.006	0.023	0.087	0.075	0.024	0.070	0.002	0.006	0.005	0.002	0.005
Turbine Compressor	NG	1.066	1.052	1.061	0.171		13.907	13.723	13.835	2.229		0.156	0.154	0.155	0.025	
Turbine Generator	NG	5.212	5.189	4.349	5.789	5.880	51.247	51.027	42.767	56.922	57.820	0.233	0.232	0.195	0.259	0.263
Vent	NG	106.720	133.009	491.510	43.677	230.000										
TOTAL		113.180	139.420	497.099	49.793	236.045	67.423	66.877	58.835	61.107	59.884	0.541	0.527	0.499	0.414	0.401

EQUIPMENT	FUEL TYPE	CO Emissions (tons) 1986	1987	1988	1989	1990	TSP Emissions (tons) 1986	1987	1988	1989	1990	Annual Average THC	NOx	SO2	CO	TSP
Crane #1	D	0.152	0.138	0.146	0.210	0.153	0.050	0.045	0.048	0.069	0.050	0.059	0.736	0.049	0.160	0.053
Crane #2	D	0.336	0.305	0.323	0.210	0.281	0.110	0.100	0.106	0.069	0.092	0.107	1.338	0.089	0.291	0.096
Emergency Gen	D	0.005	0.019	0.016	0.005	0.015	0.002	0.006	0.005	0.002	0.005	0.004	0.056	0.004	0.012	0.004
Turbine Compressor	NG	5.563	5.489	5.534	0.892		0.649	0.640	0.646	0.104		0.837	10.923	0.123	4.369	0.510
Turbine Generator	NG	14.270	14.209	11.908	15.850	16.100	1.737	1.730	1.450	1.930	1.960	5.284	51.957	0.237	14.467	1.761
Vent	NG											200.983				
TOTAL		20.326	20.160	17.927	17.167	16.549	2.548	2.521	2.255	2.174	2.107	207.275	65.010	0.501	19.300	2.423

Platform: UNIONB

Date: 10/12/90

ESTIMATED ANNUAL EMISSION RATES

EQUIPMENT	FUEL TYPE	THC Emissions (tons) 1986	1987	1988	1989	1990	NOx Emissions (tons) 1986	1987	1988	1989	1990	SO2 Emissions (tons) 1986	1987	1988	1989	1990
Crane #1	D	0.057	0.064	0.039	0.057	0.056	0.717	0.797	0.493	0.717	0.704	0.048	0.053	0.033	0.048	0.047
Crane #2	D	0.127	0.141	0.087	0.057	0.075	1.583	1.760	1.088	0.717	0.938	0.105	0.117	0.072	0.048	0.062
Emergency Generator	D	0.002	0.002	0.006	0.001	0.002	0.023	0.024	0.075	0.015	0.023	0.002	0.002	0.005	0.001	0.002
Gas Turbine	NG	4.077	3.932	3.943	4.854	4.830	40.094	38.664	38.772	47.728	47.495	0.183	0.176	0.176	0.217	0.216
Turbine Compressor	NG	0.618	0.968	1.061	0.171		8.064	12.626	13.835	2.230		0.091	0.142	0.155	0.025	
Vent	NG	69.000		367.471	185.334	230.000										
TOTAL		73.881	5.107	372.607	190.474	234.963	50.481	53.871	54.263	51.407	49.160	0.429	0.490	0.441	0.339	0.327

EQUIPMENT	FUEL TYPE	CO Emissions (tons) 1986	1987	1988	1989	1990	TSP Emissions (tons) 1986	1987	1988	1989	1990	Annual Average THC	NOx	SO2	CO	TSP
Crane #1	D	0.156	0.173	0.107	0.156	0.153	0.051	0.057	0.035	0.051	0.050	0.055	0.685	0.046	0.149	0.049
Crane #2	D	0.344	0.383	0.237	0.156	0.204	0.113	0.126	0.078	0.051	0.067	0.097	1.217	0.081	0.265	0.087
Emergency Generator	D	0.005	0.005	0.016	0.003	0.005	0.002	0.002	0.005	0.001	0.002	0.003	0.032	0.002	0.007	0.002
Gas Turbine	NG	11.164	10.766	10.796	13.290	13.225	1.359	1.311	1.314	1.618	1.610	4.327	42.550	0.194	11.848	1.442
Turbine Compressor	NG	3.226	5.050	5.534	0.892		0.376	0.589	0.646	0.104		0.704	9.189	0.103	3.675	0.429
Vent	NG											212.951				
TOTAL		14.895	16.377	16.690	14.497	13.587	1.901	2.085	2.078	1.825	1.729	218.138	53.674	0.426	15.944	2.009

Platform: UNIONC

Date: 10/12/90

ESTIMATED ANNUAL EMISSION RATES

EQUIPMENT	FUEL TYPE	THC Emissions (tons) 1986	1987	1988	1989	1990	NOx Emissions (tons) 1986	1987	1988	1989	1990	SO2 Emissions (tons) 1986	1987	1988	1989	1990
Crane #1	D	0.042	0.031	0.038	0.066	0.038	0.523	0.387	0.470	0.828	0.469	0.035	0.026	0.031	0.055	0.031
Crane #2	D	0.092	0.068	0.083	0.066	0.073	1.154	0.855	1.037	0.828	0.915	0.077	0.057	0.069	0.055	0.061
Emergency Generator	D	0.002	0.002	0.005	0.002	0.004	0.023	0.024	0.061	0.025	0.047	0.002	0.002	0.004	0.002	0.003
Firewater Pump	D	0.002	0.002	0.003	0.003	0.002	0.023	0.023	0.034	0.035	0.023	0.002	0.002	0.002	0.002	0.002
Vent	NG	65.090	194.741	470.281	399.924	391.000										
TOTAL		65.228	194.844	470.410	400.061	391.117	1.723	1.289	1.602	1.716	1.454	0.116	0.087	0.106	0.114	0.097

EQUIPMENT	FUEL TYPE	CO Emissions (tons) 1986	1987	1988	1989	1990	TSP Emissions (tons) 1986	1987	1988	1989	1990	Annual Average THC	NOx	SO2	CO	TSP
Crane #1	D	0.114	0.084	0.102	0.180	0.102	0.037	0.028	0.034	0.059	0.034	0.043	0.535	0.036	0.116	0.038
Crane #2	D	0.251	0.186	0.226	0.180	0.199	0.082	0.061	0.074	0.059	0.065	0.077	0.958	0.064	0.208	0.068
Emergency Generator	D	0.005	0.005	0.013	0.006	0.010	0.002	0.002	0.004	0.002	0.003	0.003	0.036	0.002	0.008	0.003
Firewater Pump	D	0.005	0.005	0.008	0.008	0.005	0.002	0.002	0.002	0.003	0.002	0.002	0.028	0.002	0.006	0.002
Vent	NG											304.207				
TOTAL		0.375	0.280	0.349	0.374	0.316	0.123	0.093	0.114	0.123	0.104	304.332	1.556	0.104	0.338	0.111

Appendix C
Vessel Database and Emission Rates

VESSEL DATA

Date: 10/12/90

Vessel Name	Owner	Length feet	Type	Year Built	Initial Date	Final Date	Charter Type	Fuel Reported for Which Platform	Other platforms serviced
Aces High	C&C Boats	97	Crew	1979	9-85	IN USE	MTC	Hondo	OS&T
Aces Wild	C&C Boats	97	Crew	1979	9-85	IN USE	MTC	Hondo	OS&T
Alberta Tide	Tidewater	194	Supply					Hidalgo	Hermosa
Caribbean	Zapata Gulf Pacific	166	Supply	1976	1976	IN USE		Union A	Union B, Union C
Chesapeake Seahorse	Zapata Gulf Pacific	180	Towing/Supply	1978	10-86	IN USE	Contract	Union A	Union B, Union C, Gina, Gilda, Irene, Edith, Tidelands
Clipper Johnny	Jackson Offshore	100	Crewboat	1976	1987	IN USE	2 years	Gilda	Gina
Clipper One	Jackson Offshore	95	Crew	1974	1987	IN USE		Union A	Union B, Union C
Doug C	C&C Boats, Inc.	90	Crew	1972	03/88	IN USE	Time Char	Elly	Ellen, Eureka, Tidelands
Gulf Fleet #70	Zapata Gulf Pacific	190	Supply	1984	1984	IN USE		Union A	Union B, Union C, Gina, Gilda, Irene, Edith, Tidelands
Hydro-1	Hydro Offshore	65	Utility Boat	1969	11-88	IN USE	Daily	Edith	Tidelands
Hydro-Transporter	Hydro Offshore	65	Crew boat	1966	11-88	IN USE	Time	Edith	Tidelands
Karen Tide	Tidewater Marine	100	crew	1979	09/89	IN USE	Long term	Hogan	Hillhouse, Houchin, Henry
Mathew	C&C Boats, Inc.	90	Crewboat	1973	09-89	IN USE	Spot	Habitat	Gail
Murdoch Tide	Tidewater Marine	65	Crewboat	1983	1983	IN USE	Long term		Gail
Raven	C&C Boats, Inc.	77	Crewboat	1972	02-90	IN USE	Spot	Habitat	
Shoshoni	Jackson Offshore	105	Crewboat	1977	1987	IN USE	Standby	Gilda	Gina
Tampa Sea Horse	Zapata Gulf Marine	147	Supply	1981	1981	IN USE		Elly	Ellen, Eureka, Tidelands
Taylor Tide	Tidewater Marine	156	Workboat	1980	1982	IN USE	Time	Habitat	
Toby Tide	Western Boat	180	Workboat	1980	1986	IN USE	Time	Harvest	
Uric Tide	Tidewater Marine	180	Supply	1982	1982	IN USE		Union A	Union B, Union C, Gina, Gilda
Victory Seahorse	Zapata Gulf Pacific	177	Supply	1983	1985	IN USE		Union A	Union B, Union C, Gina, Gilda, Irene, Edith, Tidelands

Vessel Data (con't)

Vessel/Equipment	Quantity	Size	Manufacturer	Model	Strokes	Trbchrg	Intercool		Retard		Other controls	
Aces High												
Main Engines	3	500 hp	DDC	12V71TI	2	Yes	Yes	Seawater	Yes	4	Yes	Genesis System
Electrical Generator	2	30 kW	DDC/DELCO	3-71	2	No	No		No	0	Yes	Genesis System
Firewater Pump	1	5 hp	DELCO	2C9804						0		
Aces Wild												
Main Engines	3	500 hp	DDC	12V71TI	2	Yes	Yes	Seawater	Yes	4	Yes	Genesis System
Electrical Generator	2	30 kW	DDC/DELCO	3-71	2	No	No		No	0	Yes	Genesis System
Firewater Pump	1	5 hp	DELCO	2C9804						0		
Alberta Tide												
Main Engines	2	2875 hp	EMD	16-645-E7	2	Yes	Yes			0		
Bow Thruster	0	0								0		
Electrical Generator	0	0								0		
Firewater Pump	0	0								0		
Caribbean												
Main Engines	2	2250 hp	Caterpillar	399TA	4	Yes	Yes	Keelcooler	Yes	4	No	
Bow Thruster	1	300 hp	Detroit	8V-71	2	No	No		No	0	No	
Electrical Generator	2	300 hp	Detroit	8V-71	2	No	No		No	0	No	
Chesapeake Seahorse												
Main Engines	2	4300 hp	EMD	12-645-E7A	2	Yes	Yes	Keelcooler	Yes	4	Yes	Genesis
Bow Thruster	1	300 hp	Detroit	8V-71	2	No	No		No	0	No	
Electrical Generator	2	99 kW	Detroit	8V-71	2	No	No		No	0	No	
Clipper Johnny												
Main Engines	3	525 hp	Detroit	12VA-71TA	2	Yes	Yes	Seawater	No	0	No	
Electrical Generator	2	30 kW	Detroit	3-71N	2	No	No		No	0	No	
Clipper One												
Main Engines	3	525 hp	Detroit	12VA-71-T1	2	Yes	Yes	Seawater	No	0	No	
Electrical Generator	2	0	Detroit	3-71N	2	No	No		No	0	No	
Doug C												
Main Engines	3	12 Cyl	Detroit Diesel	12-71TI	2	Yes	Yes	Seawater	No	0	No	
Electrical Generator	2	0	GM/AC Delco	3-71	2	No	No		No	0	No	
Firewater Pump	1	1 ?	Flomax 8	25214					No	0	No	
Gulf Fleet #70												
Main Engines	2	4610 bhp	EMD	12-645-E7C	2	Yes	Yes	Keelcooler	Yes	4	No	
Bow Thruster	1	500 hp	Detroit	12V-71	2	No	No		No	0	No	
Electrical Generator	2	99 kW	Detroit	6-71	2	No	No		No	0	No	

Vessel Data (con't)

Vessel/Equipment	Quantity	Size	Manufacturer	Model	Strokes	Trbchrg	Intercool		Retard		Other controls	
Hydro-1												
Main Engines	0	600 hp	Detroit Diesel			No				0	No	
Hydro-Transporter												
Main Engines	0	800 hp	Detroit Diesel			No				0	No	
Karen Tide												
Main Engines	3	540 hp	GM	12V71	2	Yes	Yes	Raw water	Yes	4	No	
Electrical Generator	2	30 kW	GM	371						0		
Mathew												
Main Engines	3	510 hp	General Motors	12V71T1	2	Yes	Yes	Seawater	Yes	4	Yes	Wet Exhaust
Electrical Generator	2	30 kW	General Motors	2-71	2	No	No		No	0	No	
Murdoch Tide												
Main Engines	2	540 hp	GM	12V71	2	Yes	Yes	Sep. cooler	Yes	4	No	
Raven												
Main Engines	2	510 hp	General Motors	12V71T1	2	Yes	Yes	Seawater	Yes	4	Yes	Wet Exhaust
Electrical Generator	1	20 kW	General Motors	2-71	2	No	No		No	0	No	
Shoshoni												
Main Engines	3	525 hp	Detroit	12VA-71 TI	2	Yes	Yes	Seawater	No	0	No	
Electrical Generator	2	30 kW	Detroit	3-71N	2	No	No		No	0	No	
Tampa Sea Horse												
Main Engines	2	800 hp	Caterpillar	D398	2	No	Yes	Seawater	No	0	No	
Bow Thruster	1	671 kW	Detroit Diesel	1062-5000	2	No	Yes		No	0	No	
Electrical Generator	2	671 kW	Detroit Diesel	10647002	2	No	Yes		No	0	No	
Firewater Pump	1	100 hp	U.S. Electric			No			No	0	No	
Taylor Tide												
Main Engines	2	1800 hp	GM	645	4	No	No			0		
Toby Tide												
Main Engines	2	1125 hp	Caterpillar	D399	4	Yes	Yes		Yes	4	Yes	Keel Cooler
Bow Thruster	1	230 hp	GM	8V71	4	No	No		No	0	No	
Electrical Generator	2	230 hp	GM	8V71	4	No	No		No	0	No	
Uric Tide												
Main Engines	2	2250 bhp	Caterpillar	D399T/A	4	Yes	Yes	Keelcooler	Yes	4	No	
Bow Thruster	1	325 bhp	Caterpillar	3406DIT	4	No	No			0	No	
Electrical Gnerator	2	135 kW	Catepillar	3306PCT	4	No	No		No	0	No	

Vessel Data (con't)

Vessel/Equipment	Quantity	Size	Manufacturer	Model	Strokes	Trbchrg	Intercool		Retard		Other controls	
Victory Seahorse												
Main Engines	2	5000 hp	EMD	ED3A 6-645	2	Yes	Yes	Keelcooler	Yes	4	Yes	Genesis
Bow Thruster	1	300 hp	Detroit	8V-71	2	No	No		No	0	No	
Electrical Generator	2	99 kW	Detroit	8V-71	2	No	No		No	0	No	
Firewater Pump	2	300 hp	Detroit	8V-71	2	No	No		No	0	No	

Vessel Data (con't)

Vessel/Equipment	Fuel Type	Fuel Consumption at Maximum Load	Fuel Use 1986	1987	1988	1989	1990	Units	Emission Code
Aces High									
Main Engines	D	0.0	0.000	0.000	0.000	0.000	0.000		53
Electrical Generator	D	0.0	0.000	0.000	0.000	0.000	0.000		
Firewater Pump	D	0.0	0.000	0.000	0.000	0.000	0.000		
Total Fuel	D	0.0	105.709	0.000	85.399	77.095	0.000	1000 gal	
Aces Wild									
Main Engines	D	0.0	0.000	0.000	0.000	0.000	0.000		53
Electrical Generator		0.0	0.000	0.000	0.000	0.000	0.000		
Firewater Pump		0.0	0.000	0.000	0.000	0.000	0.000		
Total Fuel	D	0.0	98.360	0.000	76.282	86.993	0.000	1000 gal	
Alberta Tide									
Main Engines	D	0.0	0.000	0.000	0.000	0.000	0.000		51
Bow Thruster	D	0.0	0.000	0.000	0.000	0.000	0.000		
Electrical Generator	D	0.0	0.000	0.000	0.000	0.000	0.000		
Firewater Pump	D	0.0	0.000	0.000	0.000	0.000	0.000		
Caribbean									
Main Engines	D	0.0	0.000	0.000	0.000	0.000	0.000		53
Bow Thruster	D	0.0	0.000	0.000	0.000	0.000	0.000		
Electrical Generator	D	0.0	0.000	0.000	0.000	0.000	0.000		
Total Fuel	D	0.0	0.000	0.000	0.000	45.776	0.000	1000 gal	
Chesapeake Seahorse									
Main Engines	D	0.0	0.000	0.000	0.000	0.000	0.000		53
Bow Thruster	D	0.0	0.000	0.000	0.000	0.000	0.000		
Electrical Generator		0.0	0.000	0.000	0.000	0.000	0.000		
Total Fuel	D	188.0	0.000	0.000	0.000	15.509	173.375	1000 gal	
Clipper Johnny									
Main Engines	D	0.0	0.000	0.000	0.000	0.000	0.000		51
Electrical Generator	D	0.0	0.000	0.000	0.000	0.000	0.000		
Total Fuel	D	0.0	0.000	93.935	230.315	169.186	175.000	1000 gal	
Clipper One									
Main Engines	D	0.0	0.000	0.000	0.000	0.000	0.000		51
Electrical Generator	D	0.0	0.000	0.000	0.000	0.000	0.000		
Total Fuel	D	0.0	0.000	105.115	162.060	147.457	150.000	1000 gal	

Vessel Data (con't)

Vessel/Equipment	Fuel Type	Fuel Consumption at Maximum Load	Fuel Use 1986	1987	1988	1989	1990	Units	Emission Code
Doug C									
Main Engines	D	0.0	0.000	0.000	0.000	0.000	0.000		51
Electrical Generator	D	0.0	0.000	0.000	0.000	0.000	0.000		
Firewater Pump	D	0.0	0.000	0.000	0.000	0.000	0.000		
Total Fuel	D	0.0	0.000	0.000	0.000	120.540	120.540	1000 gal	51
Gulf Fleet #70									
Main Engines	D	0.0	0.000	0.000	0.000	0.000	0.000		53
Bow Thruster	D	0.0	0.000	0.000	0.000	0.000	0.000		
Electrical Generator	D	0.0	0.000	0.000	0.000	0.000	0.000		
Total Fuel	D	142.0	0.000	0.000	0.000	16.658	0.000	1000 gal	
Hydro-1									
Total Fuel	D	0.0	0.000	0.000	1.000	6.000	6.000	1000 gal	51
Main Engines	D	0.0	0.000	0.000	0.000	0.000	0.000		51
Hydro-Transporter									
Total Fuel	D	0.0	0.000	0.000	13.894	83.200	83.200	1000 gal	51
Main Engines	D	0.0	0.000	0.000	0.000	0.000	0.000		51
Karen Tide									
Main Engines	D	24.0	0.000	0.000	0.000	0.000	0.000	1000 gal	52
Electrical Generator	D	3.0	0.000	0.000	0.000	0.000	0.000		
Total Fuel	D	0.0	0.000	0.000	0.000	175.000	0.000	1000 gal	52
Mathew									
Main Engines	D	42.8	0.000	0.000	0.000	43.992	120.600	1000 gal	53
Electrical Generator	D	0.0	0.000	0.000	0.000	0.000	0.000		
Murdoch Tide									
Main Engines	D	24.0	0.000	0.000	0.000	0.000	0.000		52
Raven									
Main Engines	D	27.6	0.000	0.000	0.000	0.000	11.676	1000 gal	53
Electrical Generator	D	0.6	0.000	0.000	0.000	0.000	0.000		
Shoshoni									
Main Engines	D	0.0	0.000	0.000	0.000	0.000	0.000		51
Electrical Generator	D	0.0	0.000	0.000	0.000	0.000	0.000		
Total Fuel	D	0.0	0.000	10.470	62.352	84.723	75.000	1000 gal	

Vessel Data (con't)

