



terminals pty. ltd.

MELBOURNE SITE

ANNUAL ENVIRONMENT

IMPROVEMENT REPORT FOR 2004

LICENCE NO. EM29227

DECLARATION

I hereby state that I have authorised the preparation and issues of this environmental performance report and that it is complete, correct and accurate to the best of my knowledge and belief. I am unaware of any past or current circumstances which would render the report misleading or inaccurate.

Signed: _____ **Date:** _____

George Horman
Managing Director
Terminals Pty Ltd

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INTRODUCTION

Terminals Pty Ltd Melbourne is situated on two distinct sites located on Coode Island which is in the docks area of Melbourne. The original 'Terminals' site is called 'Plant B' and was constructed in the early 1960s. The other site is called 'Plant C' and was purchased from Powel Duffryn in 1992. The Melbourne site is located approximately 5 kilometres west of the Melbourne CBD and is bounded by Footscray Rd to the north, Maribymong River to the west, Swanson Dock to the east and the Yarra River to the south.

The 'Plant B' terminal is located on two parcels of land on either side of Mackenzie Road, Footscray on reclaimed land between the Maribymong River and the Port of Melbourne container storage area and wharf facilities. The main site is 52-68 Mackenzie Road. The western side is adjacent to the Maribymong River and houses the administration areas, main tank farm, boiler house, vapour emission control system, drum filling facility and truck loading gantries. The eastern facility at 47 Mackenzie Road has a tank farm and truck loading platform with the product pipelines and services connected to the main property by a culvert under the road containing fire water, product and service lines.

The 'Plant C' terminal is also located on two parcels of land on either side of Mackenzie Road, south of the Melbourne B facility. The main site is 70-78 Mackenzie Road. The western side is adjacent to the Maribymong River and Maribymong No.1 berth. It houses the main offices, tank farm and truck loading gantries. The eastern facility contains offices and workshop, weighbridge, tank farm, boiler house, vapour emission control system and truck loading gantries with fire water, product pipelines and services connected to western side via two culverts.

In 1998, Terminals started the Coode Island Community Consultative Committee (CICCC) to cover its Melbourne site operations on Coode Island. In 1999, Melbourne site gained ISO 14001 certification for its Environmental Management System. In 2001, an Environment Improvement Plan (EIP) was developed by Terminals in consultation with EPA, other agencies and the Coode Island Community Consultative Committee. This covered two years from 2002 to the end of 2004. Subsequently a new EIP has been developed for four years from January 2005 to the end of 2008.

In April 2004, EPA changed the licence conditions in Terminals' EPA licence (no. EM29227) to reflect an accredited EPA licence. This recognises a high level of environmental performance and is based on:

- Terminals' environment management system.
- Environmental Audit Program by an independent EPA environmental auditor for industrial facilities in conjunction with the internal environmental auditing system. The independent audit program is detailed by AWN consultants in correspondence to the EPA dated 23 October, 2003.
- Environmental Improvement Plan developed in consultation with EPA and community consultative committee (CICCC).

This annual environment improvement report covers the 2004 calendar year.

ENVIRONMENT POLICY

Terminals Pty Ltd has an integrated approach in its Environment Management, Safety Management and Quality Management Systems with the underlying themes of protecting the environment and safety of all people as well as continual improvement.

The Environment Policy is shown on the following page.

ENVIRONMENT POLICY

It is the policy of Terminals to operate our facilities in a manner that will protect the environment.

THIS POLICY IS FOUNDED ON:-

- ❖ Identifying and managing the environmental risks associated with our business.
- ❖ Providing training and promoting environmental awareness and responsibility amongst all employees.
- ❖ The efficient use of resources and minimisation of waste or loss.
- ❖ Periodic environmental assessments of our facilities, from which ongoing improvement programs will be implemented.
- ❖ Compliance with regulatory requirements is the minimum acceptable level of performance.

In addition, all employees and contractors, working on site, are inducted to the site. This includes signing Terminals Health, Safety and Environment rules. The HSE rules are:

HEALTH, SAFETY AND ENVIRONMENT RULES

All Terminals' employees are to abide by the following rules.

