

RED DOT DECISION SUMMARY

VICTORIAN CIVIL AND ADMINISTRATIVE TRIBUNAL

ADMINISTRATIVE DIVISION

PLANNING AND ENVIRONMENT LIST

VCAT REFERENCE NOS. P3601/2004 & P1354/2005
PERMIT APPLICATION NOS. 1363/2004 & WA57306

IN THE MATTER OF Terminals PL v Greater Geelong CC and Ors

BEFORE Tonia Komesaroff, Presiding Member & Dr S Mainwaring, Member

LOCATION OF PASSAGE OF INTEREST	Paras nos. 62, 91, 140.
REASONS WHY DECISION IS OF INTEREST OR SIGNIFICANCE	
POLICY – interpretation or application of policy	SEPP (Air QM); Precautionary Principle;
APPLICATION – significant, interesting or unusual use or development; application of policy, provision or principle; or circumstances	This was previously red-dotted as a preliminary point on characterisation of use as a store/warehouse or wharf. This is now red-dotted as a proposal to use an existing chemical storage facility at Geelong Port for the importation by ship and storage of butadiene (a carcinogen) until on-forwarding by road tanker transport to industry, because it has excited considerable local and regional community angst about health risks.

Summary

CATCHWORDS

Planning and Environment; storage of Butadiene chemical; characterisation of use; whether use or development permit required; construct sphere in existing chemical storage facility in Special Use 6 Zone abutting Geelong Port; strong state and local policy supporting port related activities; shipped butadiene stored prior to delivery to manufacturers; site abuts petroleum refinery; public health and safety; cumulative impacts; individual risk, societal risk.

Environment Protection; Works approval; Butadiene carcinogenic chemical; Class 3 indicator; consistency with State Environment Protection Policy Air Quality Management; limit of discretion under *EPA Act*.

The anxiety factor

62. The proposed development has resulted in a significant level of concern on the part of local residents in the immediate area of the subject site and as far away as Queenscliff. We appreciate that there is a genuine fear within the local community and that this fear has been harnessed by a number of community groups. We note the positive impact of the Geelong Community for Good Life Incorporated whose efforts have resulted in an upgrading of the operations at the Shell Refinery including increased community consultation directed towards reducing emissions and improving safety practices for the greater good of the community as a whole. We do however have reservations about the impact of the media hype that has surrounded this proposal and the impact that this has had on enhancing the fears of the local community to an extent that is out of touch with the realities of the potential impact of the proposed development.
63. No evidence was provided to us of any long term health effects associated with the perception of risk when no such event had occurred. Nonetheless we accept that some local residents are clearly fearful of the impact of the proposal. This fear has to be assessed against the fact that the residents of Corio, Norlane and North Shore are living in the vicinity of the Shell

Refinery and can be assumed to have reached some degree of accommodation with the risk it presents. It is our view that in the absence of a major incident and given the past good record of Terminals operations on this site, anxiety associated with the proposed development, should it be permitted, will reduce over time.

64. As has already been stated, it is our view that there is strong policy support for the proposed location of a butadiene tank on this site, and the question that needs to be addressed in regard to the planning application is whether the proposal represents a risk to the health and well being of local residents.

Health risks

91. To put the health risk in perspective it should be noted that the maximum ground level concentrations predicted:
- (i) do not occur within the residential area,
 - (ii) are one seventh of the accepted standard to protect human health, and
 - (iii) only have the potential to be reached under favourable weather conditions for a maximum of 60 hours three times a year plus a further three months for one year in 10 when the sphere is being serviced.

Precautionary Principle

140. It was argued by the Council and the objectors that there was insufficient certainty associated with the proposal and that the uncertainty was such that a refusal should be issued in line with the '*precautionary principle*'. We support the philosophy behind the precautionary principle and its application in situations where there is a level of scientific uncertainty with respect to a proposal. We find there is no such uncertainty in the present circumstances. We do not believe there will be any serious irreversible damage to the environment as a result of the location of this facility. The risk assessment that has been carried out for this development has been scientifically based and accepted as such by the expert witnesses called by the Responsible Authority. We find in these circumstances that the application of the principle provides no reason to refuse the proposal.