Vessel/Equipment	Fuel Type	Fuel Consumption at Maximum Load	Fuel Use 1986	1987	1988	1989	1990	Units	Emission Code
Tampa Sea Horse									
Main Engines	D	0.0	0.000	0.000	0.000	0.000	0.000		51
Bow Thruster	D	0.0	0.000	0.000	0.000	0.000	0.000		
Electrical Generator	D	0.0	0.000	0.000	0.000	0.000	0.000		
Firewater Pump	D	0.0	0.000	0.000	0.000	0.000	0.000		
Total Fuel	D	0.0	0.000	0.000	0.000	83.244	83.244	1000 gal	51
Taylor Tide									
Main Engines	D	92.0	0.000	0.000	0.000	0.000	0.000		51
Toby Tide									
Main Engines	D	94.0	0.000	0.000	0.000	0.000	0.000		53
Bow Thruster	D	3.0	0.000	0.000	0.000	0.000	0.000		
Electrical Generator	D	3.0	0.000	0.000	0.000	0.000	0.000		
Total Fuel	D	101.0	252.175	288.000	211.000	126.000	126.000	1000 gal	
Uric Tide									
Main Engines	D	0.0	0.000	0.000	0.000	0.000	0.000		53
Bow Thruster	D	0.0	0.000	0.000	0.000	0.000	0.000		
Electrical Gnerator	D	0.0	0.000	0.000	0.000	0.000	0.000		
Total Fuel	D	93.0	96.143	71.265	0.000	0.000	0.000	1000 gal	
Victory Seahorse									
Main Engines	D	0.0	0.000	0.000	0.000	0.000	0.000		53
Bow Thruster	D	0.0	0.000	0.000	0.000	0.000	0.000		
Electrical Generator	D	0.0	0.000	0.000	0.000	0.000	0.000		
Firewater Pump	D	0.0	0.000	0.000	0.000	0.000	0.000		
Total Fuel	D	142.0	0.000	39.361	166.385	129.603	148.555	1000 gal	

Date: 10/12/90

ESTIMATED ANNUAL VESSEL EMISSION RATES

VESSEL	FUEL TYPE	THC Emissions (tons) 1986	1987	1988	1989	1990	NOx Emissions (tons) 1986	1987	1988	1989	1990	SO2 Emissions (tons) 1986	1987	1988	1989	1990
Aces High	D	1.734		1.401	1.264		17.442		14.091	12.721		0.831		0.672	0.606	
Aces Wild	D	1.613		1.251	1.427		16.229		12.587	14.354		0.774		0.600	0.684	
Alberta Tide	D															
Caribbean	D				0.751					7.553					0.360	
Chesapeake Seahorse	D				0.254	2.843				2.559	28.607				0.122	1.364
Clipper Johnny	D		1.541	3.777	2.775	2.870		25.832	63.337	46.526	48.125		0.739	1.811	1.331	1.376
Clipper One	D		1.724	2.658	2.418	2.460		28.907	44.567	40.551	41.250		0.827	1.275	1.160	1.180
Doug C	D				1.977	1.977				33.149	33.149				0.948	0.948
Grand Caymen	D															
Gulf Fleet #70	D				0.273					2.749					0.131	
Hydro-1	D			0.016	0.098	0.098			0.275	1.650	1.650			0.008	0.047	0.047
Hydro-Transporter	D			0.228	1.364	1.364			3.821	22.880	22.880			0.109	0.654	0.654
Karen Tide	D				2.870					36.313					1.376	
Mathew	D				0.721	1.978				7.259	19.899				0.346	0.949
Murdoch Tide	D															
Raven	D					0.191					1.927					0.092
Shoshoni	D		0.172	1.023	1.389	1.230		2.879	17.147	23.299	20.625		0.082	0.490	0.666	0.590
Tampa Sea Horse	D				1.365	1.365				22.892	22.892				0.655	0.655
Toby Tide	D	4.136	4.723	3.460	2.066	2.066	41.609	47.520	34.815	20.790	20.790	1.983	2.265	1.660	0.991	0.991
Uric Tide	D	1.577	1.169				15.864	11.759				0.756	0.561			
Victory Seahorse	D		0.646	2.729	2.125	2.436		6.495	27.454	21.385	24.512		0.310	1.309	1.019	1.168
TOTAL		9.060	9.975	16.543	23.137	20.878	91.144	123.392	218.094	316.630	286.306	4.344	4.784	7.934	11.096	10.014

Vessel Emission Rates (con't)

VESSEL	FUEL TYPE	CO Emissions (tons) 1986	1987	1988	1989	1990	TSP Emissions (tons) 1986	1987	1988	1989	1990	Annual Average THC	NOx	SO2	CO	TSP
Aces High	D	2.188		1.768	1.596		2.643		2.135	1.927		1.466	14.751	0.703	1.851	2.235
Aces Wild	D	2.036		1.579	1.801		2.459		1.907	2.175		1.430	14.390	0.686	1.805	2.180
Alberta Tide	D									1.144		0.751	7.553	0.360	0.948	1.144
Caribbean	D				0.948					0.388	4.334	1.549	15.583	0.743	1.955	2.361
Chesapeake Seahorse	D				0.321	3.589				4.230	4.375	2.741	45.955	1.314	3.459	4.178
Clipper Johnny	D		1.944	4.768	3.502	3.623		2.348	5.758	3.686	3.750	2.315	38.818	1.110	2.922	3.529
Clipper One	D		2.176	3.355	3.052	3.105		2.628	4.052	3.014	3.014	1.977	33.149	0.948	2.495	3.014
Doug C	D				2.495	2.495										
Grand Cayman	D									0.416		0.273	2.749	0.131	0.345	0.416
Gulf Fleet #70	D				0.345					0.150	0.150	0.071	1.192	0.034	0.090	0.108
Hydro-1	D			0.021	0.124	0.124			0.025	2.080	2.080	0.986	16.527	0.473	1.244	1.502
Hydro-Transporter	D			0.288	1.722	1.722			0.347	4.375		2.870	36.313	1.376	3.623	4.375
Karen Tide	D				3.623					1.100	3.015	1.350	13.579	0.647	1.704	2.057
Mathew	D				0.911	2.496										
Murdoch Tide	D										0.292	0.191	1.927	0.092	0.242	0.292
Raven	D					0.242										
Shoshoni	D		0.217	1.291	1.754	1.553		0.262	1.559	2.118	1.875	0.953	15.987	0.457	1.203	1.453
Tampa Sea Horse	D				1.723	1.723				2.081	2.081	1.365	22.892	0.655	1.723	2.081
Toby Tide	D	5.220	5.962	4.368	2.608	2.608	6.304	7.200	5.275	3.150	3.150	3.290	33.105	1.578	4.153	5.016
Uric Tide	D	1.990	1.475				2.404	1.782				1.373	13.811	0.658	1.733	2.093
Victory Seahorse	D		0.815	3.444	2.683	3.075		0.984	4.160	3.240	3.714	1.984	19.961	0.951	2.504	3.024
TOTAL		11.434	12.589	20.882	29.208	26.355	13.810	15.204	25.218	35.274	31.830	26.935	348.241	12.917	33.998	41.060

Appendix D
Blank Survey Questionnaire Forms

PART 1: GENERAL FACILITY DESCRIPTION

	Current Database	Correction, if needed
Platform Name :		
Operator :		
Tract Number :		
Field/Area :		
County :		
Treating Facility :		
Drilling Startup (yr) :		
Drilling Time (yrs) :		
Peak Production (bbl/day):		
Year of Peak :		
Anticipated Year of Decommissioning :		
Power cable (Yes/No) :		

Please write correction below the current value, if needed:

	1986	1987	1988	1989	Projected 1990
Cumulative Number of Development Wells Capable of Producing					
Annual Gas Production (10^6 scf)					
Annual Oil Production (10^3 bbl)					

PART 1: GENERAL FACILITY DESCRIPTION--fuel Platform:

Fuel Code*	Description	Lower Heating Value	Units	Sulfur Content	Units

* Please use a unique code (i.e., D1, D2, etc.) if you use more than one type of liquid or gaseous fuel.

PART 2: FUEL CONSUMING EQUIPMENT: Reciprocating Engines and Fired Units

Platform:

Equipment Description	Size or Capacity	Units*	Manufacturer	Model Number	For Engines Only: 2-strk/ 4-strk	Turbo (Y/N)	Intercool (Y/N)	Controlled (Y/N)	Control Description

* Engine size units: hp (horsepower) Fired Units size units: 10^6 Btu/hr (MMBtu/hr).

PART 2: FUEL CONSUMING EQUIPMENT: Reciprocating and Fired Units (con't) Platform:

Equipment Description	Fuel Type*	Fuel Consumption at Maximum Load	Annual Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units**
		gal/hr						

* Fuel types: D (Diesel) or NG (Natural Gas).

** Annual Fuel Consumption Units: Gal (Gallons) or scf [in 10^3 (thousands) or 10^6 (millions), if appropriate].

PART 2: FUEL CONSUMING EQUIPMENT: Turbine Equipment

Platform:

Equipment Description	Engine Size	Units	Manufacturer	Model Number	Application (Generator/Compressor)	Fuel Consumption at Max Load NG (10^3 scf/hr)	Fuel Consumption at Max Load Diesel (gal/hr)	Water Injection (Y/N)	Water Injection Ratio, Maximum (lb water/lb fuel)

PART 2: FUEL CONSUMING EQUIPMENT: Turbine Equipment (con't)

Fuel Consumption Mode	Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units
NG with water inj.						10^6 scf
NG w/o water inj.						10^6 scf
TOTAL NG						10^6 scf
Dsl with water inj.						10^3 gal
Dsl w/o water inj.						10^3 gal
TOTAL DIESEL						10^3 gal

PART 3: VESSELS

PART A: VESSEL DESCRIPTION

Platform:

Vessel Name	Vessel Owner	Length (feet)	Vessel Type	Year Built	Initial Date of Service	Final Date of Service	Charter Type	Other Platforms Serviced	Fuel Use Reported for which Platform*

PART 3 VESSELS: Equipment Description

Platform:

Vessel Name Equip. Descrip	Quantity	Size Each	Units	Manufacturer	Model Number	2-strk/ 4-strk	Turbo (Y/N)	Intercooled (Y/N)	Intercooled Type**	Timing Retard (Y/N)	Timing Retard Degrees	Other Control (Y/N)	Other Control Describe
________													
Main Engines													
Bow Thruster													
Electrical Generat													
Firewater Pump													
________													
Main Engines													
Bow Thruster													
Electrical Generat													
Firewater Pump													
________													
Main Engines													
Bow Thruster													
Electrical Generat													
Firewater Pump													

PART 3 VESSELS: Equiment Description (con't)

Platform:

Vessel Name / Equip. Descrip	Quantity	Size Each	Units	Manufacturer	Model Number	2-strk/ 4-strk	Turbo (Y/N)	Intercooled (Y/N)	Intercooled Type**	Timing Retard (Y/N)	Timing Retard Degrees	Other Control (Y/N)	Other Control Describe
______________													
Main Engines													
Bow Thruster													
Electrical Generat													
Firewater Pump													
______________													
Main Engines													
Bow Thruster													
Electrical Generat													
Firewater Pump													
______________													
Main Engines													
Bow Thruster													
Electrical Generat													
Firewater Pump													

* For boats which provide service to more than one platform, indicate all platforms, but report annual fuel consumption once only.

** For intercooled engines, device types are Seawater, Jacket Water, or Separate Circuit.

PART 3 VESSELS: Fuel Consumption

Platform:

Vessel Name Equip. Descrip	Fuel Consumption at Maximum Load	Annual Fuel Consumption* Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units**
________							
Main Engines	gal/hr						
Bow Thruster	gal/hr						
Electrical Generator	gal/hr						
Firewater Pump	gal/hr						
TOTAL FUEL							
________							
Main Engines	gal/hr						
Bow Thruster	gal/hr						
Electrical Generator	gal/hr						
Firewater Pump	gal/hr						
TOTAL FUEL							
________							
Main Engines	gal/hr						
Bow Thruster	gal/hr						
Electrical Generator	gal/hr						
Firewater Pump	gal/hr						
TOTAL FUEL							

PART 3 VESSELS: Fuel Consumption (con't)

Platform:

Vessel Name Equip. Descrip	Fuel Consumption at Maximum Load	Annual Fuel Consumption* Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units**
______							
Main Engines	gal/hr						
Bow Thruster	gal/hr						
Electrical Generator	gal/hr						
Firewater Pump	gal/hr						
TOTAL FUEL							
______							
Main Engines	gal/hr						
Bow Thruster	gal/hr						
Electrical Generator	gal/hr						
Firewater Pump	gal/hr						
TOTAL FUEL							
______							
Main Engines	gal/hr						
Bow Thruster	gal/hr						
Electrical Generator	gal/hr						
Firewater Pump	gal/hr						
TOTAL FUEL							

* Indicate total annual vessel fuel consumption if it is not available for the indicated equipment items.
** Fuel Consumption Units: Gal (gallons) [or 10^3 (thousands) if appropriate]

PART 4: CONTRACTOR EQUIPMENT

Platform:

Equipment Description	Owner	Engine Size	Units*	Manufacturer	Model Number	2-stroke/ 4-stroke	Turbo (Y/N)	Intercool (Y/N)	Control (Y/N)	Control Description	Initial Date of Service	Final Date of Service

* Size units: hp (horsepower) for engines. For fired units, 10^6 Btu/hr (MMBtu/hr).

Equipment Description	Fuel Type*	Fuel Consumption at Maximum Load	Annual Fuel Consumption Actual 1986	Actual 1987	Actual 1988	Actual 1989	Projected 1990	Units**

* Fuel types: D (diesel) or NG (Natural Gas).

** Annual Fuel Consumption Units: Gal (gallons) or scf [in 10^3 (thousands) or 10^6 (millions), if appropriate].

Appendix E
Texts of Regulations

Federal Clean Air Act Amendments, 1990, Title VIII Section 801
South Coast AQMD Rule 1110.2 and Rule 1134

CLEAN AIR ACT AMENDMENTS OF 1990

CONFERENCE REPORT

TO ACCOMPANY

S. 1630

OCTOBER 26, 1990.—Ordered to be printed

(b) EFFECTIVE DATES.—(1) Except as otherwise expressly provided, the amendments made by this Act shall be effective on the date of enactment of this Act.

(2) The Administrator's authority to assess civil penalties under section 205(c) of the Clean Air Act, as amended by this Act, shall apply to violations that occur or continue on or after the date of enactment of this Act. Civil penalties for violations that occur prior to such date and do not continue after such date shall be assessed in accordance with the provisions of the Clean Air Act in effect immediately prior to the date of enactment of this Act.

(3) The civil penalties prescribed under sections 205(a) and 211(d)(1) of the Clean Air Act, as amended by this Act, shall apply to violations that occur on or after the date of enactment of this Act. Violations that occur prior to such date shall be subject to the civil penalty provisions prescribed in sections 205(a) and 211(d) of the Clean Air Act in effect immediately prior to the enactment of this Act. The injunctive authority prescribed under section 211(d)(2) of the Clean Air Act, as amended by this Act, shall apply to violations that occur or continue on or after the date of enactment of this Act.

(4) For purposes of paragraphs (2) and (3), where the date of a violation cannot be determined it will be assumed to be the date on which the violation is discovered.

TITLE VIII—MISCELLANEOUS PROVISIONS

SEC. 801. OCS AIR POLLUTION.

Title III of the Clean Air Act is amended by adding the following new section after section 327:

"SEC. 328. AIR POLLUTION FROM OUTER CONTINENTAL SHELF ACTIVITIES.

"(a)(1) APPLICABLE REQUIREMENTS FOR CERTAIN AREAS.—Not later than 12 months after the enactment of the Clean Air Act Amendments of 1990, following consultation with the Secretary of the Interior and the Commandant of the United States Coast Guard, the Administrator, by rule, shall establish requirements to control air pollution from Outer Continental Shelf sources located offshore of the States along the Pacific, Arctic and Atlantic Coasts, and along the United States Gulf Coast off the State of Florida eastward of longitude 87 degrees and 30 minutes ('OCS sources') to attain and maintain Federal and State ambient air quality standards and to comply with the provisions of part C of title I. For such sources located within 25 miles of the seaward boundary of such States, such requirements shall be the same as would be applicable if the source were located in the corresponding onshore area, and shall include, but not be limited to, State and local requirements for emission controls, emission limitations, offsets, permitting, monitoring, testing, and reporting. New OCS sources shall comply with such requirements on the date of promulgation and existing OCS sources shall comply on the date 24 months thereafter. The Administrator shall update such requirements as necessary to maintain consistency with onshore regulations. The authority of this subsection shall supersede section 5(a)(8) of the Outer Continental Shelf Lands Act but shall not repeal or modify any other Federal, State, or local authorities with respect to air quality. Each requirement established under this section shall be treated, for purposes of sections 113, 114, 116, 120, and 304, as a standard under section 111 and a violation of any such requirement shall be considered a violation of section 111(e).

"(2) EXEMPTIONS.—The Administrator may exempt an OCS source from a specific requirement in effect under regulations under this subsection if the Administrator finds that compliance with a pollution control technology requirement is technically infeasible or will cause an unreasonable threat to health and safety. The Administrator shall make written findings explaining the basis of any exemption issued pursuant to this subsection and shall impose another requirement equal to or as close in stringency to the original requirement as possible. The Administrator shall ensure that any increase in emissions due to the granting of an exemption is offset by reductions in actual emissions, not otherwise required by this Act, from the same source or other sources in the area or in the corresponding onshore area. The Administrator shall establish procedures to provide for public notice and comment on exemptions proposed pursuant to this subsection.

"(3) STATE PROCEDURES.—Each State adjacent to an OCS source included under this subsection may promulgate and submit to the Administrator regulations for implementing and enforcing the requirements of this subsection. If the Administrator finds that the State regulations are adequate, the Administrator shall delegate to that State any authority the Administrator has under this Act to implement and enforce such requirements. Nothing in this subsection shall prohibit the Administrator from enforcing any requirement of this section.

"(4) DEFINITIONS.—For purposes of subsections (a) and (b)—

"(A) OUTER CONTINENTAL SHELF.—The term 'Outer Continental Shelf' has the meaning provided by section 2 of the Outer Continental Shelf Lands Act (43 U.S.C. 1331).

"(B) CORRESPONDING ONSHORE AREA.—The term 'corresponding onshore area' means, with respect to any OCS source, the onshore attainment or nonattainment area that is closest to the source, unless the Administrator determines that another area with more stringent requirements with respect to the control and abatement of air pollution may reasonably be expected to be affected by such emissions. Such determination shall be based on the potential for air pollutants from the OCS source to reach the other onshore area and the potential of such air pollutants to affect the efforts of the other onshore area to attain or maintain any Federal or State ambient air quality standard or to comply with the provisions of part C of title I.

"(C) OUTER CONTINENTAL SHELF SOURCE.—The terms 'Outer Continental Shelf source' and 'OCS source' include any equipment, activity, or facility which—

"(i) emits or has the potential to emit any air pollutant,

"(ii) is regulated or authorized under the Outer Continental Shelf Lands Act, and

"(iii) is located on the Outer Continental Shelf or in or on waters above the Outer Continental Shelf.

Such activities include, but are not limited to, platform and drill ship exploration, construction, development, production, processing, and transportation. For purposes of this subsection, emissions from any vessel servicing or associated with an OCS source, including emissions while at the OCS source or en route to or from the OCS source within 25 miles of the OCS source, shall be considered direct emissions from the OCS source.

"(D) NEW AND EXISTING OCS SOURCES.—The term 'new OCS source' means an OCS source which is a new source within the meaning of section 111(a). The term 'existing OCS source' means any OCS source other than a new OCS source.

"(b) REQUIREMENTS FOR OTHER OFFSHORE AREAS.—For portions of the United States Gulf Coast Outer Continental Shelf that are adjacent to the States not covered by subsection (a) which are Texas, Louisiana, Mississippi, and Alabama, the Secretary shall consult with the Administrator to assure coordination of air pollution control regulation for Outer Continental Shelf emissions and emissions in adjacent onshore areas. Concurrently with this obligation, the Secretary shall complete within 3 years of enactment of this section a research study examining the impacts of emissions from Outer Continental Shelf activities in such areas that fail to meet the national ambient air quality standards for either ozone or nitrogen dioxide. Based on the results of this study, the Secretary shall consult with the Administrator and determine if any additional actions are necessary. There are authorized to be appropriated such sums as may be necessary to provide funding for the study required under this section.

"(c)(1) COASTAL WATERS.—The study report of section 112(n) of the Clean Air Act shall apply to the coastal waters of the United States to the same extent and in the same manner as such requirements apply to the Great Lakes, the Chesapeake Bay, and their tributary waters.".

"(2) The regulatory requirements of section 112(n) of the Clean Air Act shall apply to the coastal waters of the States which are subject to subsection (a) of this section, to the same extent and in the same manner as such requirements apply to the Great Lakes, the Chesapeake Bay, and their tributary waters.".

SEC. 802. GRANTS FOR SUPPORT OF AIR POLLUTION PLANNING AND CONTROL PROGRAMS.

(a) GRANTS.—Subparagraphs (A) and (B) of section 105(a)(1) of the Clean Air Act are amended to read as follows:

"(A) The Administrator may make grants to air pollution control agencies, within the meaning of paragraph (1), (2), (3), (4), or (5) of section 302, in an amount up to three-fifths of the cost of implementing programs for the prevention and control of air pollution or implementation of national primary and secondary ambient air quality standards. For the purpose of this section, 'implementing' means any activity related to the planning, developing, establishing, carrying-out, improving, or maintaining of such programs.