1. Possession and/or consumption of intoxicating liquor, or drugs not prescribed by a medical practitioner are forbidden in Terminals' operating facilities. Attendance at work under the influence of intoxicating liquor or drugs is not permitted.
2. Physical and verbal abuse, harassment, and/or discrimination of any kind is forbidden.
3. Horseplay and practical jokes are prohibited on Terminals' premises.
4. All employees shall comply with safe working/operating procedures as per Operating Procedures (including MSDS) and Safety Management Manual or instructions.
5. Personal protective clothing and equipment provided by Terminals must be worn as per Safety Management Manual, Operating Procedures and Emergency Plan or instructions.
6. All warning and safety signs must be obeyed.
7. No safety device or system (eg. machine guards, fire pumps, critical operating safety interlocks etc) shall be made inoperative nor compromised as per the Safety Management Manual. To remove or tamper with guards, switches, danger tags and lockouts is a statutory offence.
8. All injuries, no matter how slight, must be reported to a person's immediate supervisor.
9. All spills or leaks of solid, liquid or gaseous materials (which are dangerous goods or environmental hazardous) must be immediately reported to supervisor; contained and cleaned up promptly as per Emergency Procedures Manual and management instruction.
10. All work areas and amenities must be kept safe and tidy. Access to fire fighting, emergency equipment and emergency exits must be kept clear at all times.

In addition, specific HS&E rules for highlighting are:

11. Cross ties between potable (drinking) water and any other system, without back flow protection, are prohibited.
12. All road tankers, drums and transfer equipment shall be earthed when flammable chemicals are handled.
13. Pigs, when contaminated with natural oil, must be immediately placed in drums full of water with closed lid.
14. Smoking is not permitted on site.

2004 AUDIT PROGRAM

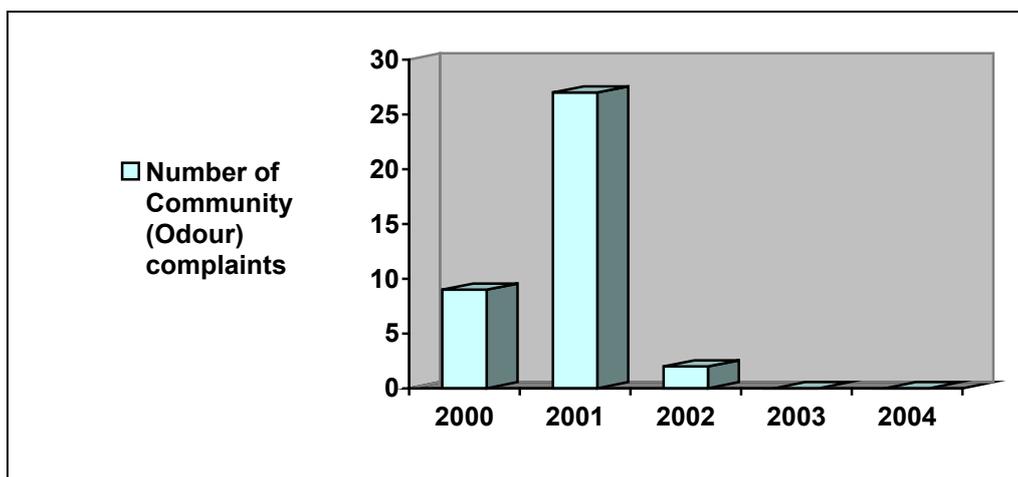
EPA accredited licence audit in 2004 was carried out over three days in July 2004. This is the first audit of this type under our new accredited EPA licence. Terminals' action plan involving the audit actions are tabulated in Appendix A. The internal audit program for 2004 totalled 17 audits of the Melbourne site including audit topics of operations, maintenance, training, incident reporting, management review, work permits and environmental management systems.

Lloyds Register audited the Melbourne site twice during 2004. There were no holding points or improvement notices.

The oversight program for Major Hazards Facility was conducted by Worksafe. This included five visits and an annual licence inspection over two days. The outcome was the overall results supported reducing the visit frequency from two to three months.

COMMUNITY COMPLAINTS

There were no community complaints during 2004. Historically community complaints have been associated with odours. A graph of community (odours) complaints is detailed below.