VICTORIAN CIVIL AND ADMINISTRATIVE TRIBUNAL

ADMINISTRATIVE DIVISION [2005] VCAT 1988

PLANNING AND ENVIRONMENT LIST VCAT REFERENCE NOS. P3601/2004 & P1354/2005
PERMIT APPLICATION NOS. 1363/2004 & WA57306

CATCHWORDS

Planning and Environment; storage of Butadiene chemical; characterisation of use; whether use or development permit required; construct sphere in existing chemical storage facility in Special Use 6 Zone abutting Geelong Port; strong state and local policy supporting port related activities; shipped butadiene stored prior to delivery to manufacturers; site abuts petroleum refinery; public health and safety; cumulative impacts; individual risk, societal risk.

Environment Protection; Works approval; Butadiene carcinogenic chemical; Class 3 indicator; consistency with State Environment Protection Policy Air Quality Management; limit of discretion under *EPA Act*.

P3601/2004 – Under the *Planning and Environment Act 1987*

APPLICANT Terminals Pty Ltd

RESPONSIBLE AUTHORITY Greater Geelong City Council

RESPONDENTS Geelong Community for Good Life Inc and Others

P1354/2005 – Under the *Environment Protection Act 1970*

APPLICANTS Peter Linaker and Others

RESPONSIBLE AUTHORITY Environment Protection Authority

RESPONDENT Terminals Pty Ltd

SUBJECT LAND 40 Wharf Road, Corio

HEARING TYPE Hearing

BEFORE Tonia Komesaroff, Presiding Member Dr S. Mainwaring,

Member
DATE OF HEARINGS 18-21 April, 18 August – 7 September 2005
DATE OF ORDER 22 September 2005

ORDER

P1354/2005 – EPA Works Approval

1 The EPA is directed to amend Works Approval No. 57306 issued on 17 May 2005 as follows: □

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1 Item No. 4 *Plan of Premises* must be substituted with two plans numbered **G-AP-0002 Rev K & G-AP-0009 Rev A**.

2 The following condition (e) must be added to condition 3.1:

An emergency response plan which includes details of an annual communication plan to residents within the broader North Geelong/Corio area.

3 Condition 3.11 must be amended to read as follows:

The occupier must undertake baseline and operational ambient air monitoring for butadiene and report to EPA in accordance with the following:

Background Concentrations

Samples will be collected at four locations within the community on five separate occasions including at least the first occasion on which the combustor is in operation.

Potential monitoring locations, subject to approval of property owners and leaseholders, and appropriate monitoring equipment security arrangements, include the following:

- Geelong Grammar School;
- Corio Health Centre;
- Rosewell Primary School;
- North Shore Primary School;
- Corio Village Community Health Centre.

Monitoring programme results will be used to supplement available 1,3-butadiene concentration data from EPAV for the Corio area, for comparison with data for Melbourne and other Australian cities.

Worst Case Emission Monitoring

Monitoring of butadiene concentrations will be conducted during “*worst case*” emission events (wharf line purging after ship unloading) until such time as monitoring conditions are included in the amended licence.

Three locations will be monitored:

- Upwind from the combustor (1 location);
- Downwind from the combustor (2 locations).

Downwind sampling locations will be determined by modelling the dispersal of emissions to air from the combustor utilising the forecast temperature, wind speed and wind direction on the anticipated sampling date.

The modelling will be conducted on the day prior to the anticipated sampling date, using the AUSPLUME gaussian plume dispersion model, in accordance with the requirements of the State Environment

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Protection Policy (Air Quality Management), and published modelling guidelines.