"(B) Subject to subsections (b) and (c) of this section, an air pollution control agency which receives a grant under subparagraph (A) and which contributes less than the required two-fifths minimum shall have 3 years following the date of the enactment of the Clean Air Act Amendments of 1990 in which to contribute such amount. If such an agency fails to meet and maintain this required level, the Administrator shall reduce the amount of the Federal contribution accordingly.".

(b) CONFORMING AMENDMENT.—Section 105(a)(1)(C) of the Clean Air Act is amended by striking "(B)" and inserting "(A)".

(c) LIMITATION ON GRANTS.—Section 105(b) of the Clean Air Act is amended by—

(1) inserting "(1)" immediately after "(b)"

(2) striking all that follows "(3) the financial need of the respective agencies."; and

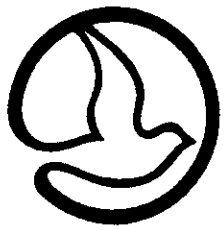
(3) redesignating paragraphs (1), (2), and (3) as subparagraphs (A), (B), and (C) respectively.

(d) LIMITATION.—Section 105 of the Clean Air Act is amended by redesignating subsection (c) as paragraph (2) of subsection (b) and by striking all that follows "into which such area extends." in the newly designated paragraph (2) and inserting "Subject to the provisions of paragraph (1) of this subsection, no State shall have made available to it for application less than one-half of 1 per centum of the annual appropriation for grants under this section for grants to agencies within such State.".

(e) MAINTENANCE OF EFFORT.—Section 105 of the Clean Air Act is amended by inserting the following new subsection after subsection (b):

"(c) MAINTENANCE OF EFFORT.—(1) No agency shall receive any grant under this section during any fiscal year when its expenditures of non-Federal funds for recurrent expenditures for air pollution control programs will be less than its expenditures were for such programs during the preceding fiscal year. In order for the Administrator to award grants under this section in a timely manner each fiscal year, the Administrator shall compare an agency's prospective expenditure level to that of its second preceding fiscal year. The Administrator shall revise the current regulations which define applicable nonrecurrent and recurrent expenditures, and in so

Rules and Regulations



SOUTH COAST
AIR QUALITY MANAGEMENT DISTRICT
9150 Flair Drive
El Monte, CA 91731

(Adopted August 3, 1990)(Amended September 7, 1990)

RULE 1110.2. EMISSIONS FROM GASEOUS- AND LIQUID-FUELED INTERNAL COMBUSTION ENGINES

(a) Definitions

(1) EMERGENCY STANDBY ENGINE is an engine which operates as a temporary replacement for primary mechanical or electrical power during periods of fuel or energy shortage or while the primary power supply is under repair.

(2) EXISTING ENGINE is an engine for which prior to August 3, 1990:

(A) A valid permit to construct or operate pursuant to Rules 201 and/or 203 has been issued, or

(B) An application for a permit to construct or operate which has been deemed complete by the Executive Officer has been submitted.

(3) FACILITY is one or more parcels of land in physical contact, or separated solely by a public roadway, on which engines operate.

(4) INTERNAL COMBUSTION ENGINE (ENGINE) is any spark- or compression-ignited internal combustion engine, not including engines used for self-propulsion.

(5) PORTABLE INTERNAL COMBUSTION ENGINE is an engine which is not attached to a foundation and is not operated at a single facility for more than one year and is not a replacement engine for a specific application which lasts or is intended to last for more than one year.

(6) RATED BRAKE HORSEPOWER (bhp) is the rating specified by the manufacturer and listed on the nameplate.

(7) REACTIVE ORGANIC GASES (ROG) means any gaseous chemical compound which contains the element carbon; excluding carbon monoxide, carbon dioxide, carbonic acid, carbonates and metallic carbides; and excluding methane.

(8) STATIONARY INTERNAL COMBUSTION ENGINE is an engine which is either attached to a foundation or if not so attached is operated or is intended to be operated at a single facility for more than one year, including any replacement engine for a specific application which lasts or is intended to last for more than one year.

(b) Applicability

All stationary engines over 50 bhp and all portable engines over 100 bhp are subject to this rule.

(c) Requirements

The owner or operator of any internal combustion engine subject to this rule shall:

(1) replace any such engine with an electric motor, or

(2) reduce emissions from such engine to the following compliance limits in accordance with the compliance schedule of paragraph (e):

(A) The owner or operator of any engine may, in lieu of conversion to electrical power, reduce the emissions of carbon monoxide (CO) from such engine to no more than 2000 PPM; reduce the emissions of oxides of nitrogen (NO_x) to a compliance limit of 36 PPM; and reduce the emissions of reactive organic gases (ROG) measured as methane to a compliance limit of 250 PPM; all measured by volume corrected to 15 percent oxygen on a dry basis and averaged over 15 minutes.

(B) Nothwithstanding the provisions of subparagraph (c)(2)(A), the owner or operator of any electric-power-generating engine, any portable engine, any landfill-gas- or sewage-digester-gas-fueled engine, any engine used to drive a water supply or conveyance pump except for aeration facilities, any oil field-produced-gas-fired engine, any integral engine-compressor application operating less than 4000 hours per calendar year, or any liquefied petroleum gas (LPG)-fueled engine may, in lieu of conversion to electrical power, reduce the emissions of carbon monoxide (CO) to no more than 2000 PPM by volume corrected to 15 percent oxygen on a dry basis and averaged over 15 minutes, and reduce the emissions of oxides of nitrogen (NO_x), and reactive organic gases (ROG) measured as methane from such engines to the following compliance limit:

$$\text{Compliance Limit} = \text{Reference Limit} \times \frac{EFF}{25\%}$$

Where:

Compliance Limit = allowable NO_x or ROG emissions (ppm by volume)

Reference Limit = the NO_x or ROG emission limit (ppm by volume) corrected to 15 percent oxygen on a dry basis, and averaged over 15 consecutive minutes. These limits for various bhp ratings (continuous rating by the manufacturer) are as follows:

REFERENCE EMISSION LIMITS, PPM

Bhp Rating	NO_x	ROG
500 bhp and greater	36	250
50 to 500 bhp	45	250

And,

$$EFF = \frac{3413 \times 100\%}{\text{Actual Heat Rate at HHV of Fuel (Btu/kW-hr)}}$$

or

$$EFF = (\text{Manufacturer's Rated Efficiency at LHV}) \times \frac{LHV}{HHV}$$

EFF = the demonstrated percent efficiency at full load when averaged over 15 consecutive minutes of the engine only, as calculated, within 30 days of the first source test, without consideration of any downstream energy recovery from the actual heat rate, (Btu/kW-hr) or 1.34 (Btu/hp-hr); corrected to the HHV (higher heating value) of the fuel as measured at peak load for that facility; or the manufacturer's continuous rated percent efficiency (manufacturer's rated efficiency) of the engine after correction from LHV (lower heating value) to the HHV of

the fuel, whichever efficiency is higher. The value of EFF shall not be less than 25 percent. Engines with lower efficiencies will be assigned a 25-percent efficiency for this calculation.

(d) Emission Control Plan

The owner/operator of any existing engine shall submit to the District (Office of Operations) for approval an emissions control plan of all actions and alternatives, including a schedule of increments of progress, which will be taken to meet or exceed the requirements or applicable emissions limitations in paragraph (c) and the compliance schedule in paragraph (e).

(1) Such plan shall contain, at a minimum, a list that provides the following for each engine:

(A) SCAQMD permit or identification number;

(B) name of engine manufacturer;

(C) model designation;

(D) rated brake horsepower;

(E) specific fuel consumption, gal/bhp-hr or cu ft/bhp-hr, and HHV for each type of fueling, gas/liquid;

(F) type of liquid and/or type of gaseous fuel;

(G) total hours of operation on previous one-year period, including hours of operation on a daily basis; and

(H) fuel consumption (cubic feet of gas or gallons liquid) for the previous one-year period.

(I) stack modifications to facilitate continuous in-stack monitoring and/or source testing.

(2) A list of all engines required to be controlled, identifying the type of emission control to be applied to such engines along with documentation showing existing emissions of NO_x, ROG, and CO.

(3) Supporting documentation for any units exempt under the provisions of paragraph (h).

(e) Compliance

The owner or operator of an engine(s) shall comply with the requirements of paragraph (c) of this rule in accordance with the following schedule:

(1) For existing engines to be replaced with electric motors in accordance with subparagraph (c)(1):

(A) By December 31, 1992, submit an emission control plan for Executive Officer approval;

(B) By April 30, 1998, submit applications for permit to construct and permit to operate motors where applicable;

(C) By September 30, 1999, initiate equipment installation; and

(D) By December 31, 1999, have system under compliance, in accordance with an approved emission control plan.

(2) For existing engines to be operated under emission compliance limits of subparagraph (c)(2):

(A) By December 31, 1992, submit an emission control plan for Executive Officer approval;

(B) By April 30, 1993, submit applications for permit to construct and permit to operate engines;

(C) By September 30, 1994, initiate control equipment installation; and

(D) By December 31, 1994, have engines and stack modifications, including applicable stack monitoring systems under compliance, in accordance with an approved emission control plan.

(3) For existing engines to be permanently removed from service:

(A) By December 31, 1992, submit a plan for removal of engines from service for Executive Officer approval; and

(B) By December 31, 1999, have all engines removed from service, in accordance with an approved emission control plan.

(4) Notwithstanding the provisions of subparagraphs (c)(1) and (c)(2) of this rule, for engines that were altered to come into compliance with subparagraphs (c)(1) or (c)(2) of Rule 1110.1 by August 3, 1990, or for engines originally installed to effect compliance with and/or meet the limits in subparagraph (c)(1) or (c)(2) of Rule 1110.1 by August 3, 1990:

(A) By December 31, 1999, submit an emission control plan or a plan for compliance with paragraph (c) for Executive Officer approval; and

(B) By December 31, 2004, be in compliance with paragraph (c) of this rule, in accordance with an approved emission control plan.

(5) For existing engines that are required to come into compliance with subparagraphs (c)(1) or (c)(2) of Rule 1110.1 after August 3, 1990 and have not achieved compliance by that date shall in lieu of compliance with Rule 1110.1 comply with paragraphs (c) and (e) of Rule 1110.2 provided that an amended emission control plan is submitted by July 1, 1991.

(6) For portable engines to be operated under emission compliance limits of subparagraph (c)(2):

(A) By December 31, 1997, submit an emission control plan for Executive Officer approval;

(B) By April 30, 1998, submit applications for permit to construct and permit to operate engines;

(C) By September 30, 1999, initiate control equipment installation; and

(D) By December 31, 1999, have engines and stack modifications, including applicable stack monitoring systems, in compliance, in accordance with an approved emission control plan.

(7) Any new engine that is not an existing engine must be in compliance with the provisions of this and other applicable rules before being placed in service.

(f) Monitoring and Recordkeeping

The owner/operator of any engine subject to the provisions of paragraph (c) of this rule shall meet the following requirements:

(1) For stationary engines of 1000 bhp and greater, and operating more than two million bhp-hr per calendar year install, operate and maintain in calibration a continuous in-stack NO_x and CO monitoring system as approved by the Executive Officer to demonstrate compliance within the emission limits of this rule. This system shall include equipment that

measures and records exhaust gas NO_x and CO concentrations, corrected to 15 percent oxygen on a dry basis;

(2) The monitoring system shall have data gathering and retrieval capability approved by the Executive Officer. Data shall be maintained for at least two years and made available for inspection by the Executive Officer or his designee.

(3) Provide source test information regarding the exhaust gas; specifically for NO_x, ROG reported as methane, and CO concentrations (concentrations in ppm by volume, corrected to 15 percent oxygen on dry basis) at least every 12 months.

(4) The owner/operator of any engine shall maintain an engine operating log that includes: on a monthly basis, the total hours of operation; type and quantity of fuel used (liquid/gas); and the cumulative hours of operation since the last source test required in subparagraph (f)(3). This information shall be available for inspection at any time, and submitted to the Deputy Executive Officer/Office of Operations at the end of each calendar year in a manner and form approved by the Executive Officer.

(g) Test Method

The NOx emissions subject to the provisions of this rule shall be determined by the procedure detailed in EPA Test Method 20, the CO emissions by EPA Test Method 10, and the ROG emissions by EPA Test Method 25. Any method deemed to be equivalent and published by the Executive Officer may also be used.

(h) Exemptions

The provisions of paragraphs (c), (d), (e), (f), and (g) shall not apply to:

(1) The operation of any engine during the existence of any officially declared disaster or state of emergency.

(2) Engines used directly and exclusively by the owner/operator for agricultural operations necessary for the growing of crops or raising of fowl or animals.

(3) Emergency standby engines, including portable engines, as approved by the Executive Officer, which operate less than 200 hours per year as determined by an elapsed operating time meter.

(4) Engines used for firefighting and flood control.

(5) Laboratory engines used in research and testing purposes.

(6) Engines operated for purposes of performance verification and testing.

(7) Engines operating in the Riverside County Southeast Desert Air Basin (SEDAB) area within the South Coast Air Quality Management District, but not including the nonattainment Planning Area of the Riverside County SEDAB.

(8) Auxiliary engines used to power other engines or gas turbines during start-ups.

(9) Supplemental engines which operate less than 700 hours per year for the manufacture of snow and/or operation of ski lifts.

(Adopted August 4, 1989)

RULE 1134. EMISSIONS OF OXIDES OF NITROGEN FROM STATIONARY GAS TURBINES

(a) Applicability

The provisions of this rule shall apply to all existing stationary gas turbines, 0.3 megawatt (MW) and larger, as of August 4, 1989.

(b) Definitions

(1) A CHEMICAL PROCESSING GAS TURBINE UNIT is a gas turbine that vents its exhaust gases into the operating stream of a chemical process.

(2) A COGENERATION CYCLE UNIT operates both for the simultaneous production of shaft work and for the recovery of useful thermal energy from the exhaust gases or waste steam as defined by Section 25134 of the California Public Resources Code.

(3) A COMBINED CYCLE UNIT is operated both for the production of electrical energy from shaft work and the useful energy produced from heat recovered from its exhaust gases.

(4) AN EMERGENCY STANDBY UNIT operates only as a mechanical or electrical power source for a facility when the primary power source has been rendered inoperable, except due to power interruption pursuant to an interruptible power supply agreement. This does not include utility company electrical power plant units.

(5) EXHAUST AFTER TREATMENT means a control method for the post-combustion reduction of NO_x emissions, such as selective catalytic reduction.

(6) AN EXISTING UNIT is a stationary gas turbine that prior to August 4, 1989 meets the following criteria:

(A) Has been issued a valid permit to construct or operate by the District, or

(B) Is in operation pursuant to the provisions of District Rule 219(b)(1).

(7) HHV - HIGHER HEATING VALUE OF FUEL.

(8) LHV - LOWER HEATING VALUE OF FUEL.

(9) THE MEASURED NO_x EMISSIONS CONCENTRATION corrected to International Standards Organization (ISO) standard conditions is:

$$NO_x = (NO_x \text{ obs})(\text{Pref}/\text{Pobs})^{0.5} (288\text{K}/\text{Tamb})^{1.53} (e^{19 (\text{Hobs} - 0.00633)})$$

Where:

NO_x	= emissions of NO_x at 15 percent oxygen and ISO standard conditions on a dry basis, ppm.
NO_x obs	= measured NO_x emissions at 15 percent oxygen on a dry basis, ppm.
Pref	= reference ambient absolute pressure, 101.3 kilopascals (14.696 psia).
Pobs	= measured ambient absolute pressure.
Hobs	= measured absolute specific humidity of ambient air, pounds water per pound dry air.
e	= transcendental constant (2.718).
Tamb	= measured temperature of ambient air, degrees K.

(10) A PEAKING UNIT is used intermittently to produce energy on a demand basis.

(11) POWER AUGMENTATION is the increase in the gas turbine shaft output and/or the decrease in gas turbine fuel consumption by the addition of energy recovered from exhaust heat.

(12) THE RATING OF A UNIT is the continuous MW (megawatt) rating or mechanical equivalent by a manufacturer for gas turbine(s) without power augmentation.

(13) A STATIONARY GAS TURBINE (UNIT) is any gas turbine system that is gas and/or liquid fueled with or without power augmentation. This unit is either attached to a foundation at a facility or is portable equipment operated at a specific facility for more than 90 days in any 12-month period. Two or more gas turbines powering one shaft shall be treated as one unit.

(14) THERMAL STABILIZATION PERIOD is the two-hour start up time necessary to build-up steam pressure for NO_x control purposes in cogeneration cycle and combined cycle units.

(c) Emissions Limitations

(1) The owner or operator of any stationary gas turbine unit shall not operate such unit under load conditions, excluding the thermal stabilization period or other time period specified in the Permit to Construct or the Permit to Operate issued prior to August 4, 1989, which result in the discharge of oxides of nitrogen (NO_x) emissions, directly or indirectly, into the atmosphere at concentrations corrected for ISO standard conditions in excess of the following:

$$\text{Compliance Limit} = \text{Reference Limit} \times \frac{\text{EFF}}{25\%}$$

Where:

Compliance Limit = allowable NO_x emissions (ppm by volume).

Reference Limit = the NO_x emission limit (ppm by volume) is calculated at ISO standard conditions, corrected to 15 percent oxygen on a dry basis, and averaged over 15 consecutive minutes. These limits for various megawatt ratings (continuous rating by the manufacturer without power augmentation) are as follows:

REFERENCE NO_x LIMITS, PPM

Unit Size Megawatt Rating (MW)	Effective 12-31-95
0.3 to Less Than 2.9 MW	25
2.9 to Less Than 10.0 MW	9
2.9 to Less Than 10.0 MW No SCR	15
10.0 MW and Over	9
10.0 MW and Over No SCR	12
60 MW and Over Combined Cycle No SCR	15
60 MW and Over Combined Cycle	9

And, $$EFF = \frac{3413 \times 100\%}{\text{Actual Heat Rate at HHV of Fuel (BTU/KW-HR)}}$$

or $$EFF = (\text{Manufacturer's Rated Efficiency at LHV}) \times \frac{LHV}{HHV}$$

EFF = the demonstrated percent efficiency of the gas turbine only as calculated without consideration of any downstream energy recovery from the actual heat rate, (BTU/KW-HR) or 1.34 (BTU/HP-HR); corrected to the HHV (higher heating value) of the fuel and ISO conditions, as measured at peak load for that facility; or the manufacturer's continuous rated percent efficiency (manufacturer's rated efficiency) of the gas turbine after correction from LHV (lower heating value) to the HHV of the fuel, whichever

efficiency is higher. The value of EFF shall not be less than 25 percent. Gas turbines with lower efficiencies will be assigned a 25 percent efficiency for this calculation.

(2) The owner or operator of any existing gas turbine subject to this rule shall also be subject to Regulation XIII if carbon monoxide emissions increase as a result of the application of NO_x controls.

(d) Compliance Schedule

Owners or operators of all existing gas turbine units shall comply with the provisions of section (c) in accordance with the following schedule:

(1) For units 0.3 to less than 2.9 MW.

(A) By December 31, 1993 submit to the Executive Officer for approval an emission control plan of actions and alternatives which will be taken to demonstrate compliance.

(B) Demonstrate final compliance with the 25 ppm reference limit by December 31, 1995.

(2) For units 2.9 to less than 10.0 MW.

(A) By December 31, 1993 elect reference emission limit and submit to the Executive Officer for approval an emission control plan of actions and alternatives which will be taken to demonstrate compliance with this limit.

(B) Demonstrate final compliance with the elected reference emission limit by December 31, 1995.

(C) If compliance with the elected 15 ppm reference emission limit is not demonstrated by December 31, 1995, the reference emission limit shall be 9 ppm.

(3) For units 10.0 MW and over.

(A) The owners or operators of the following units or equivalent gas turbines units as approved by the Executive Officer shall install steam injection on the specified units demonstrating compliance with a reference limit of 15 ppm NO_x at 15 percent O_2.

(i) By December 31, 1989, submit an Emission Control Plan and a permit to construct for a GE LM-5000 to demonstrate compliance by December 31, 1990.

(ii) By December 31, 1989, submit an Emission Control Plan and a permit to construct for a GE LM-2500 to demonstrate compliance by December 30, 1991.

(B) By December 31, 1992, submit to the Executive Officer for approval an Emission Control Plan of actions and alternatives which will be taken to demonstrate compliance.

(C) Demonstrate final compliance with the appropriate emission limit in section (c)(1) by December 31, 1995.

(D) If compliance with the elected 12 ppm reference emission limit is not demonstrated by December 31, 1995 the reference emission limit shall be 9 ppm.

(E) If there is a failure to comply with any of the increments of progress specified in subsections (d)(3)(A)(i) or (d)(3)(A)(ii), the final reference NO_x limit for all 10 MW and greater units shall be a reference limit of 9 ppm.

(i) By August 1, 1992, the owners or operators of all 10 MW and greater units shall submit to the Executive Officer for approval Emission Control Plans.

(ii) The final compliance date for all 10 MW and greater units with the reference 9 ppm NO_x limit shall be August 1, 1993.

(F) Any unit which demonstrates early compliance with the specific final reference limit specified in subsection (c)(1) by February 1, 1992 shall remain subject to such reference limit and shall not be subject to any changed reference limit set forth in subsection (d)(3).