Note:

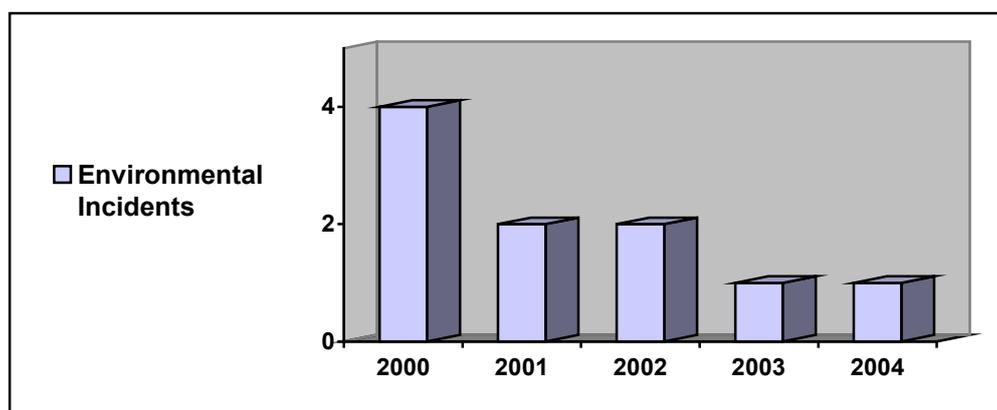
These complaints represent those that could be verified as emanating from, or caused by, Terminals. For instance, in 2001 there were a further 49 complaints but no odour sources could be found at Terminals or found caused by external operation.

The major influences in reducing these odour complaints have been the improved methodologies in treating acrylate chemicals. They include purpose built caustic scrubber, two stage treatment of joining existing activated carbon VEC with existing caustic scrubbers; combustor VEC; closing in odorous VEC building with extraction and general environmental awareness.

ENVIRONMENTAL INCIDENTS

Historical trend of environmental incidents is detailed below. These are defined as spills greater than 200 ltrs, EPA reportable incidents (ie cause or likely to cause an offsite discharge or odour), licence breaches and EPA infringement actions. But these incidents do not include odour complaints as reported previously, nor benzene emissions exceeding historical 51g/min licence condition, which regularly occurred until the thermal oxidiser (combustor) vapour emission control system was commissioned in November 2002 for benzene treatment.

In 2004; there was a spill of 500 ltrs of di-octyl phthalate (DOP – non dangerous goods) into a concrete sealed contained area. The cause was the internal ball from the bottom valve of an IBC popping out when the IBC was half full. Preventive action is to ensure bottom valve is in tact and plugged before filling IBC. As this incident was completely contained on site, it was not reported as an EPA reportable incident but recorded as an environmental incident.



Of these incidents, two were spills (ie. DOP spill in 2004 and styrene tank floor leak in 2002); two were air emission breaches (ie. administrative breach in operation of activated carbon VEC – 2002, and propylene oxide emission – 2003) and two were stormwater breaches (ie. sewerage plant non compliances in 2000) and due to odour emissions/controls, three EPA penalty infringement notices over 2001/02 and an EPA prosecution from 2000.

EPA WASTE DISCHARGES

AIR EMISSIONS

Tabulated below shows a comparison of the estimated air emissions from the various discharge points with the emission limits specified in revised 2004 EPA licence, Table 1.

Waste	EPA Emission Limits (2004)		Estimated Emissions (Kgpa)				
	Total Mass Rate (kg/min)	Total Annual Mass Rate (Kg/annum)	2000-2001	2001-2002	2002-2003	2003-2004	2004
Acrylonitrile	2	350	235	132	122	4	2
Benzene	36	1500	6970	4000	1478	151	138
Butyl Acrylate	1.1	65	225	24	13	23	21
Ethyl Acrylate	0.25	8	21	8	0	0	0
Methyl Methacrylate	1.1	200	736	94	41	64	65
Phenol	0.055	6	2	2	3	10	13
Propylene Oxide	150	420	295	275	283	277	297
Toluene Di-isocyanate	0.015	0.3	0.1	0.1	0.1	0.1	0.1#
Non-specified VOC	530	9300	6230	6400	4820	2790	2790#
Carbon monoxide	40	1100				*	*
Total nitrogen oxides	240	9500				*	*
Total sulphur oxides	70	18000				*	*

Notes: * there was insufficient data to estimate the combustion products from the combustor VECs due to the burning of a wide range of vapour emission material as well as natural gas. However monitoring data covering 21 samples (63 tests) showed full compliance to and generally less than 10% of the licence emission limit.

the 2003/04 financial year estimated emission was used for 2004 calendar year.