The predicted 9.00 a.m. and 3.00 p.m. peak ground level concentration contours will be used to select the two sampling locations, at or beyond the Terminals Pty Ltd site boundary.

Exact sampling locations will be dependent on site availability, property owner/leaseholder approval and equipment security.

Monitoring Methodology

Sampling will be conducted utilising evacuated SUMMA electropolished stainless steel canisters, in accordance with U.S. Environmental Protection Agency Method No.'s TO14A and TO15.

Samples will be collected in accordance with EPA protocol.

Analysis for butadiene will be by a gas chromatograph equipped with a mass spectrometer (GC/MS).

The results must be made available to the Terminals Geelong Community Consultative Meeting at the next meeting.

ORDER

P3601/2004 – PEA Planning Permit

A permit is granted and directed to be issued by the Responsible Authority under the provisions of section 85(1)(b) of the *Planning and Environment Act 1987* for the land at 40 Wharf Road, Corio which allows **the construction of a chemical storage facility storing 1,3 butadiene generally in accordance with the Drawings numbered G-AP-0005 Rev A, G-AP-0002 Rev K & G-AP-0006 Rev A which, when endorsed by the Responsible Authority, form part of this permit.** The Tribunal directs that the permit must contain the following conditions:

- 1 The development as shown on the endorsed plans must not be altered without the written consent of the Responsible Authority.
- 2 Once the development has started it must be continued and completed to the satisfaction of the Responsible Authority.
- 3 The site including all buildings, works and landscaping shall be maintained in a neat, tidy and safe condition in accordance with the endorsed plans to the satisfaction of the Responsible Authority.
- 4 Prior to the commencement of the buildings and works a stormwater management plan shall be prepared for the site the subject of this planning application which outlines the treatment of all stormwater runoff in accordance with current industry best practice to the satisfaction of the Responsible Authority. The stormwater management plan shall be prepared by a specialist engineer and submitted to the Responsible Authority for approved as part of this permit.

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VCAT Reference No. P3601/2004 and P1354/2005 Page 3 of 34

- 5 The site shall be drained to the satisfaction of the Responsible Authority and no stormwater, sullage, sewerage or polluted runoff shall drain or be discharged to any adjoining properties.
- 6 No polluted stormwater runoff shall be permitted to drain or be discharged to Corio Bay or contaminate the local groundwater.
- 7 The use and development must comply with the requirements of the *Dangerous Goods Act the Dangerous Goods (Storage and Handling) Regulations 2000* and the *Occupational Health and Safety (Major Hazard Facility) Regulations 2000*.

- 8 Fire fighting equipment shall be provided and maintained on the property at all times to the satisfaction of the Responsible Authority.
- 9 The operator under this permit must use its best endeavours to ensure that trucks transporting the butadiene travel north along Shell Parade to the Princes Freeway.
- 10 The Terminals Geelong Community Consultative Committee must meet every two (2) months or such period as agreed by its members, to serve as a community monitoring and communication process for the project, to the satisfaction of the Responsible Authority.

VicRoads

- 11 Vehicular access to the property from Wharf Road must be constructed/extended and sealed to a standard approved in writing by VicRoads the Responsible Authority prior to the commencement of construction within the declared road reserve or the development coming into use.
- 12 Commercial vehicles attending the proposed development must be able to enter and depart the site in a forward direction
- 13 On completion of access works within the declared road reserve, the main road edge line must be delineated by line marking around the bend adjacent to the vehicular access.
- 14 Prior to commencing work within the declared road, the developer must:
 - i Provide evidence that the developer/developer's contractor has a public liability insurance for at least \$10 for the duration of the proposed works.
 - ii Demonstrate that all works will be administered in accordance with quality assurance principles.
 - iii Ensure that work site practices are in accordance with the VicRoads Roadworks Signing Code of Practice.