(G) In order to encourage the efficient production of electrical energy and the conservation of natural resources, any turbine that is operated to support the recycling and remanufacturing of paper products and that is at least fifteen years old on August 4, 1989 may comply with the following schedule.

By December 31, 1993:

(i) submit a plan to the Executive Officer for approval that commits to repowering or replacement of its existing unit by December 31, 1999 with a unit that is more energy

efficient than the current unit and satisfies the BACT requirements of Regulation XIII at the time of permit application, or

(ii) submit a permit to construct for modifications of the existing unit to comply by December 31, 1995 with the final reference limit specified in subsection (c)(1).

(4) For units 60 MW and over combined cycle.

(A) By December 31, 1992 elect reference emission limit and submit to the Executive Officer for approval an emission control plan of actions and alternatives which will be taken to demonstrate compliance with this limit.

(B) Demonstrate final compliance with the elected reference limit by December 31, 1995.

(C) If compliance with the elected 15 ppm reference emission limit is not demonstrated by December 31, 1995 the reference emission limit shall be 9 ppm.

(e) Emission Control Plan

The owner or operator of any existing stationary gas turbine shall submit to the Executive Officer for approval an Emissions Control Plan of all actions and alternatives, including a schedule of increments of progress, which will be taken to meet or exceed requirements of the applicable emissions limitations in section (c) and compliance schedule in section (d).

(1) Such plan shall contain at a minimum a list that provides the following for each gas turbine:

(A) SCAQMD permit or identification number,

(B) name of gas turbine manufacturer,

(C) model designation,

(D) rated brake horsepower,

(E) heat rate (BTU/KW-HR), corrected to the HHV for each type of fueling (liquid/gas),

(F) type of liquid fuel and/or type of gaseous fuel,

(G) hours of operation in the previous one-year period, and

(H) fuel consumption (cubic feet of gas or gallons of liquid) for the previous one-year period.

(2) A list of all gas turbines required to be controlled identifying the type of emission control to be applied to such gas turbines along with documentation showing existing emissions of oxides of nitrogen and carbon monoxide.

(3) Support documentation for any units exempt under the provisions of section (g).

(f) Continuous Emissions Monitoring System

The owner or operator of any stationary gas turbine subject to the provisions of this rule shall perform the following actions:

(1) Install, operate, and maintain in calibration a continuous in-stack NO_x monitoring system as approved by the Executive Officer to demonstrate compliance with the emission limits of this rule. This system shall include equipment that measures and records the following:

(A) For Cogeneration and Combined Cycle Units 2.9 MW and over (continuous rating by the manufacturer without power augmentation), exhaust gas NO_x concentrations corrected to ISO conditions at 15 percent oxygen on a dry basis at the time units that are subject to the applicable 9 ppm, 12 ppm, 15 ppm or 25 ppm reference NO_x limit.

(B) Flow rate of liquids or gases and the ratio of water or steam to fuel added to the combustion chamber or to the exhaust for the reduction of NO_x emissions.

(C) Elapsed time of operation.

(2) The system shall have data gathering and retrieval capability as approved by the Executive Officer. Data shall be maintained for at least two years and made available for inspection by the Executive Officer. A monthly summary of emissions shall be submitted on or before the last day of the following calendar month in a manner approved by the Executive Officer.

(3) Provide source test information regarding the exhaust gas NO_x concentration at ISO conditions, and the demonstrated percent efficiency (EFF) of the turbine unit, and the carbon monoxide concentration

(concentrations in ppm by volume, corrected to 15 percent oxygen on a dry basis).

Units emitting 25 tons or more of NO_x per calendar year shall be tested, at least once every 12 months. All other existing units shall be tested within 90 days after every 8,400 hours of operation. The results of source tests shall be submitted in a form and manner as specified by the Executive Officer within 30 days after testing is completed.

(4) The owner or operator of any stationary gas turbine must maintain a gas turbine operating log that includes, on a daily basis, the actual Pacific Standard Time start-up and stop time, total hours of operation; type and quantity of fuel used (liquid/gas), cumulative hours of operation to date for the calendar year; and cumulative hours of operation since the last source test required by subsection (f)(3). This information shall be available for inspection at any time and submitted to the Executive Officer at the end of each calendar year in a manner and form approved by the Executive Officer.

(g) Exemptions

(1) Provisions of sections (c), (d), (e), and (f) shall not apply to:

(A) Laboratory units used in research and testing.

(B) Units operated exclusively for firefighting and/or flood control.

(C) Chemical processing gas turbine units.

(D) Emergency standby units demonstrated to operate less than 200 hours per calendar year.

(2) Peaking Units

(A) Provisions of sections (c), (d), (e), and (f) shall not apply to existing peaking units that operate less than 200 hours per calendar year. The operating time shall be recorded by instrumentation as approved by the Executive Officer.

(B) The owner or operator of any stationary gas turbine exempt under subsection (g)(2) must notify the Executive Officer within 7 days if the hour-per-year limit is exceeded. If the hour-per-year limit is exceeded, the exemption shall be permanently withdrawn.

Within 30 days after loss of the exemption, the owner or operator must submit a permit application detailing a plan to meet the applicable compliance limit within 24 months. Included with this permit application, the owner or operator must submit an emission control plan including a schedule of increments of progress for the installation of the required control equipment. This schedule shall be subject to the review and approval of the Executive Officer.

Appendix F
OCSINV Users Guide and Disk

GM-012-91

OCSINV USER'S GUIDE

(software version 1.0)

JUNE 1991

TABLE OF CONTENTS

1
PRELIMINARIES

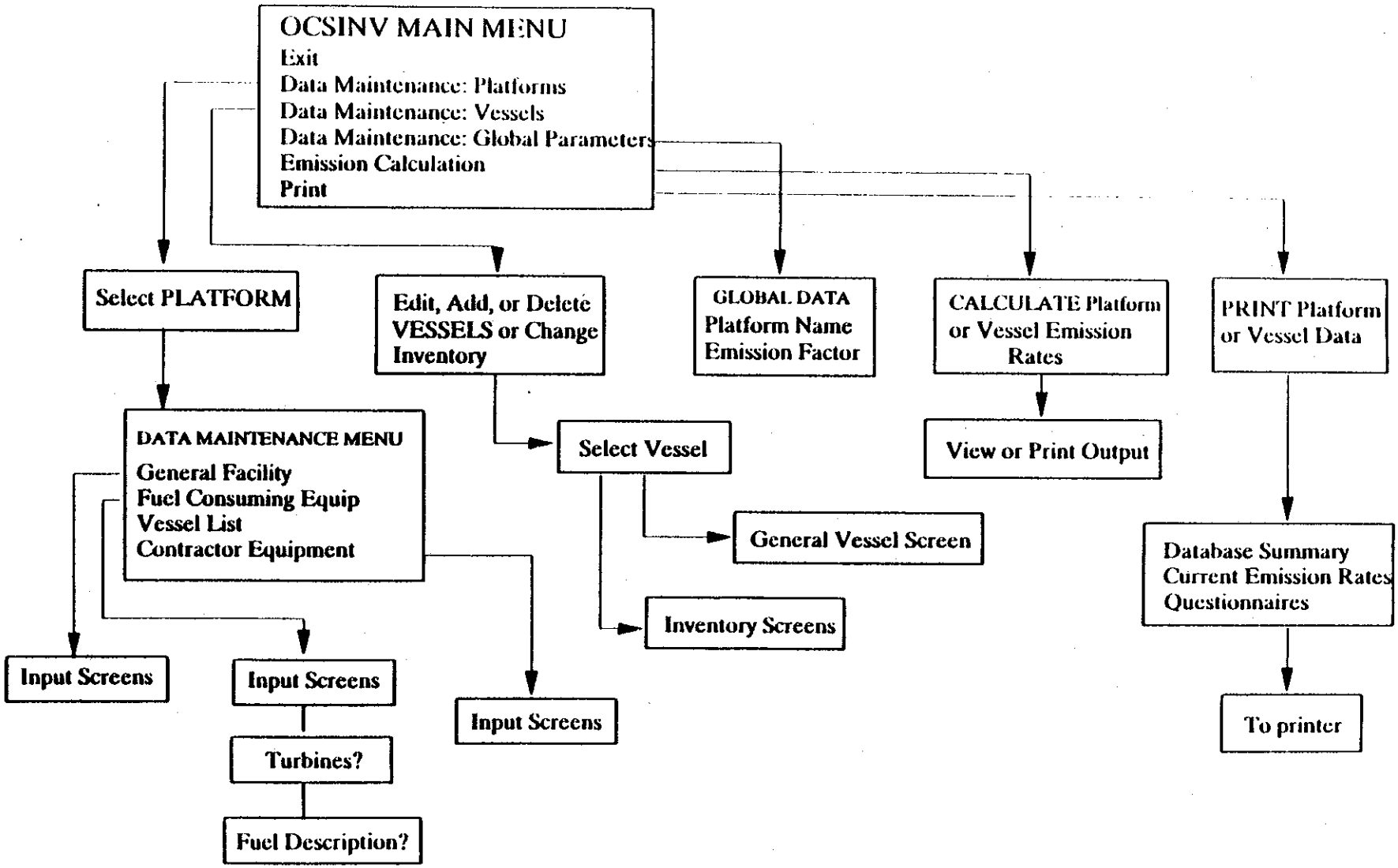
1.1 INTRODUCTION

The OCS Inventory System (OCSINV) was developed to aid in the data management task during the first phase of the examination of Reasonably Available Control Technology (RACT) for offshore platforms. Thus, this system has some specialized features that were specifically designed for prioritizing emission sources for RACT. Under this study, we acquired 5 years of historical operating parameters from offshore platforms in the Southern California region. After this data was entered into our database, the first use of the OCSINV system was to prepare questionnaires that presented the data that we already had acquired. In this way, the platform operators could actually examine and/or correct the data we did have while supplying any missing data. After the data gathering and data entry efforts were completed, we added a master table of emission factors to OCSINV. The system uses these factors to generate the final summary tables of emission rates for each piece of equipment on each platform.

Because the ultimate objective of the RACT study was the generation of annual emission rates for a specific period of years, the OCSINV system has limits to its applicability. It does, however, include a full database of operating parameters for 1985 to 1990. With its user-friendly menus and input forms, you can readily examine data on an equipment-by-equipment basis. Ultimately, the OCSINV system can serve as a core for a more advanced system that would accommodate more generalized applications as they develop. The following sections briefly describe how to operate the OCSINV system.

1.2 FLOW CHART

The following figure presents a stylized flow chart of the main OCSINV menu items. From the Main Menu, you can access the platform database, vessel database, or global parameters (list of platforms or emission factors). Options are also included for calculating and printing the emission rates.


OCSINV MAIN MENU
Exit
Data Maintenance: Platforms
Data Maintenance: Vessels
Data Maintenance: Global Parameters
Emission Calculation
Print
Select PLATFORM
Edit, Add, or Delete VESSELS or Change Inventory
GLOBAL DATA
Platform Name
Emission Factor
CALCULATE Platform or Vessel Emission Rates
PRINT Platform or Vessel Data
DATA MAINTENANCE MENU
General Facility
Fuel Consuming Equip
Vessel List
Contractor Equipment
Select Vessel
View or Print Output
General Vessel Screen
Inventory Screens
Database Summary
Current Emission Rates
Questionnaires
Input Screens
Input Screens
Input Screens
Turbines?
Fuel Description?
To printer

1.3 INSTALLATION

OCSINV was developed for use with dBASE IV+, version 1.1. Note that the dBASE version number is important, since we have utilized specific features of the newer version. Two categories of files have been included. The first category of files are all compiled programs, databases, and indices that you need to run OCSINV. Also included is a category of files that a dBASE programmer would need to make changes to OCSINV. In other words, if you are only planning to run OCSINV without accessing the uncompiled code, you will only need to do the first installation. If you would like to access the OCSINV source code, complete both installations.

We are assuming that the dBASE IV+ version 1.1 software is already installed on your system and that the **PATH** statement in your AUTOEXEC.bat file includes the path to the subdirectory where the dBASE files are stored. For example, if your dBASE files are stored in a subdirectory name DBASE4 on drive C, the path statement should contain (at a minimum):

PATH=C:\DBASE4

This statement will allow you to start-up dBASE from any sub-directory where you store your OCSINV files.

1.3.1 INSTALLATION OF THE RUN-TIME FILES ONLY

These are the steps to install the run-time OCSINV files onto your hard disk. Note that if you wish to run the program from a floppy drive, refer to the start-up procedures in section 1.4.

Step 1: Place the OCSINV floppy in drive A:

Step 2: From DOS, make a subdirectory for the OCSINV files

C:\>**MKDIROCSINV**

Step 3: Change the default to this new directory

C:\ > **CD OCSINV**

Step 4: Copy the files

C:\OCSINV > **COPY A: .**

1.3.2 INSTALLATION OF THE SOURCE CODE FILES

To install the OCSINV source code files in addition to the compiled versions of the files, complete the following steps:

Step 1: Place the OCSINV floppy in drive A:

Step 2: Assign the existing OCSINV subdirectory as the default directory

C:\ > **CD OCSINV**

Step 3: Copy the source files from the source file subdirectory from drive A:

C:\OCSINV > **COPY A:\SRCFILES\ .**

1.4 START-UP

After you have installed the OCSINV files onto your hard disk, you can start-up the program by invoking both dBASE and the OCSINV program at the same time.

C:\OCSINV > **DBASE OCSINV**

If you want to run the program from a floppy drive, you must first start-up dBASE. Then, you can specify the default drive so that the dBASE program will know where to search for files.

Step 1: Start-up dBASE

C:\ > **DBASE**

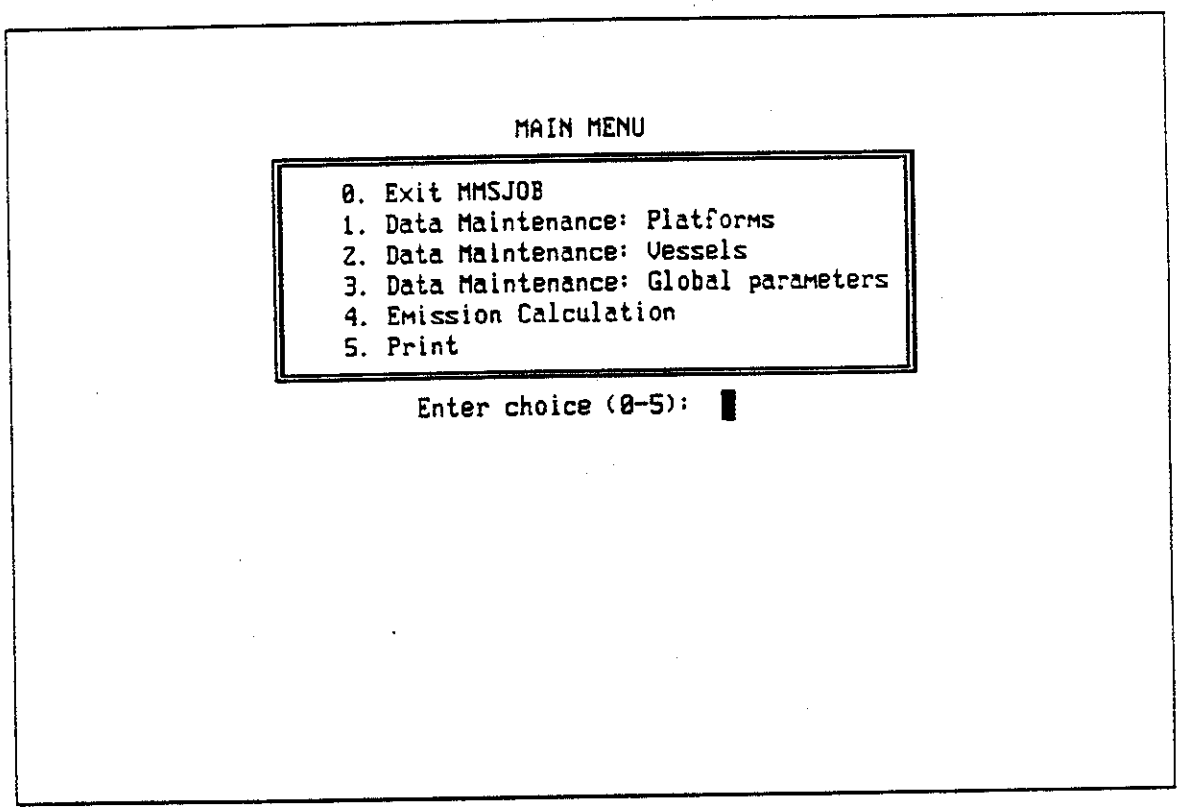
Step 2: At the dot prompt, set the default path

.SET DEFAULT TO A:

Step 3: Start the OCSINV program

.DO OCSINV

From either start-up method, the following OCSINV main menu will appear.

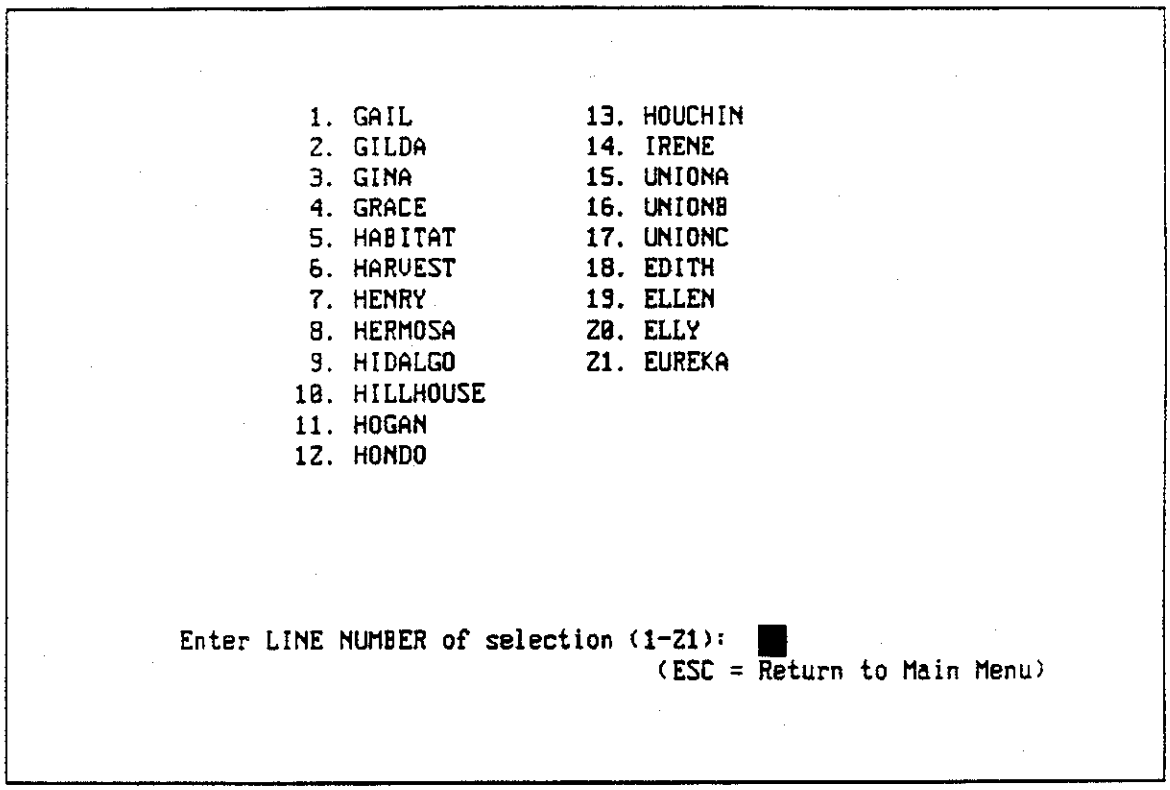


2

PLATFORM DATA MAINTENANCE

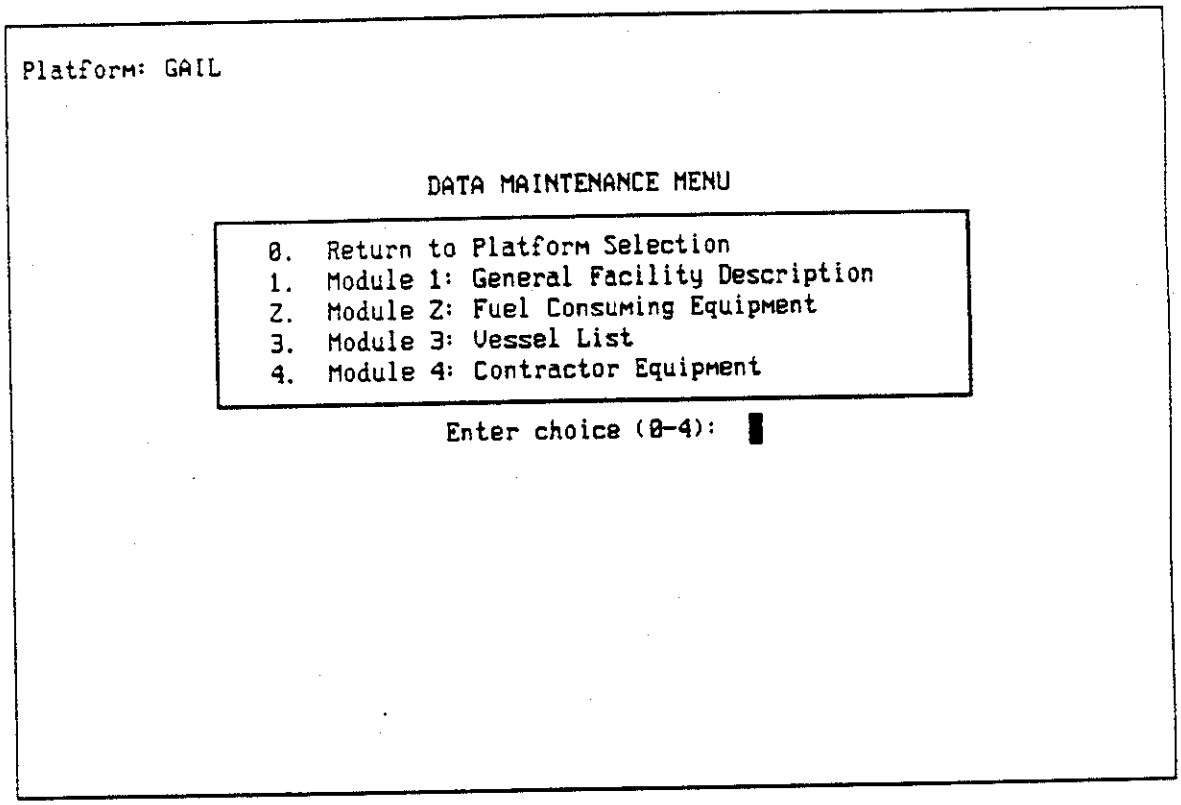
2.1 DESCRIPTION

Option #1 from the OCSINV Main Menu will allow you to access the platform-by-platform inventory of all equipment. You will first be asked to specify the platform name as shown below. Enter the number of your choice and press **[ENTER]**.