These emission estimates are based on US Tanks 4.0 or API 42 software calculations as a function of storage tank dimensions, chemical physical properties, and tank container filling quantities, duration in the tank and emission treatment effectiveness.

VOC is defined as per NPI definition of all hydrocarbons with a vapour pressure greater than 0.04psi.

WASTE WATER MONITORING RESULTS 2004

There was no non compliances to the waste discharge criteria specified in the Environmental Management Manual. That is.

Performance Indicator Unit	Limit/s
Biochemical Oxygen Demand	40 (mg/l) Maximum
Suspended Solids	60 (mg/l) Maximum
Toxicity as determined by microtox	100 Minimum
pH	6-9
Total Organic Carbon	40 (mg/l) Maximum
Dissolved Oxygen	5 (mg/l) Minimum
Flow rate	200 kilo litres/day Maximum
Temperature	Ambient

Any exceeding of these limits requires an I & NCR to be raised so follow up action can be determined.

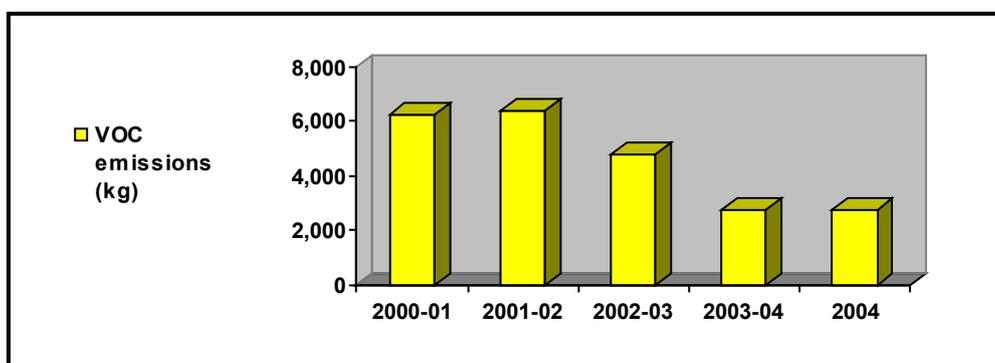
The results are detailed in Appendix F, called EPA Performance Monitoring Report 2004.

WASTE MANAGEMENT PERFORMANCE

The environmental Management System reviews existing and develops new targets and objectives on an annual basis. This is also called the Waste Management Plan. The 2003-2004 environmental objectives and targets performance report for September Quarter is attached as Appendix B. The 2004-2005 environmental objectives and targets plan is attached as Appendix C.

The analysing of emission discharge points during 2004 found no non compliances over 201 samples as detailed in Appendix F.

Total VOC emissions to the atmosphere are shown below.



Treatment systems effectiveness are generally conservative and include:

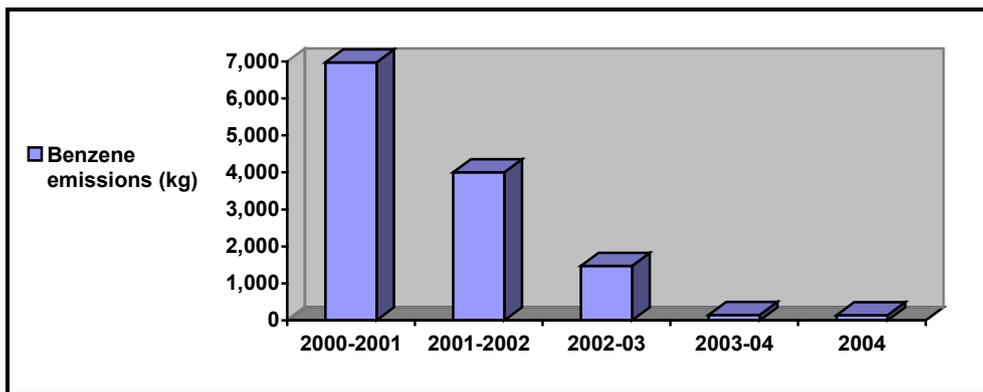
- Vapour return at 100%
- Combustor at 99.6% but initially (2002-03) combustor efficiency factor of 99.96% was used on actual design performance effectiveness. The assumption of 99.6% has been verified by analysing results. The effectiveness could be higher but the accuracy is limited by the measuring sensitivity of the outlet results.
- Activated carbon bed at 90% after July 2001 and 85% previously due to workload and performance.
- Caustic scrubbers for acrylates range from 85% to 90% while two in series or scrubber with activated carbon VEC scored 98.5%
- Phenol scrubber at 95%
- PO scrubber at 99%. This assumption has been verified by analysing results.
- TDI ammonia scrubber plus activated carbon treatment at 99%.