VCAT Reference No. P3601/2004 and P1354/2005 Page 4 of 34

Environment Protection Authority

- 15 Prior to the commencement of construction, the developer shall obtain a Works Approval under the *Environment Protection Act 1970* from the Environment Protection Authority.
- 16 The development must be conducted in accordance with any Works Approval issued by the Environment Protection Authority.

Expiry

- 17 This permit will expire if one of the following circumstances applies:
 - a The development is not started within two years of the date of this permit;
 - b The development is not completed within two years of the date of commencement.

The Responsible Authority may extend the periods referred to if a request is made in writing before the permit expires or within three months afterwards.

Tonia Komesaroff Sylvia Mainwaring
Presiding Member Member



VCAT Reference No. P3601/2004 and P1354/2005 Page 5 of 34

APPEARANCES:

For Terminals PL Mr J Gobbo QC with Mr P Chiappi of Counsel instructed by Ms Tamara Brezzi of Deacons. Mr Gobbo QC called the following expert witnesses:

- Mr Jamie Govenlock, Town Planner Urbis JHD
- Mr Stephen Lewis of Qest Risk Assessment Consulting
- Mr Roger Drew, Toxicologist
- Mr Frank Fleer, Chemical Engineer
- Dr D Barton, Medical Physician

For Responsible Authority Mr A Southall QC with Mr J Kane of counsel by direct brief. Mr Southall called the following expert witnesses:

- Mr M Jarman, Risk Assessment Engineer
- Dr Dunt, medical doctor
- Mr H Grynberg, URS Environmental Chemical Engineer

and subpoenaed the following witnesses:

- Ms Julie Eichner (DHS)
- Mr Alexander Jovicic (EPA) to produce Shell Wharf audit
- Mr Marcus Mulcare (Parsons Brinkerhoff employee)

For EPA Mr Gerald Purcell of Counsel instructed by Ms Lucy King EPA solicitor. Mr Purcell called:

- Mr John Williamson, Senior Manager, Regional Services, EPA
- Mr Quentin Cooke, Chemical Engineer EPA
- Mr Geoff Cooke, WorkCover referral authority
- Ms Victoria Lynch, Toxicologist, DHS
- Mr Paul Torre, EPA chemist and air sampler

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VCAT Reference No. P3601/2004 and P1354/2005 Page 6 of 34

For third party objectors Mr Peter Linaker in person. Mr Linaker showed a CFA video by John Wynn firefighter.

Ms Sue McLean and Joe Cicero for Geelong Community for Good Life Inc. who called the following expert witnesses:

- Mr Chris Mardon, Chemical Engineer (Retired CSIRO Scientist)

And the following lay witnesses:

- Ms Francesca Dezelak - SMOG (Special Monitor of Geelong).

Ms Margrette Lewis for North Shore Residents Group. Ms Lewis called

- Mr Frank Parsons, Wellness scientist,

Mr John Bowman (Power Point Presentation)

Ms Sue Kelly Turner for Geelong Community Forum Inc
Mr Bill Aitken
Mr John Wilson
Mr Col Edwards using overhead projector
Ms Catherine Jones, Bellarine Seastar
Ms Joan Lindross - Geelong Environmental Inc
Mr Andrew Moore for Geelong Grammar School
Ms Barbara Tilden. Ms Tilden called
· Mr Max Hutchinson
· Mr Benjamin Murphy
· Ms Christie Marsh-Trombelli

Ms Gaye Coles
Mr Ken Govas in person
Ms Kitty van Wies-Miller

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VCAT Reference No. P3601/2004 and P1354/2005 Page 7 of 34

REASONS

INTRODUCTION

- 1 This is the continuation of the April planning review P3601/2004 hearing reconvened to involve all persons who indicated they wish to be a party by lodging statement of grounds. It is also the review of EPA's works approval by objectors.
- 2 The planning review has been brought by Terminals against council's failure to grant it a planning permit for butadiene storage. Council and objectors review relates to the EPA works approval issued to Terminals for the aforesaid butadiene storage.
- 3 Interim reasons were given by the Tribunal on 29 April 2005 for their characterisation of the facility as a warehouse, requiring re-advertising and inclusion of third parties in the planning review.
- 4 The planning and works approvals reviews against a butadiene chemical storage facility have excited considerable public angst and objection among the Corio and Geelong community.