2.2 DATA MAINTENANCE MENU

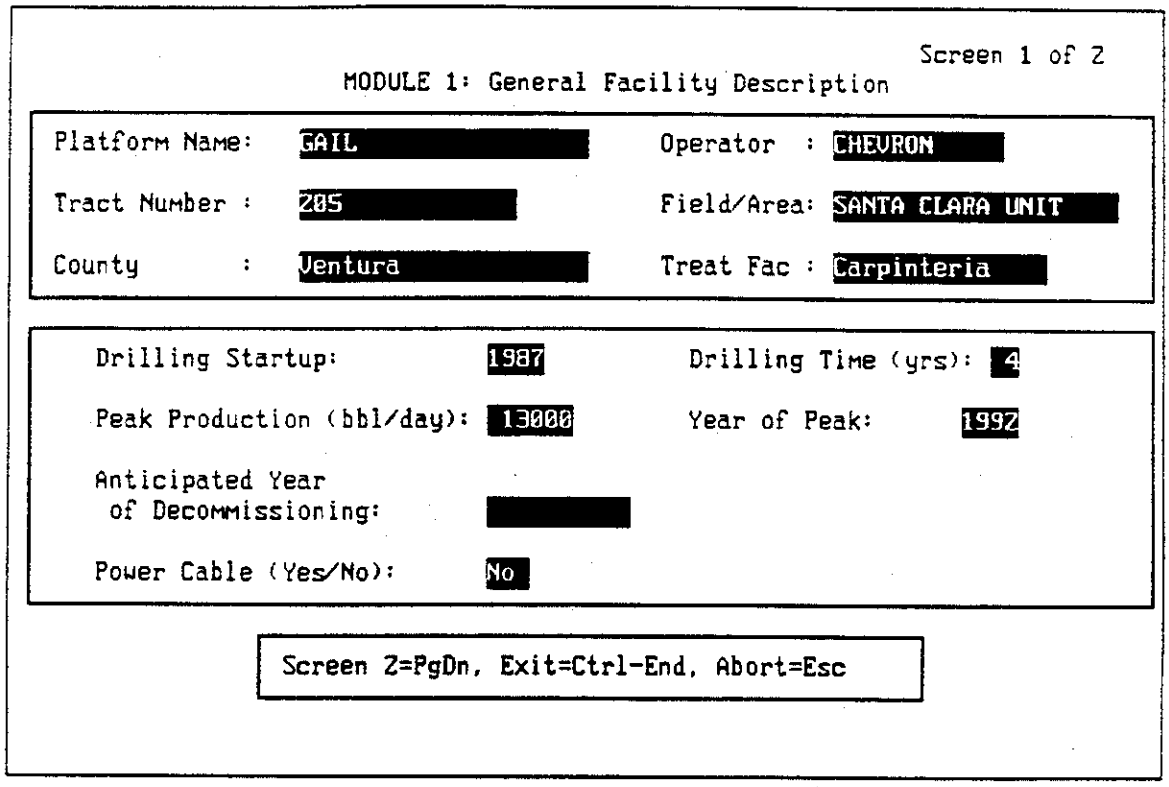
The Data Maintenance Menu for platforms is shown below. It is separated into four modules--general facility information, fuel consuming equipment, vessel list, and contractor equipment. Note that the vessel list option is only a list of support vessels that are associated with the selected platform. To actually edit vessel information, go back to the Main Menu and select option #2.

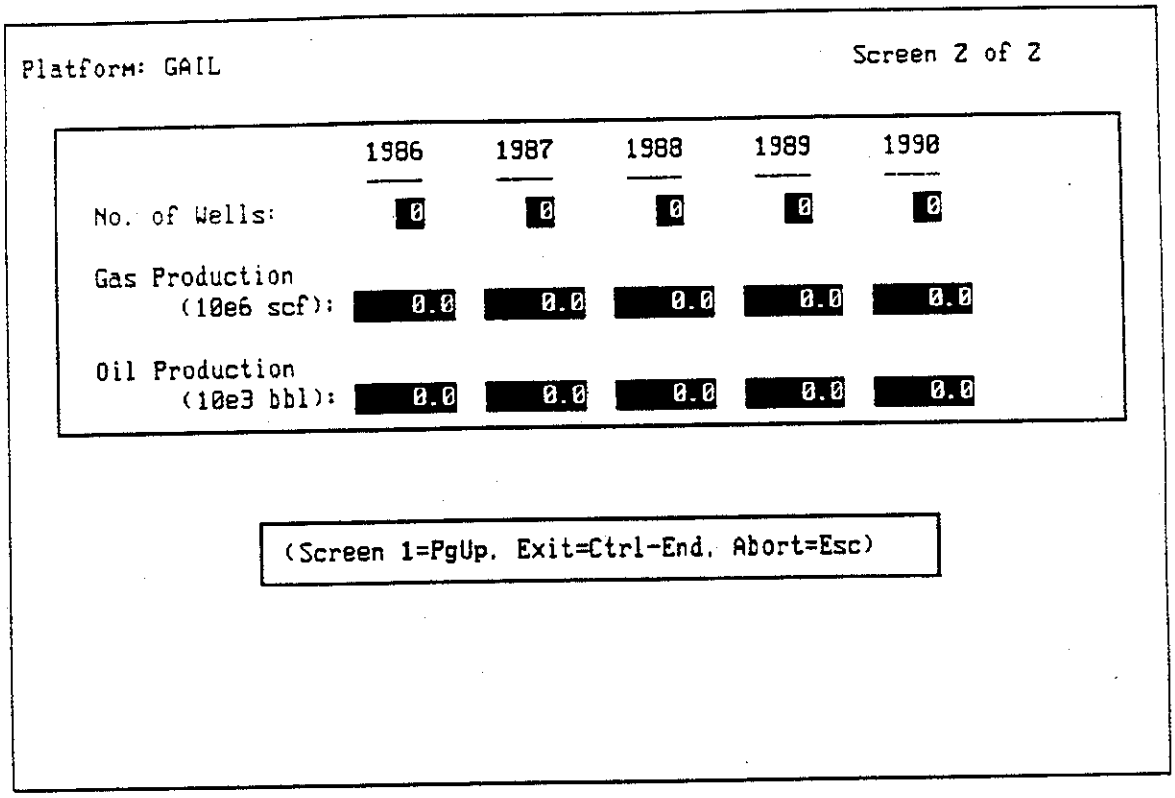


2.2.1 GENERAL FACILITY DESCRIPTION SCREENS

The two general information screens for this data maintenance option contain general information like operator name, tract number, drilling startup, number of wells, etc. Examples of these two screens are shown on the following pages. Note that the **[PgUp]** and **[PgDn]** keys can be used to jump from one screen to another. The **[ENTER]** or **[TAB]** keys will hop forward from one entry field to another; **[SHIFT][TAB]** will hop backwards

from one entry field to the previous one. When you have completed your entries, press [CTRL][END] to save your changes or [ESC] to abort.

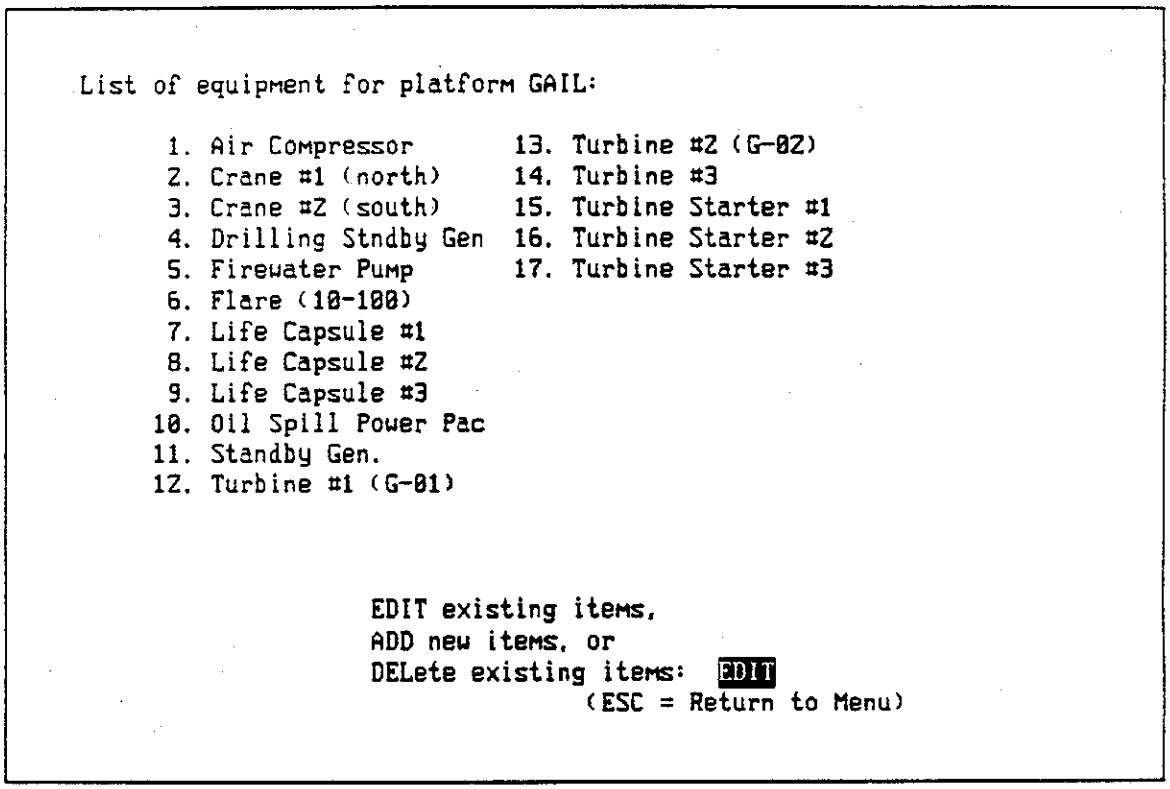




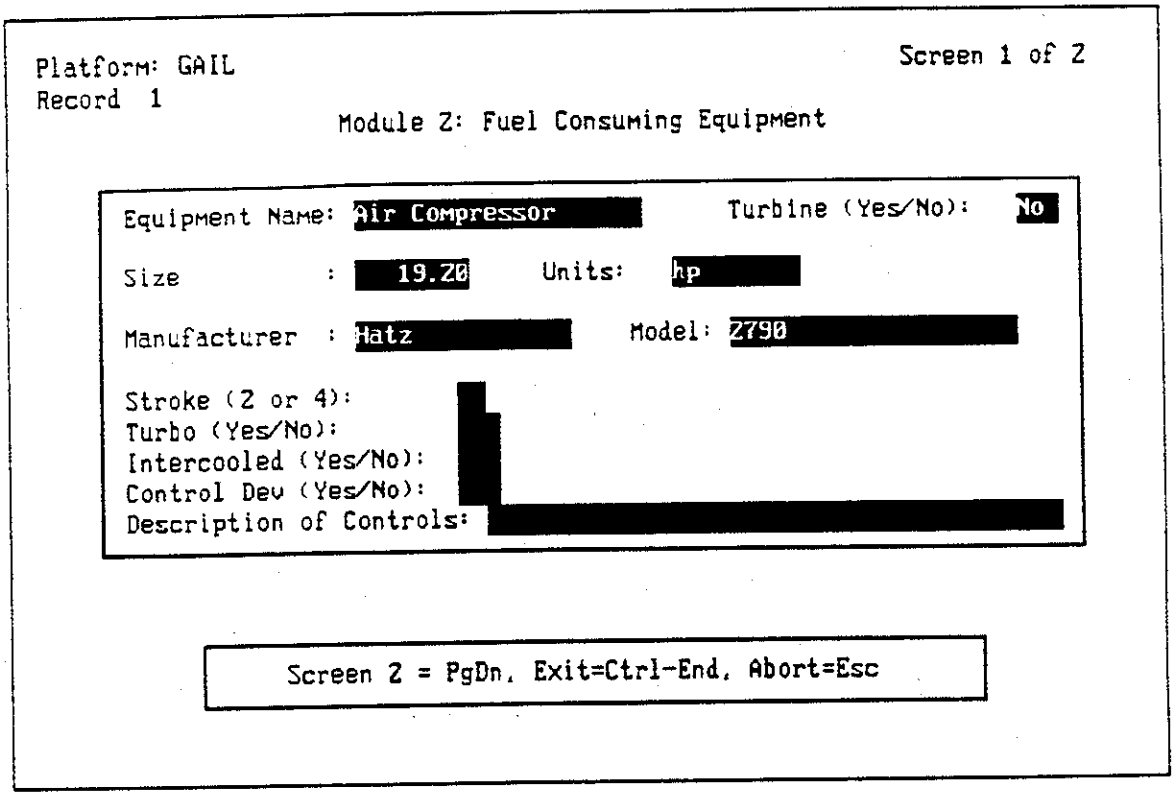
NOTE: If you are positioned on the second screen, pressing **[PgDn]** will also save your changes and exit. On any input screen, pressing **[ENTER]** with your cursor on the last input field will also take you to the next screen (or out of the input screens, if you are positioned on the last screen).

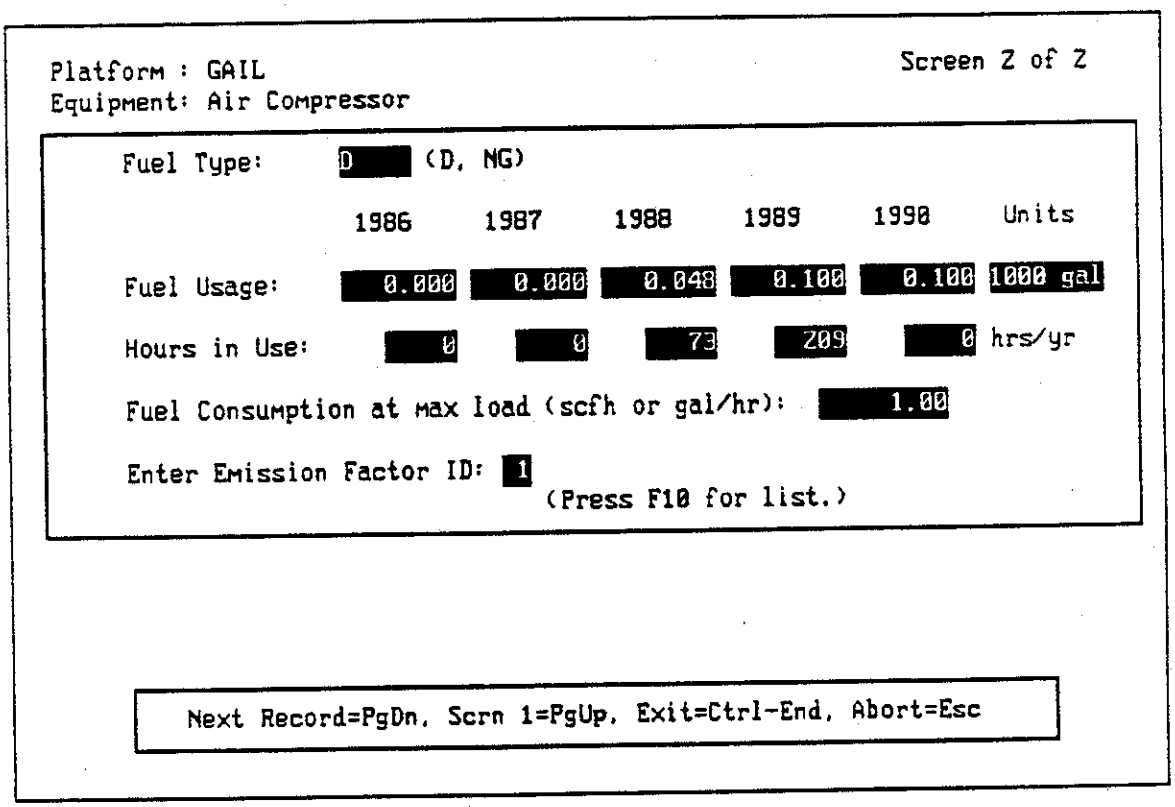
2.2.2 FUEL CONSUMING EQUIPMENT

The figure below shows an example list of equipment that appears when you choose to access the fuel consuming module from the Data Maintenance Menu. This equipment list is platform-specific, i.e., it only lists the equipment that is currently entered in the database for the selected platform. From this screen, you can EDIT, ADD, or DELete files. To select one of these options, press E, A, or D, respectively, and then press **[ENTER]**. Pressing **[ESC]** will return you to the Data Maintenance Menu.

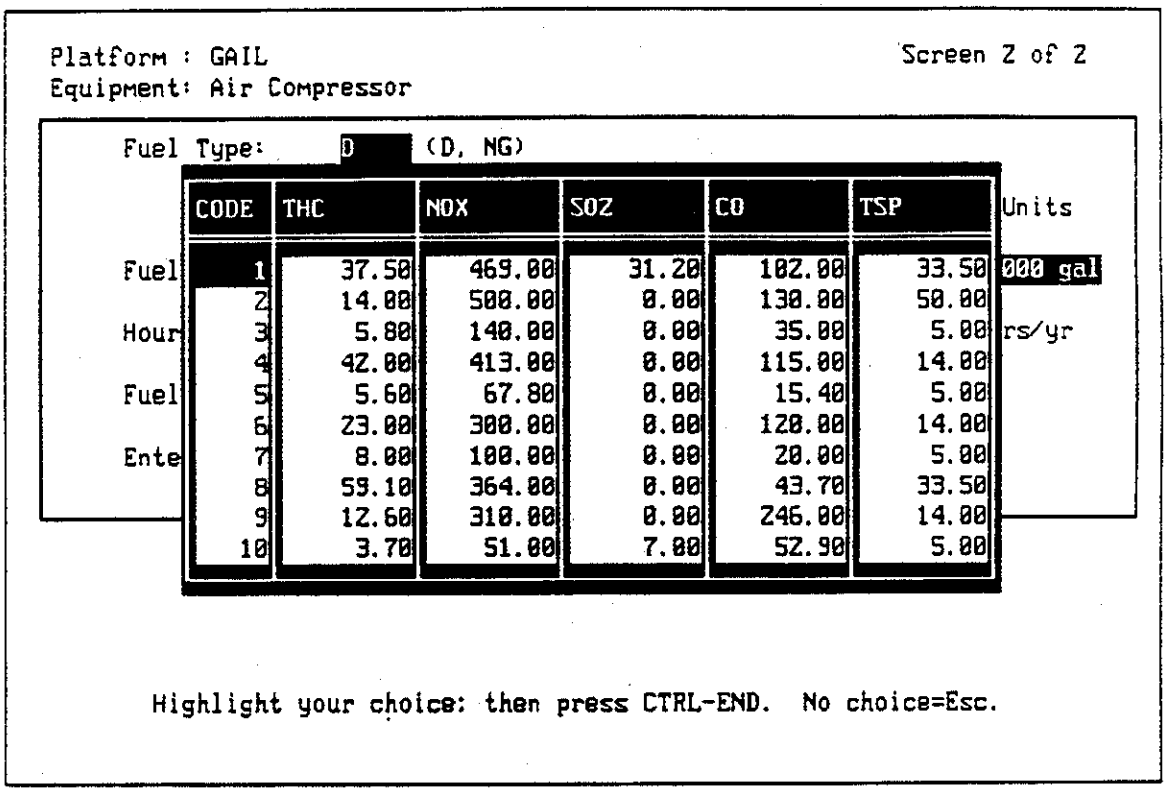


If you choose the Edit option, screens like the following two examples will appear. Two screens are associated with each equipment item. The first screen contains general operating parameters; the second screen contains more specific input items like fuel use by year. Note that you can readily cycle through the screens by pressing **[PgDn]**.