Efforts to reduce VOC emissions have been focused on reducing emissions of class 3 indicators, benzene and acrylonitrile, as well as odour generators, acrylates, as priority. This has been achieved as demonstrated in the graph above and the following specific graphs. The reasons are:

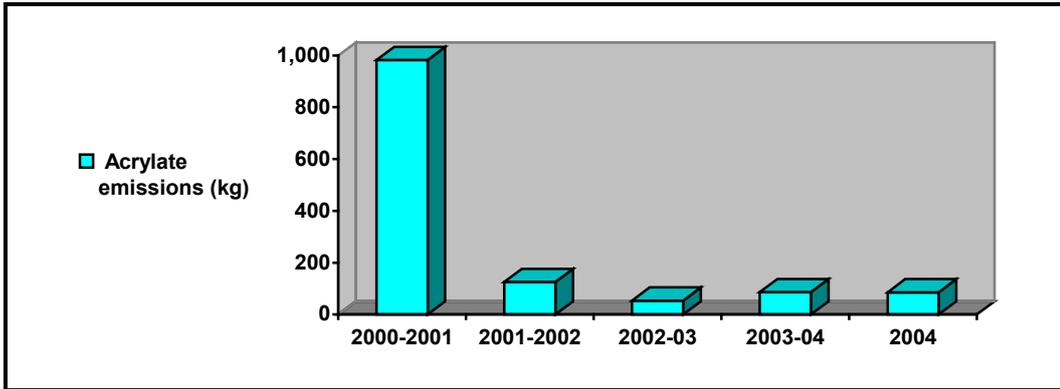
- Combustor started treating benzene emissions from November 2002.
- Combustor started treating acrylate storage tank emissions from December 2002 at Plant B
- Combustor started treating acrylonitrile storage tank emissions from June 2003

Phenol emissions have increased due to the high throughput and importing of this product with the shutdown of the Huntsman plant in 2004. Presently exceeds licence annual amount although all individual monitoring results are well below the licence mass emission rate.

Benzene emissions to air are graphed below and further demonstrate the VOC emission findings.



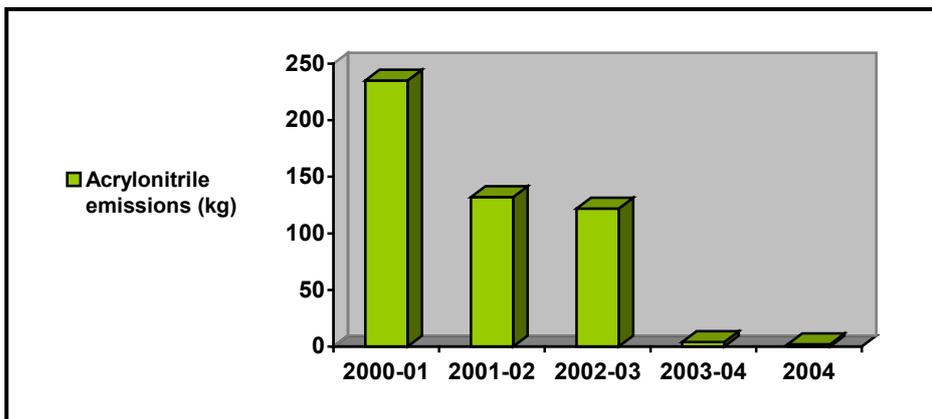
Acrylate emissions are graphed below.