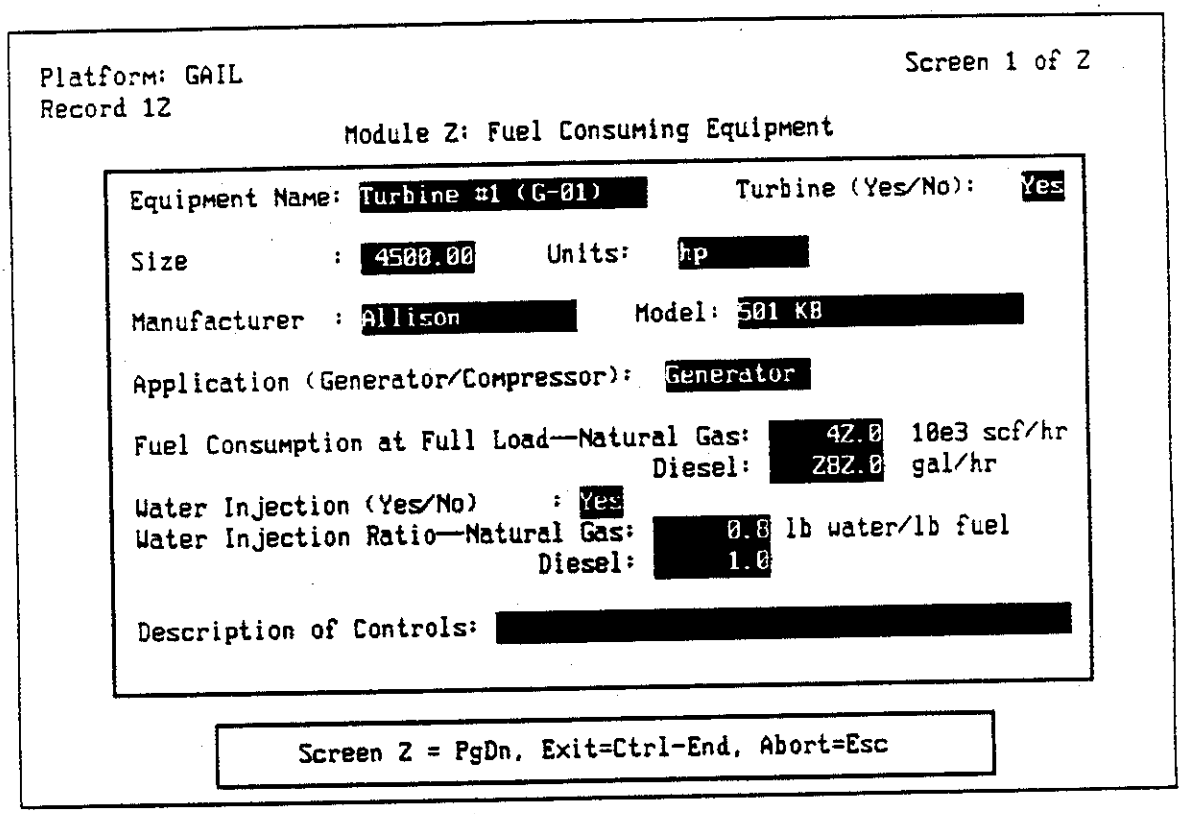

Platform: GAIL
Record 1
Screen 1 of 2
Module 2: Fuel Consuming Equipment
Equipment Name: Air Compressor
Turbine (Yes/No): No
Size : 19.20
Units: hp
Manufacturer : Hatz
Model: 2790
Stroke (2 or 4):
Turbo (Yes/No):
Intercooled (Yes/No):
Control Dev (Yes/No):
Description of Controls:
Screen 2 = PgDn, Exit=Ctrl-End, Abort=Esc

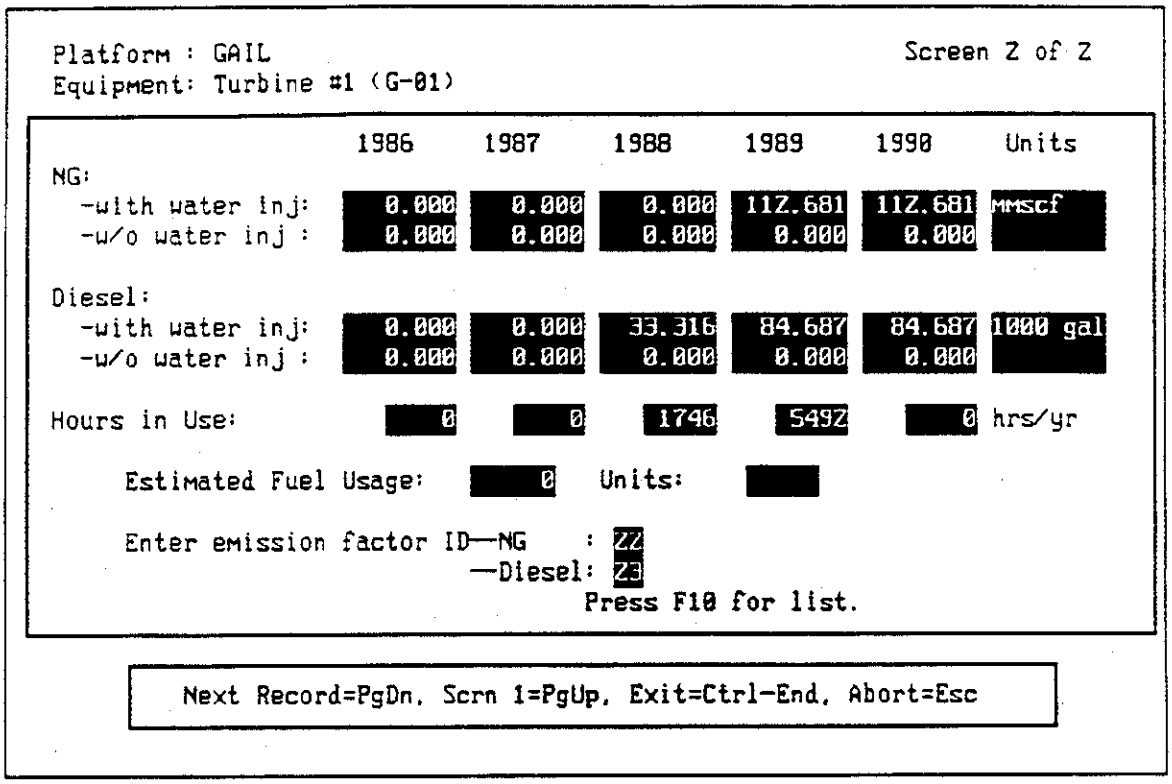

Platform : GAIL
Equipment: Air Compressor
Screen 2 of 2
Fuel Type: D (D, NG)
1986 1987 1988 1989 1990 Units
Fuel Usage: 0.000 0.000 0.048 0.100 0.100 1000 gal
Hours in Use: 0 0 73 209 0 hrs/yr
Fuel Consumption at max load (scfh or gal/hr): 1.00
Enter Emission Factor ID: 1
(Press F10 for list.)
Next Record=PgDn, Scrn 1=PgUp, Exit=Ctrl-End, Abort=Esc

On the second screen (see bottom figure on previous page), note that there is an field for entering a emission factor ID. As a feature of OCSINV, you can use a pop-up list of available emission factors to help you fill this entry. With your cursor on this field, press **[F10]**. The following screen will appear. Use the arrow keys to highlight your choice. Then, press **[ENTER]** and the factor code that you selected will be automatically entered onto the equipment input screen. Press **[ESC]** to exit without selecting.

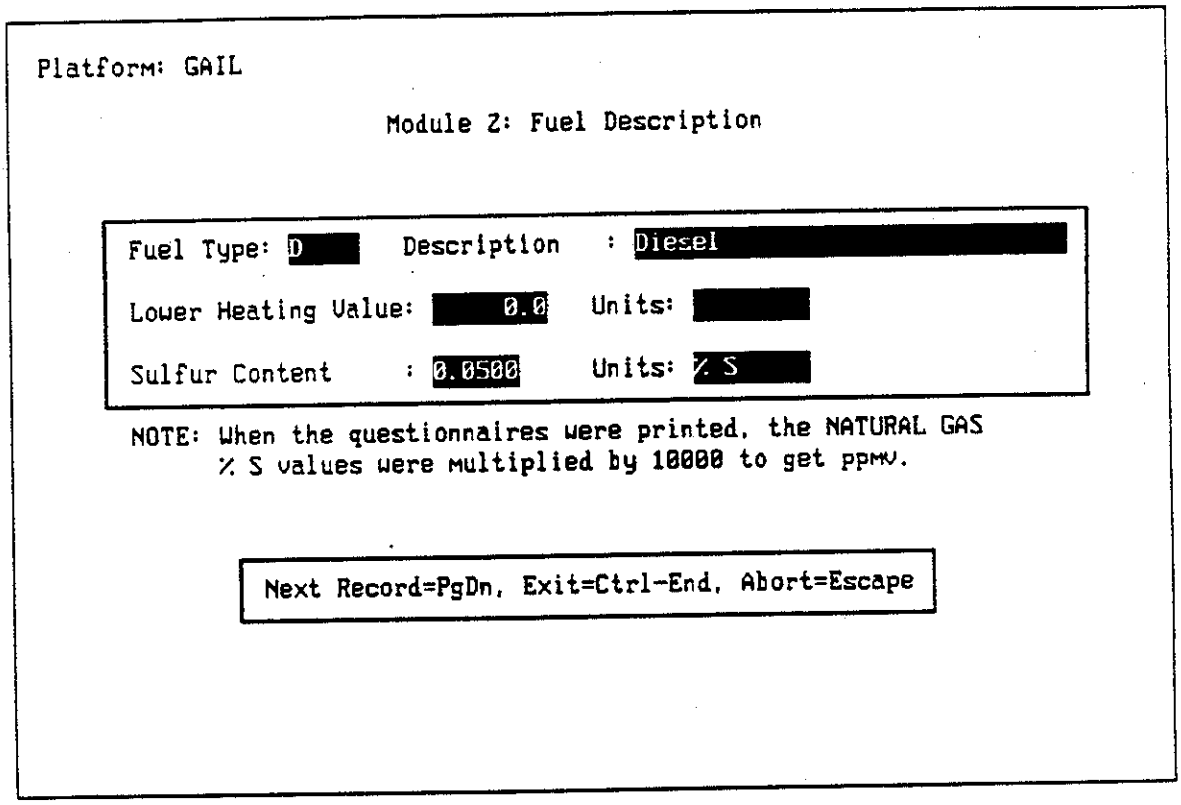


The turbine equipment is treated separately. After you have cycled through the non-turbine equipment, you will be asked if you want to continue on to the turbine records. (If the platform you are examining does not have any turbine equipment, this question will be skipped.) If you select **Y** (for Yes), two input screens for each turbine will appear. Examples of these two screens are shown below. Like the fuel consuming equipment screens, use the **[F10]** key to pop-up a window with emission factor ID choices when your cursor is in this input field. For turbines, you can enter one factor for natural gas and one for diesel.



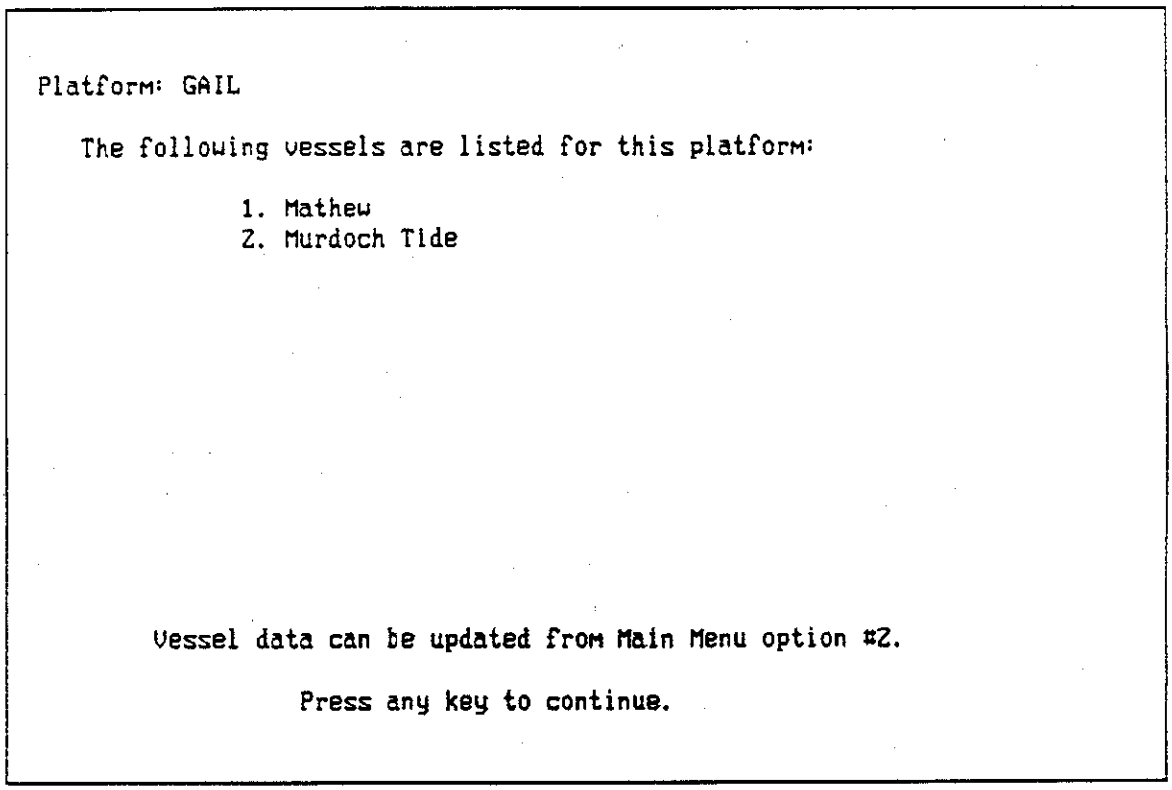

Platform : GAIL
Screen Z of Z
Equipment: Turbine #1 (G-01)
1986 1987 1988 1989 1990 Units
NG:
-with water inj: 0.000 0.000 0.000 112.681 112.681 MMscf
-w/o water inj : 0.000 0.000 0.000 0.000 0.000
Diesel:
-with water inj: 0.000 0.000 33.316 84.687 84.687 1000 gal
-w/o water inj : 0.000 0.000 0.000 0.000 0.000
Hours in Use: 0 0 1746 5492 0 hrs/yr
Estimated Fuel Usage: 0 Units:
Enter emission factor ID—NG : ZZ
—Diesel: Z3
Press F10 for list.
Next Record=PgDn, Scrn 1=PgUp, Exit=Ctrl-End, Abort=Esc

Next, you will be asked if you want to continue to the fuel description records. If you enter **Y** (for Yes), the following screen will appear. As a minimum, enter a unique fuel type and percent sulfur for each fuel record. When examining the fuel types for the summary tables we prepared, we noticed that parameters like the sulfur content of natural gas may vary at the same facility. To accommodate this, make the fuel name unique, e.g., NG1, NG2, NG3. When you enter the fuel type for the individual pieces of equipment, enter the fuel type with the corresponding, unique designation. Note that there are a few special cases coded into the OCSINV program to account for cases where the sulfur content varied by year--see the subroutine named **Calcon.prg**.



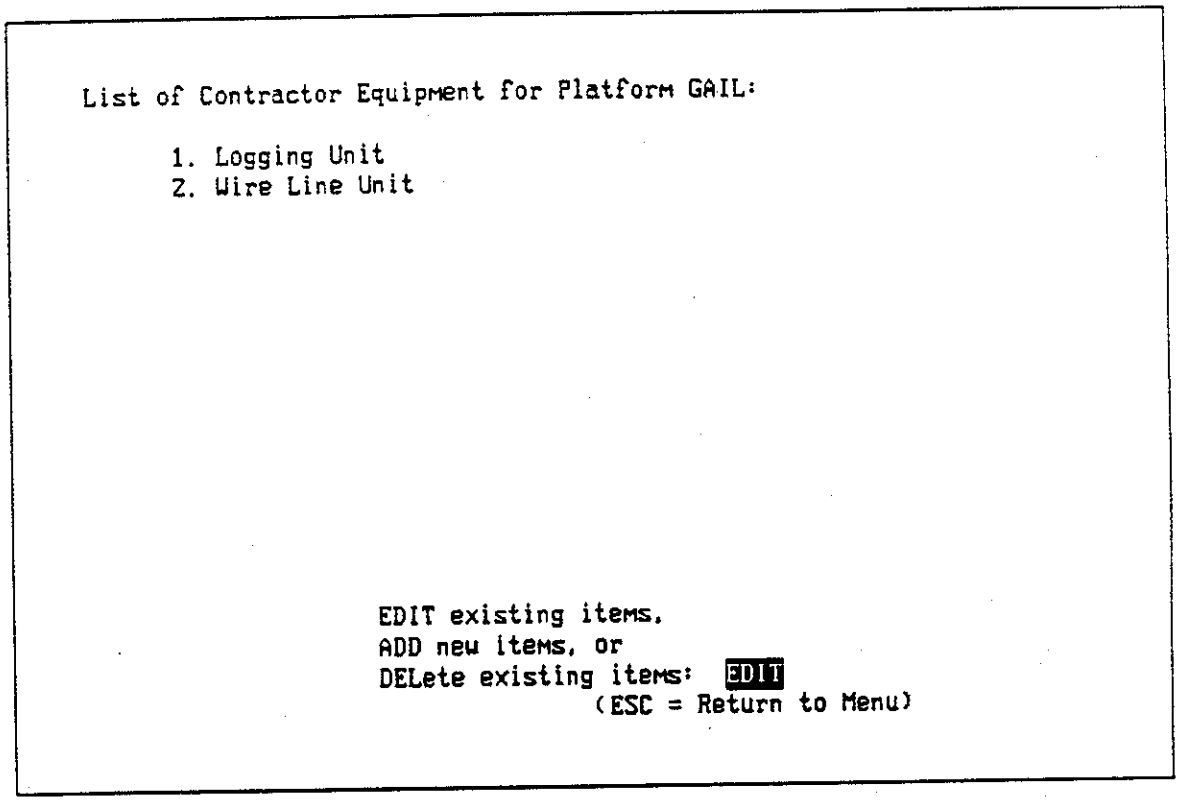
2.2.3 VESSEL LIST

Originally, the vessels were organized by platform. After analyzing the vessel data, we reorganized this data by vessel. However, this option from the data maintenance menu will allow you to see a list of the vessels associated with the selected platform. Choose option 2 from the Main Menu to actually edit the vessel data.