Because of the significant number of odour complaints in 2001 from acrylate operations, several strategies were implemented to reduce odour (acrylate) emissions and complaints from handling 10-20 acrylate storage tanks located at different parts of the site. These treatment improvements included:-

- Two stage treatment process using available caustic scrubbers with activated carbon VECs.
- Installing a new purpose built caustic scrubber for acrylate treatment.
- Consolidating acrylates into one area to make use of best available caustic scrubbers then later combustor treatment.
- Exiting the highly odorous ethyl acrylate business in late 2001.

Acrylonitrile emissions are graphed below.



From July 2004, acrylonitrile is no longer stored nor handled on site.

PRESCRIBED LIQUID WASTE

Total EPA prescribed wastes transported from Melbourne site to an approved treatment facility are detailed in Appendix D. Breakdown components and previous results are tabulated as a means to identify waste sources and minimisation strategies. In general terms, the Melbourne site has been undergoing major upgrading of its facilities while preparing to totally decommission all storage tanks on the east side of Mackenzie road. This has involved cleaning storage tanks, major renovations to tanks, new foundations including environmental liners and moving storage tanks. As a result general liquid waste has substantially increased by 3730 tonnes (276%). The tank and, in turn, pipework upgrades incorporate many waste minimisation improvements, eg. solid piping at exchanger pits, tank stripping lines etc. However, the Melbourne site needs to approach a plateau of consistency before it can demonstrate these long term waste minimisation benefits, whereas presently waste from cleaning tanks and pipework to enable major upgrades, dominate the waste trends.

On a positive side, the increased combustor treatment of vapours compared to the activated carbon VEC has led to a significant decrease in VEC waste of 1573 tonnes (88%).

When the substantial transformation of the site approaches a settling down plateau then a waste generation reference base can be reached leading to monitoring of overall waste minimisation improvements.

SOLID WASTE

The total waste transported off site in 2004 was 27.4 tonnes. The breakdown of this waste into components with comparison to previous years is tabulated below.

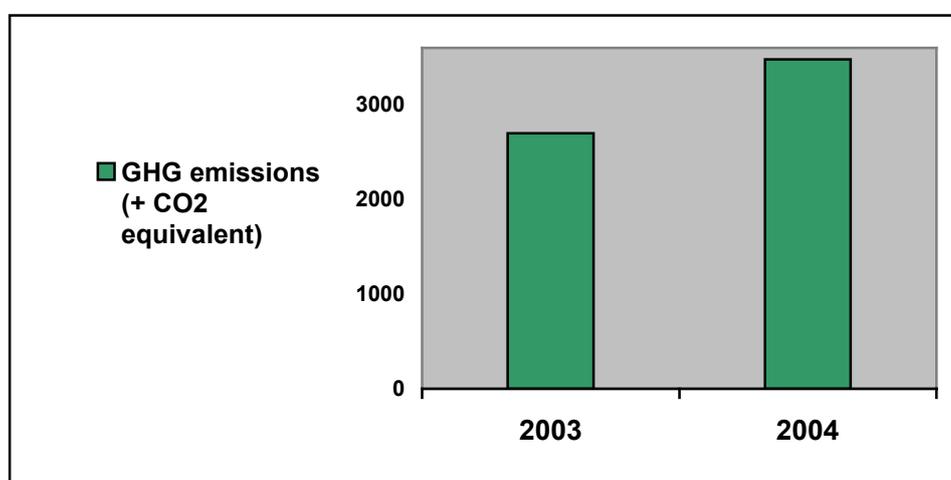
PRESCRIBED SOLID WASTE			
	YEARS		
	2001/02 (tonnes)	2002/03 (tonnes)	2003/04 (tonnes)
Foam pigs (F100)	1.5	3.8	7.6
Contaminated Soils including sandblasting grit (N120)	22.9	2.3	17.5
Activated carbon (N210)		16	2.3
Drums (N100)		2.2	
Sludges & residues (N205)	36.5		
Organic cyanides (M210)	26.9		
TOTAL	87.8	24.3	27.4

A dominating theme is the upgrading of tanks, foundations and pipework. This causes waste from cleaning tanks/pipework, grit blasting tanks and removal of contaminated soil hot spots in accordance with our Groundwater Management Plan.

ENERGY EFFICIENCY AND GREEN HOUSE GASES

A level two energy audit was undertaken on 21st October 2003 by ERM. The energy assessment was undertaken as part of the Victorian EPA Protocol for Environmental Management (PEM) requirements, ie. a category C of the PEM requiring a level two energy and greenhouse gas assessment. This report has been submitted to the EPA and is presently being reviewed.