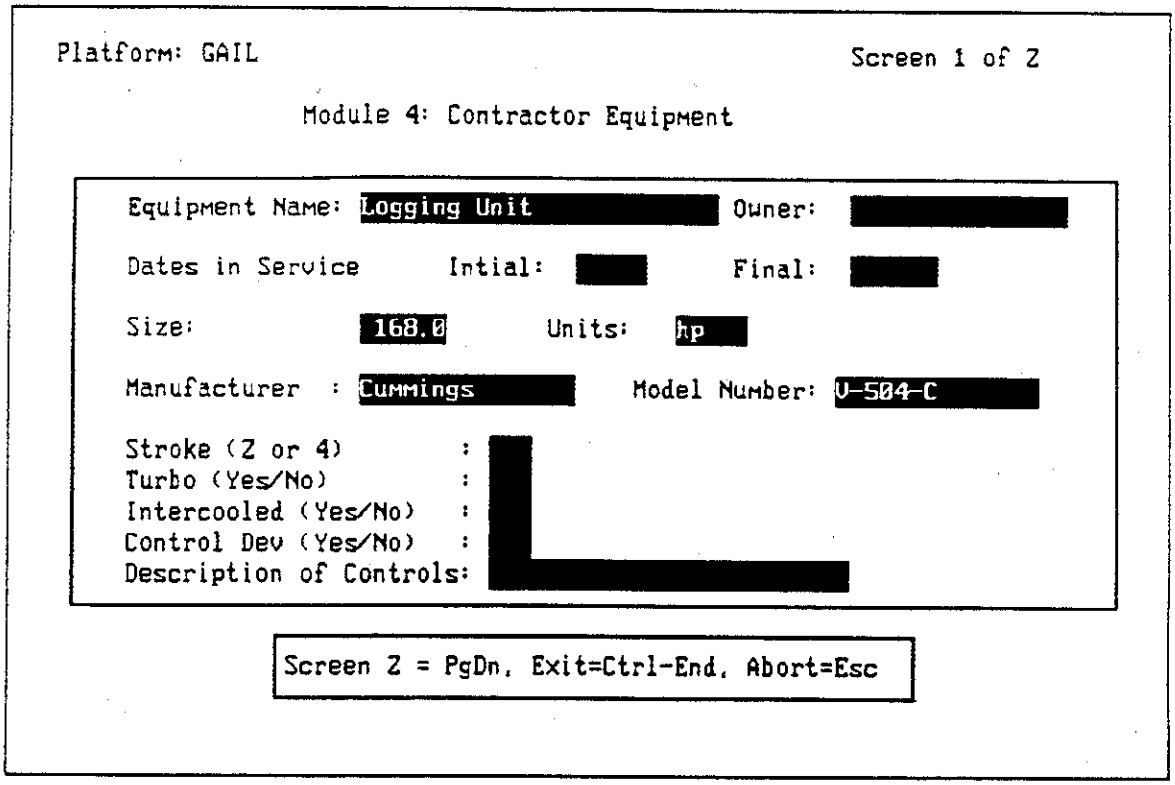


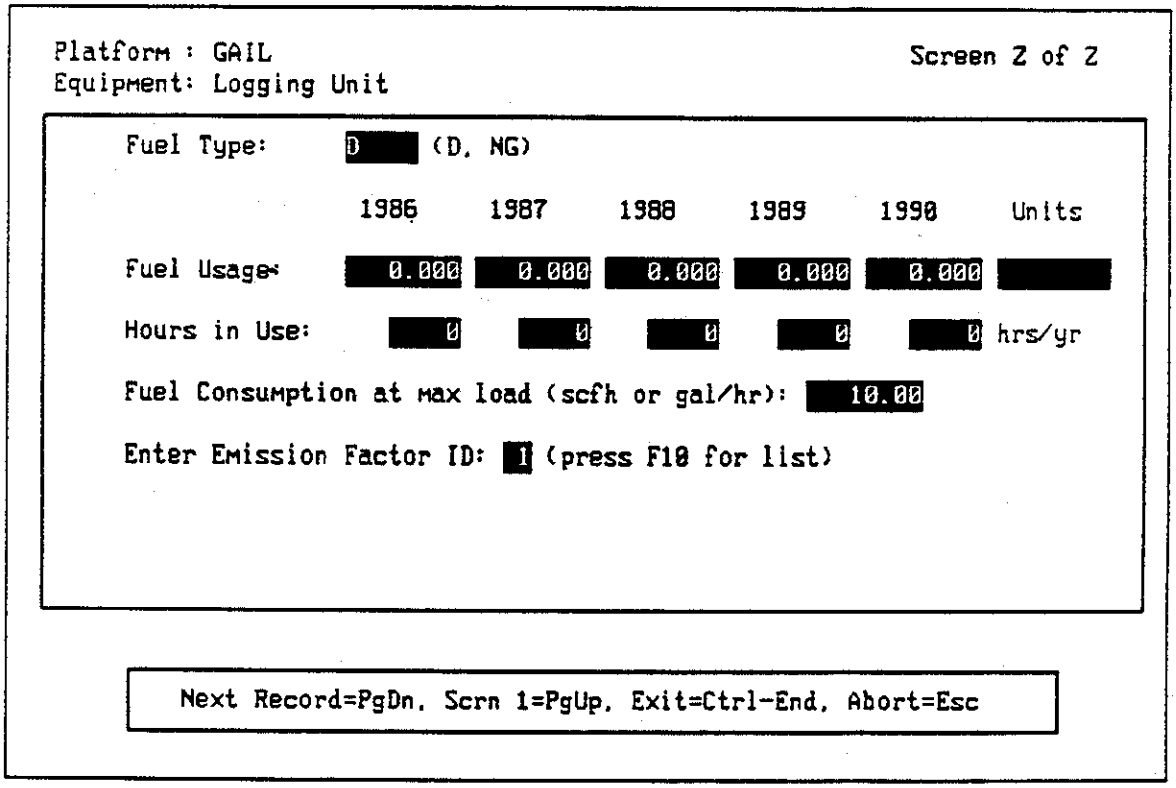
2.2.4 CONTRACTOR DATA

Option 4 from the Data Maintenance Menu will access the contractor data records, if any. As shown below, you must first choose whether you want to EDIT, ADD, or DELete equipment by pressing the first letter of your choice and pressing **[ENTER]**.



The examples below show the 2 screens that are associated with each piece of contractor equipment if you choose to add to edit records. These screens are similar to the data entry screens for the fuel-consuming equipment. After you have cycled through the screens or pressed **[CTRL][END]**, you will be asked if you want to access the fuel description records. These records are the same as the fuel records for the fuel-consuming equipment, i.e., the contractor fuel descriptions are not stored separately.


Platform: GAIL
Screen 1 of 2
Module 4: Contractor Equipment
Equipment Name: Logging Unit
Owner:
Dates in Service
Intial:
Final:
Size: 168.0
Units: hp
Manufacturer : Cummings
Model Number: V-504-C
Stroke (2 or 4) :
Turbo (Yes/No) :
Intercooled (Yes/No) :
Control Dev (Yes/No) :
Description of Controls:
Screen 2 = PgDn, Exit=Ctrl-End, Abort=Esc

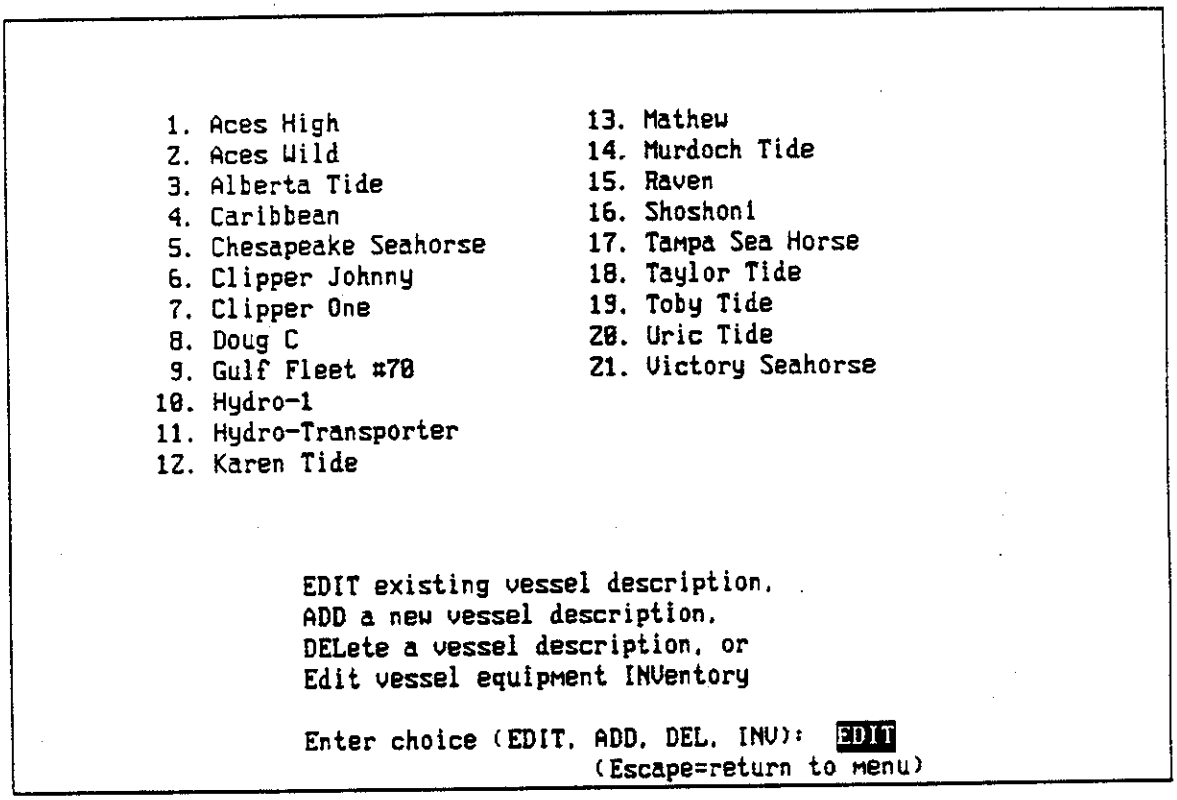

Platform : GAIL
Equipment: Logging Unit
Screen 2 of 2
Fuel Type: D (D, NG)
1986
1987
1988
1989
1990
Units
Fuel Usage: 0.000 0.000 0.000 0.000 0.000
Hours in Use: 0 0 0 0 0 hrs/yr
Fuel Consumption at max load (scfh or gal/hr): 10.00
Enter Emission Factor ID: 1 (press F10 for list)
Next Record=PgDn, Scrn 1=PgUp, Exit=Ctrl-End, Abort=Esc

3

VESSEL DATA MAINTENANCE

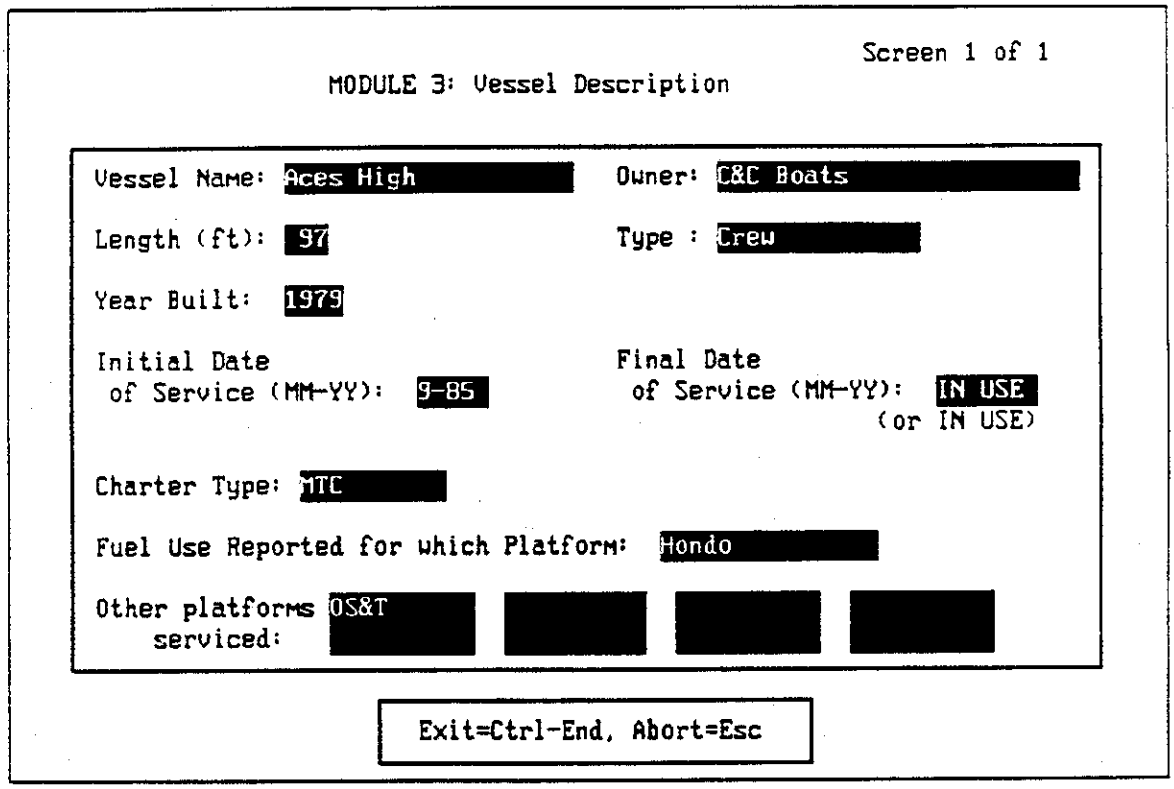
3.1 DESCRIPTION

The vessel maintenance menu allows you to access both general and specific data for each vessel in the database. An example of this menu is shown below. The data is organized in two levels. From this screen, the options to EDIT, ADD, or DELete pertain to the vessel as a whole. To access the data for individual equipment on a specific vessel, choose the INV (for Inventory) option--see section 2.3.2 for details.



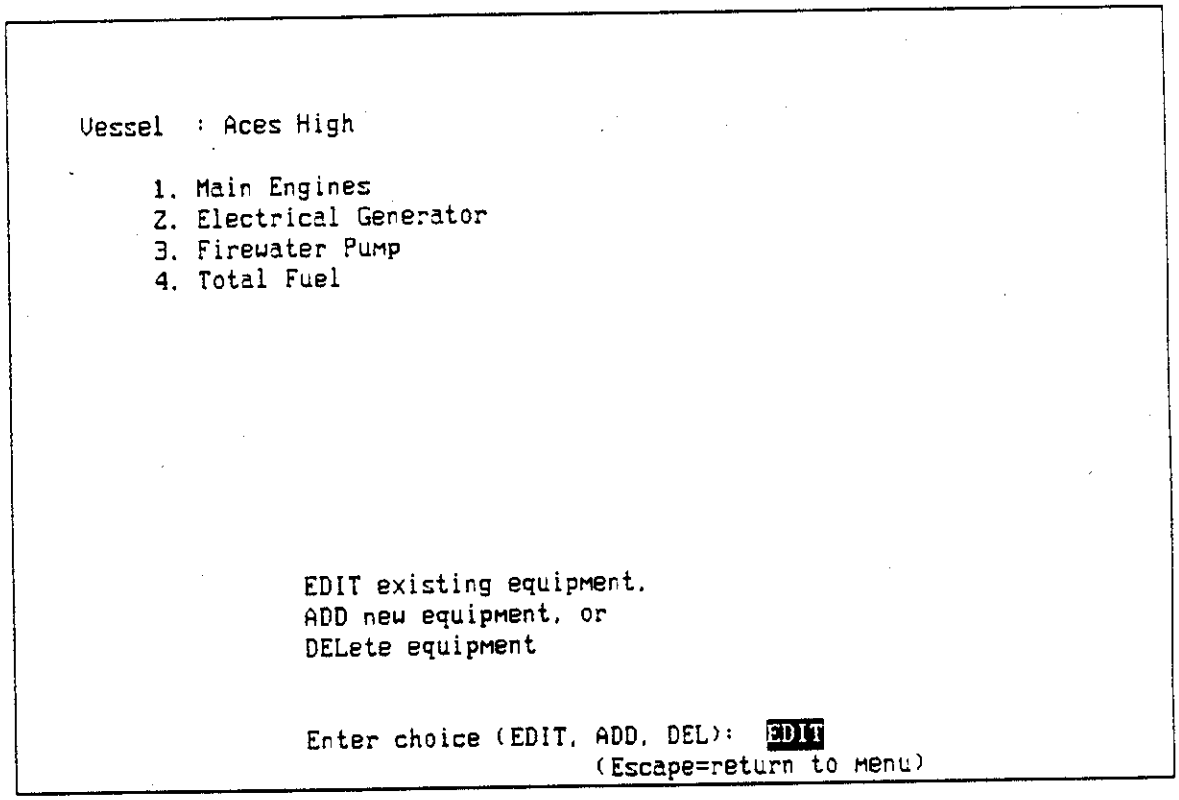
3.2 GENERAL VESSEL INFORMATION

If you choose to edit the general vessel descriptions. You will be asked to first specify the line number of vessel of interest. Then, the following screen will appear. Edit or enter the desired information; press **[CTRL][END]** when you are done. Note that there is space for 8 possible entries for the "Other Platforms Serviced" field.

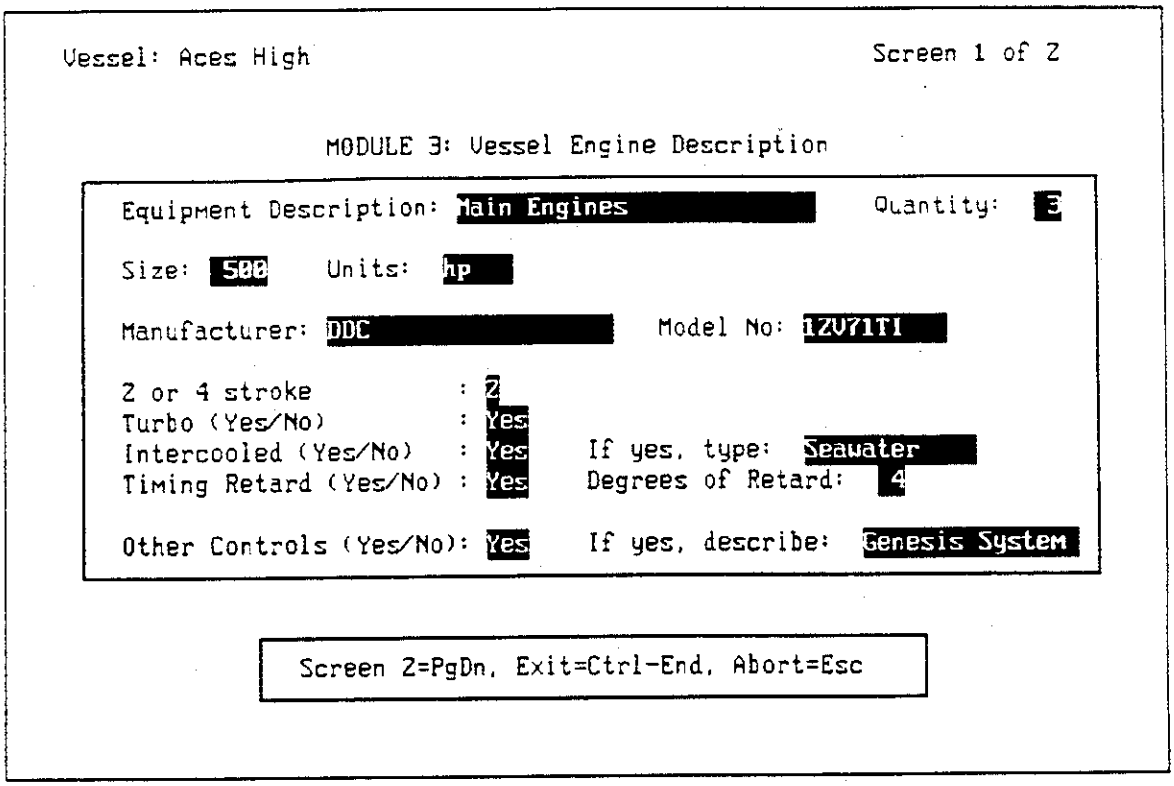


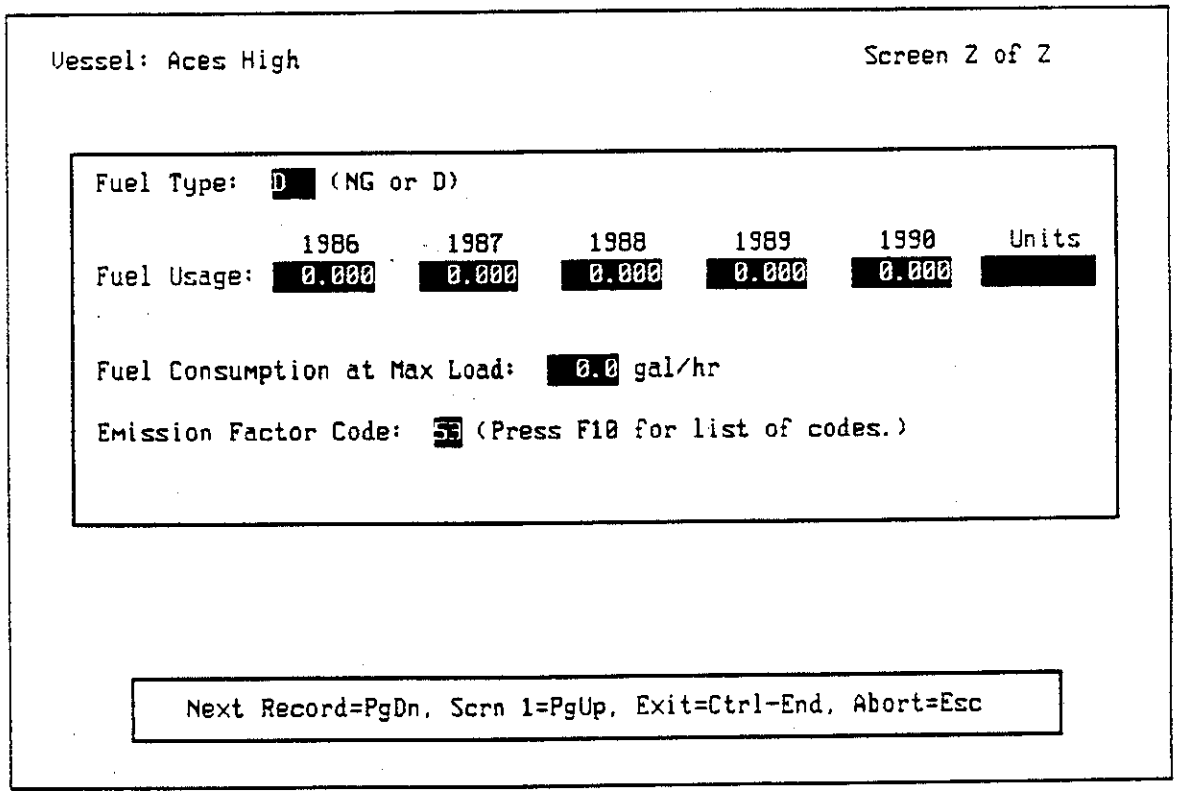
3.3 EQUIPMENT INVENTORY

If you choose to edit the vessel equipment inventory, you will first be asked to specify the vessel of interest. Then, the equipment list for the vessel will appear (see below).



Choose whether you want to EDIT, ADD, or DELete items from the inventory. If you choose to edit an item, screens like the following examples will appear. Note that input screens for all the items from the list will be shown; press **[PgDn]** to cycle through the screens until the item you want to edit appears. Press **[CTRL][END]** when you are done.


Vessel: Aces High
Screen 1 of 2
MODULE 3: Vessel Engine Description
Equipment Description: Main Engines
Quantity: 3
Size: 500
Units: hp
Manufacturer: DDC
Model No: 12V71TI
2 or 4 stroke : 2
Turbo (Yes/No) : Yes
Intercooled (Yes/No) : Yes
If yes, type: Seawater
Timing Retard (Yes/No) : Yes
Degrees of Retard: 4
Other Controls (Yes/No): Yes
If yes, describe: Genesis System
Screen 2=PgDn, Exit=Ctrl-End, Abort=Esc

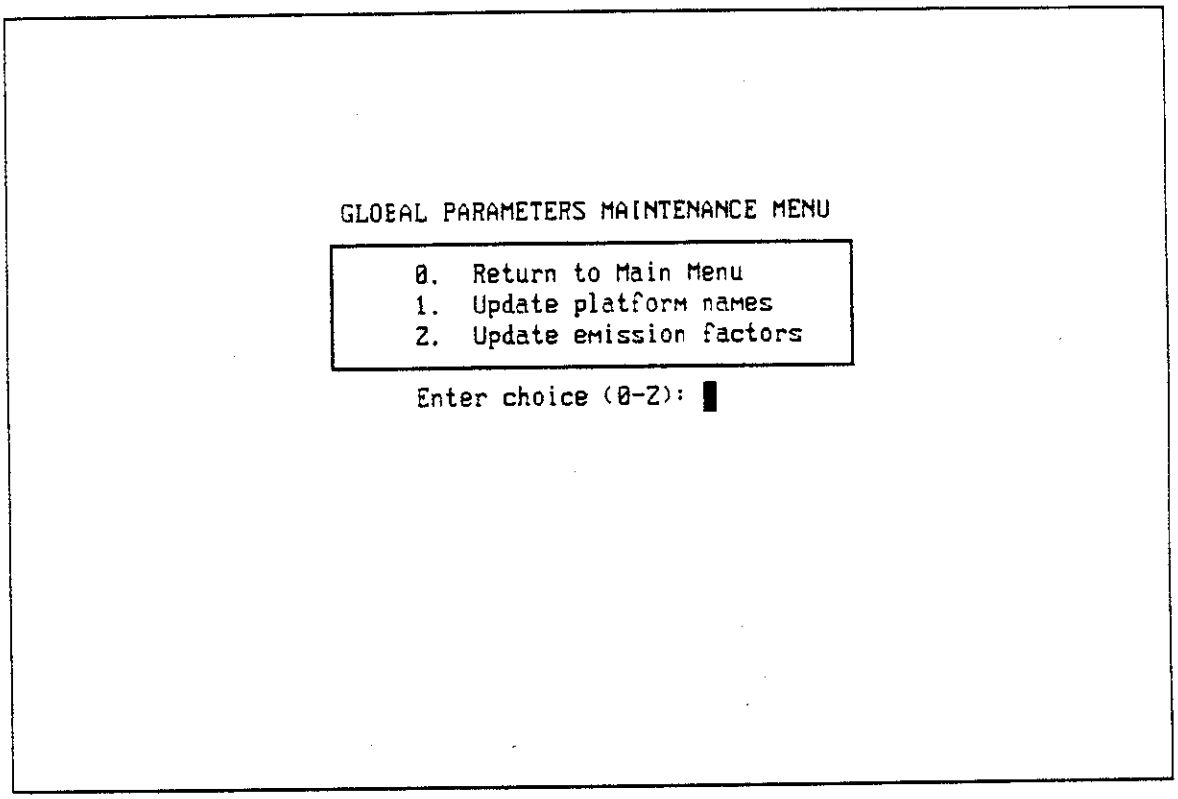

Vessel: Aces High
Screen 2 of 2
Fuel Type: D (NG or D)
1986
1987
1988
1989
1990
Units
Fuel Usage: 0.000
0.000
0.000
0.000
0.000
Fuel Consumption at Max Load: 0.0 gal/hr
Emission Factor Code: 55 (Press F10 for list of codes.)
Next Record=PgDn, Scrn 1=PgUp, Exit=Ctrl-End, Abort=Esc

4

GLOBAL PARAMETERS

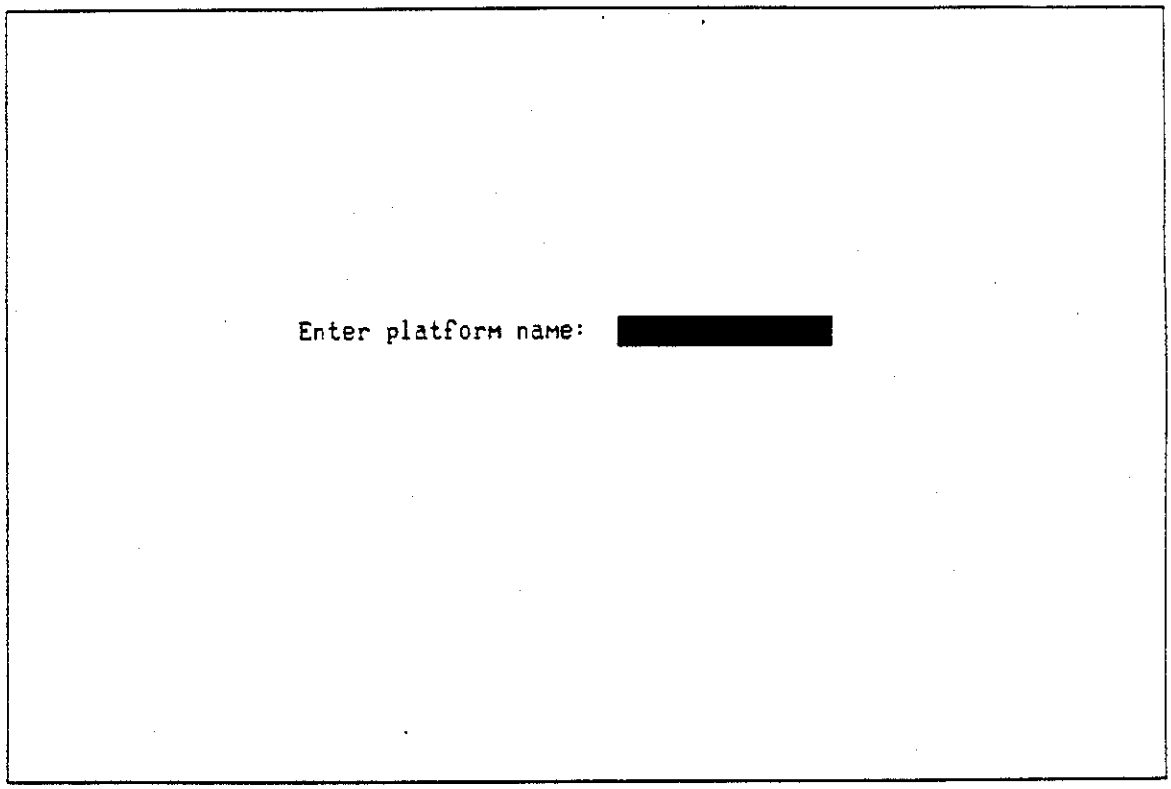
4.1 DESCRIPTION

This Main Menu option will allow you to add platform names or maintain the emission factor file. An example of the global parameters menu is shown below.



4.2 PLATFORM NAMES

Currently, the platform maintenance option is not very sophisticated. As shown below, enter a new platform name. Because of the file naming conventions in the OCSINV model, you cannot enter a platform name that has the first six characters in common with an existing name. If such a situation occurs, a dBASE programmer must revisit the OCSINV code.



4.3 EMISSION FACTORS

If you choose this option, a screen like the example below will appear. This screen is simply using the dBASE browse option. With this option, you can use all browse capabilities to add, delete, or modify the emission factor data. Press [CTRL][END] when you are done; press [ESC] if you wish to abort any changes you have entered for the current line.

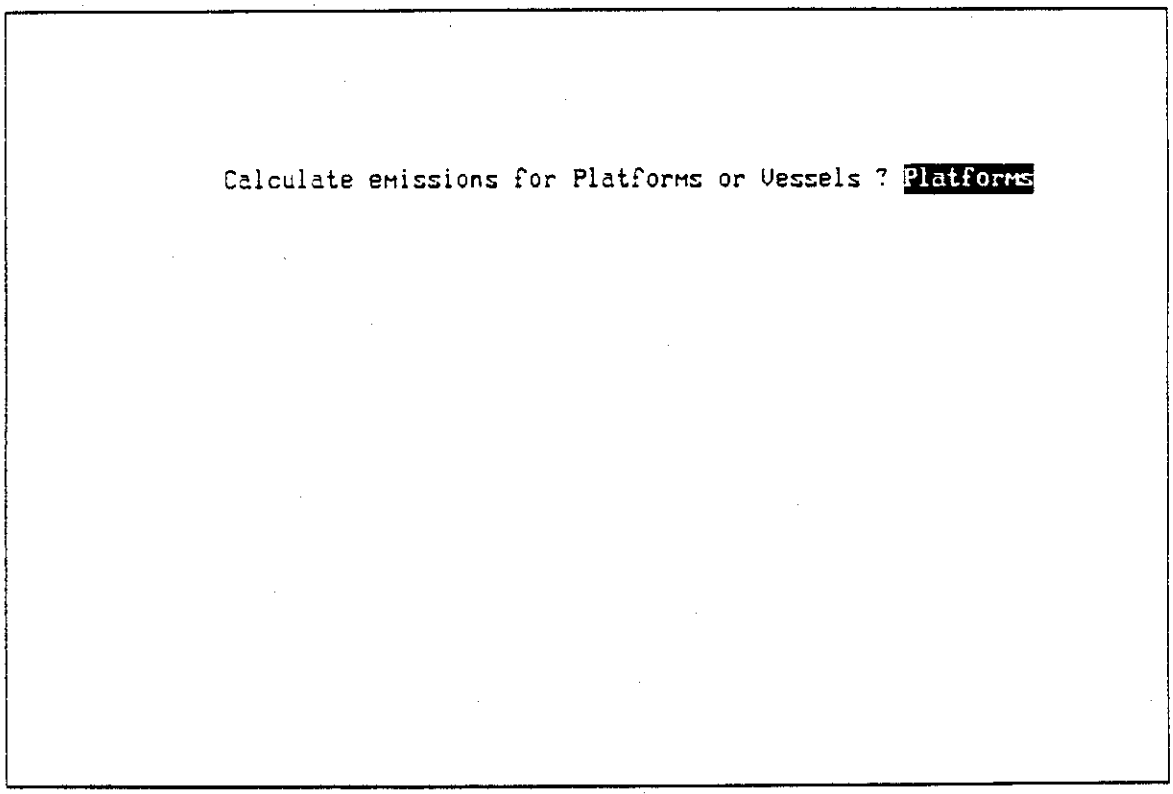
CODE	THC	NOX	SO2	CO	TSP	UNITS	DESCRIP
1	37.50	469.00	31.20	102.00	33.50	lbs/1000 gal	Cranes, H
2	14.00	500.00	0.00	130.00	50.00	lbs/1000 gal	Emerg. Ge
3	5.80	140.00	0.00	35.00	5.00	lbs/MMSCF	Flares, T
4	42.00	413.00	0.00	115.00	14.00	lbs/MMSCF	NG Turb
5	5.60	67.80	0.00	15.40	5.00	lbs/1000 gal	D Turb
6	23.00	300.00	0.00	120.00	14.00	lbs/MMSCF	NG Compr
7	8.00	100.00	0.00	20.00	5.00	lbs/MMSCF	Glycol Re
8	59.10	364.00	0.00	43.70	33.50	lbs/1000 gal	Hondo Eme
9	12.60	310.00	0.00	246.00	14.00	lbs/MMSCF	Hondo NG
10	3.70	51.00	7.00	52.90	5.00	lbs/1000 gal	Hondo D T
11	10.20	25.77	0.00	69.30	5.00	lbs/1000 gal	Turb Gen
12	46000.00	0.00	0.00	0.00	0.00	lbs/MMSCF	Gina, A,
13	44568.00	0.00	0.00	0.00	0.00	lbs/MMSCF	Habitat U
14	56000.00	0.00	0.00	0.00	0.00	lbs/MMSCF	Henry Ven
15	58000.00	0.00	0.00	0.00	0.00	lbs/MMSCF	Hillhouse
16	61560.00	0.00	0.00	0.00	0.00	lbs/MMSCF	Hogan and
17	42.00	123.90	0.00	115.00	14.00	lbs/MMSCF	NG Turb w
18	23.00	30.00	0.00	120.00	14.00	lbs/1000 gal	Habitat,

5

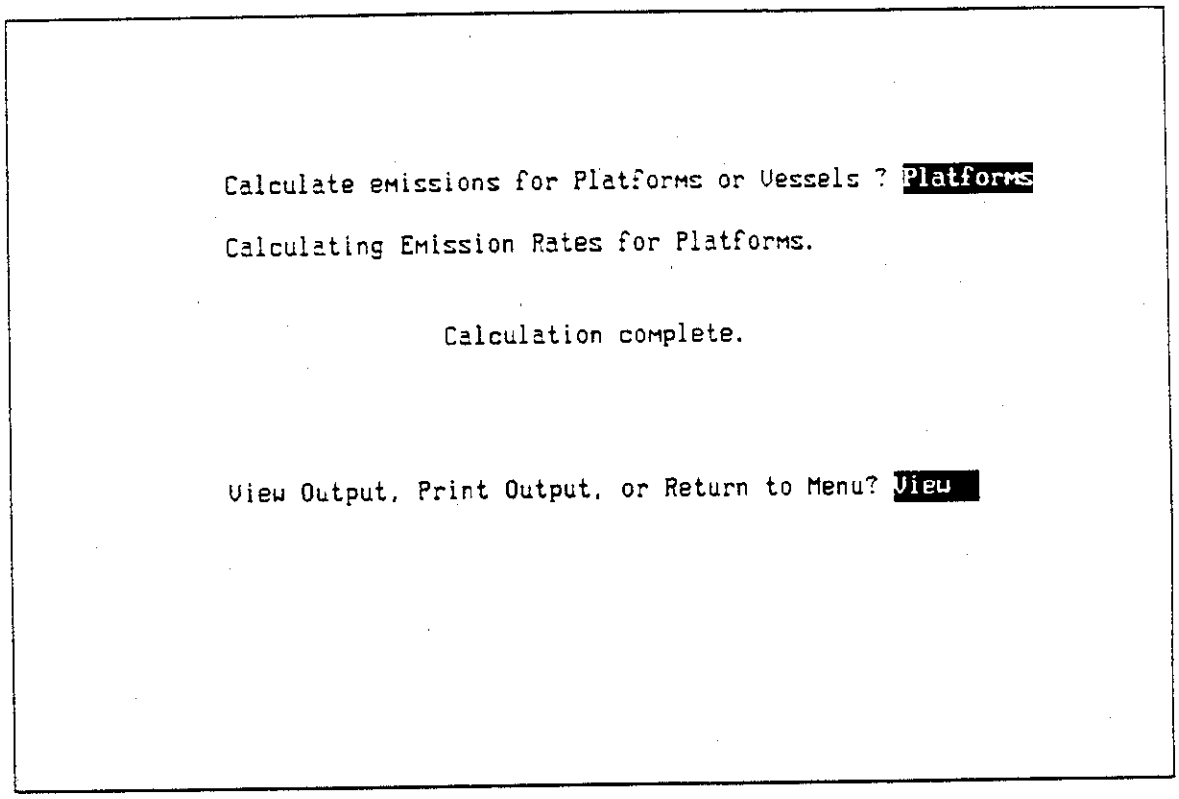
CALCULATION OPTION

5.1 DESCRIPTION

This option will automatically calculate an emission rate for each item in the inventory by multiplying the fuel use for each piece of equipment by the emission factor represented by the factor code. The effects of other parameters such as sulfur content of the fuel are also included in the calculations. As shown, first select whether you want to calculate the emissions for platforms or vessels.



While the calculation is taking place, the message "**Calculating Emission Rates or...**" will appear. When the calculation is complete, you will have the option of viewing the output, printing the output, or returning to the Main Menu (see below).



If you choose to view the results, the following screen will be displayed. As shown, this is a very detailed listing of the calculated emission rates for each item by platform. Use the arrow, **[PgUp]**, or **[PgDn]** keys to scroll through the list. Not all the column are shown at once, use the **[F3]** and **[F4]** keys to shift the columns left and right, respectively. When you wish to exit the viewing screen, press **[ESC]**.

PNAME	ENAME	SIZE	UNITS	CONFLG	FTYPE
GAIL	Air Compressor	19.20	hp		D
GAIL	Crane #1 (north)	225.00	hp		D
GAIL	Crane #2 (south)	545.00	hp		D
GAIL	Drilling Stndby Gen	975.00	hp		D
GAIL	Firewater Pump	481.00	hp		D
GAIL	Flare (10-100)	-1.00	mmbtu/hr		NG
GAIL	Life Capsule #1	36.00	hp		D
GAIL	Life Capsule #2	36.00	hp		D
GAIL	Life Capsule #3	36.00	hp		D
GAIL	Oil Spill Power Pack	65.00	hp		D
GAIL	Standby Gen.	1840.0	hp		D
GAIL	Turbine #1 (G-01)	4500.0	hp		NG
GAIL	Turbine #1 (G-01)	4500.0	hp		D
GAIL	Turbine #2 (G-02)	4500.0	hp		NG
GAIL	Turbine #2 (G-02)	4500.0	hp		D
GAIL	Turbine #3	4500.0	hp		NG

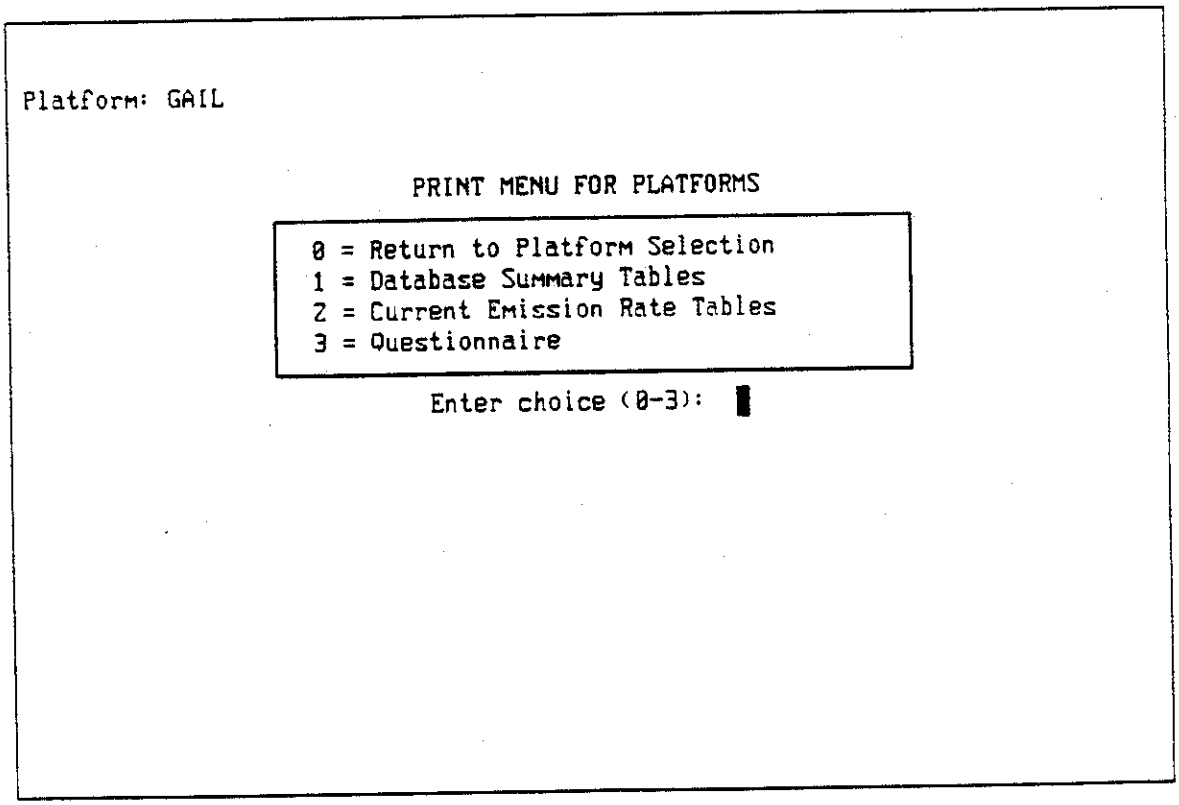
CURSOR CONTROL=Arrow/Home/End keys. SCROLL ← or → =F3 or F4. EXIT=Escape

6

PRINT OPTION

6.1 DESCRIPTION

Select option 5 from the Main Menu to print a summary of the database, a summary of the current emission rates, or a copy of the questionnaire that was used for the data gathering effort for this task. You will first be asked to specify the default printer so that the proper driver can be used. Note that this list is limited; when developing the model, our main focus was to direct the print-out to the HP laser printer. If your output is garbled, a dBASE programmer may have the correct these settings (see subroutine **Mprint.prg**). You will then be asked to select between platform or vessel tables. If you request platform tables, you must specify the platform of interest. The following menu will appear.



If you choose to print vessel tables. You are then asked to select between the database summary tables or the current emission rate tables. The vessel data is printed for all vessels; you cannot request to print individual vessel data.