Greenhouse Gas (GHG) emissions are graphed below in equivalent tonnes of CO₂ emissions. These figures do not include the combustion products from treating the product vapour emissions.



These are derived from usage of natural gas for boilers (2) and combustor treatment units (2); electricity for pumps/fans/utilities and diesel for firewater pumps and forklifts/trucks. Fuel usages are converted to energy consumption (GJ) and, in turn, to GHG emissions (t CO₂ equivalent) using standard emission factors from the AGO website. The last two years are tabulated below and cover the period of the combustor operating. The information is based on invoice meter readings. A minority of the records cannot be found and these values have been estimated based on the available majority of data.

Fuel Type	2003		2004	
	Fuel consumed	GHG emissions (t CO ₂ equivalent)	Fuel consumed	GHG emissions (t CO ₂ equivalent)
Natural Gas (GJ)	14,279	738	23,256	1,202
Electricity (KWH)	1,306,733	1,887	1,530,220	2,210
Diesel (kl)	25	68	25	68
Total		2,693		3,480

The breakdown of emission contributors are electricity around 60-70%, natural gas at about 30% and diesel at 2%.

The GHG reduction action plan has been developed as part of the submitted Energy and Greenhouse Gas Assessment Report. Two major actions focus on the combustor units, the high GHG emitter, ie. reduced temperature set point and reduced hours when no emission load. In addition these actions include shutting down the steam boiler, vapour emission control system and operations located on the east side in 2005 which has been estimated to reduce fuel gas usage by 10% and electricity by around 20-25%.

GHG actions are reported in Appendix C as part of the 2004-2005 Environmental Targets Plan.

GROUNDWATER MANAGEMENT PLAN

The eastern parts of the facility are scheduled for remediation during 2005 as per the Remediation Action Plan of July 2002.

The annual Groundwater Monitoring Report of the west side for 2004 calendar year was completed by ERM and submitted to the EPA. This included separate reports (February 2004 and July 2004) detailing gauging, samples and analysis. These reports are in accordance with our Groundwater Management Plan dated 30 November 2001.

These results show

- Excavated removal of soil contamination at Plant C south plus installation of separate phase hydrocarbon (SPH) trenches.
- Plant B north east area shows SPH. The plan is to excavate soil contamination and install recovery trenches when access is possible. This occurs in the near future when Terminals leaves the east side, enabling removal of east side docklines that are presently restricting access.
- Downgradient off site monitoring wells are generally meeting the adopted criteria; usually ANZECC Guidelines for Fresh and Marine Waters.
- Exceptions are Plant B south (MW24) and Plant C north (RF3A). The former is now trending towards the criteria after finding and rectifying a cracked pipe in the local air sparging system. The PVC piping system has been upgraded to galvanised pipe. The latter at Plant C north (RF3A) is presently being delineated to find the cause and extent of the problem; the source may be related to a neighbouring company rather than Terminals.

Terminals proposes to continue the existing annual monitoring program and assessment including the specific initiatives detailed above.

The annual Groundwater Monitoring Report of the previous Plant A site for 2004 was completed by ERM and submitted to EPA in October 2004. The results are consistent with previous year's results. Off site monitoring wells did not detect any analytes above the ANZECC guidelines. The recommendation is to continue the annual groundwater monitoring program.

ENVIRONMENT IMPROVEMENT PLAN (EIP)

Completion of action items from the first EIP (2002 to 2004) is summarised below and detailed in Appendix E, called Improvement Action Report.

Year	Completed	Deferred Indefinitely	Recycled
2002 to 2004	30	1	14

Some of the major achievements include:

- commissioning of majority of stages of combustor treatment unit, ie new vapour emission control system
- upgrading of acrylate storage tanks and loading systems to sealed systems
- fitting high density polyethylene impermeable liners under tank floor as tanks were renovated
- implementing new exchanger area for Plant C and for acrylates
- installing waste minimisation pipework for acrylate storage tanks
- installing backup emergency power supply for combustors and critical equipment

This EIP concluded at end of 2004. A new EIP has been developed for the following four years to the end of 2008. This is presently awaiting approval from the EPA and community consultative committee (CICCC).