PRELIMINARY MATTERS

- 5 Mr Purcell sought the removal of figure 2 in the works approval and substitution with plans figures 3 and 4 for the *Plan of Premises* forming part of the works approval No. 57306, as attached to John Robert Williamson witness statement. This effectively included the pier carrying the butadiene pipe in the works approval.
- 6 Mr Gobbo QC applied to amend Qest's risk assessment Stephen Lewis expert witness report by adding a table of societal risk calculations FN curve, a societal risk and FN curve table for Terminals, and two conclusions on societal risk and escalation risk (domino effect).
- 7 Both amendments were made without objection by any party.

SUBJECT SITE AND SURROUNDING AREA

- 8 The subject site comprises an irregular parcel of land of some 7.78 hectares in area with a 200m frontage to Wharf Road. Land to the north of the subject

site on the opposite side of Wharf Road is occupied by the Shell Refinery. The site has an abuttal to the north-east to Refinery Pier and to the south-east to Corio Bay. The southern abuttal of the land is to the Shell Outfall Channel. The Channel has a boom located at its mouth directed at controlling accidental spills.

9 Further to the west of the site is, the head office of Chiltern Salt, the Ford casting plant and the railway line. Further to the south are located the BP Wire Mill and Pivot Fertiliser. Beyond the Shell Refinery land to the north is the Geelong Grammar School and beyond the industrial uses to the south and west are residential properties. All of the residential properties are

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VCAT Reference No. P3601/2004 and P1354/2005 Page 8 of 34

located beyond a 1km radius from the subject site, however a number of dwellings to the west fall within a radius of 1.5km with a significantly greater number of dwellings within the 2km radius to the south, north and west of the location of the proposed tank including parts of Geelong Grammar School.

PLANNING PERMIT APPLICATION

10 Council received the application for permit for:

Alterations and additions to an existing chemical storage facility
on 13 October 2004.

- 3 11 The storage facility as proposed is for a spherical tank with a capacity of 4,000 cu metres to contain Butadiene which will be brought to the facility by ship held in the tank under pressure at reduced temperature and distributed to the end users by truck. The proposal includes a pipeline from the wharf, associated pumps, truck loading system, a combustor to handle vapour emissions, a refrigeration unit and a 3km roadway and security fencing.
- 4 12 We were informed there would be three butadiene shipments per year to the site each of 2,000 tonnes and a maximum of two deliveries from the site by road tanker per week. The time taken to unload the ship was given as approximately 10 to 12 hours and for filling each road tanker some 30 minutes.
- 5 13 The application was referred to VicRoads, the Environment Protection Authority (EPA) and the Victorian WorkCover Authority (WorkSafe).
- 6 14 VicRoads responded by letter dated the 16th of November 2004 that it had no objection to the issue of a permit subject to the inclusion of a number of conditions.
- 7 15 The EPA stated by letter dated 8 December that it had no objections, noting that it had informed the applicant that a works approval would be required for the proposal and that as at 8 December 2004 no works approval application had been made.
- 8 16 It was Council's submission that a works approval application was made in approximately late December 2004 and that it had formally objected to the grant of a works approval on 1 April 2005. The works approval was issued by the EPA on 17 May 2005. The works approval was conditional on a planning permit being issued.
- 9 17 EPA in its letter to Council dated 8 December 2004 required Council to include a permit condition requiring that a works approval be obtained prior to construction commencing.
- 10 18 The EPA letter also explained the criteria applying to the EPA's consideration of a Works Approval Application including the proposal's compliance with the Air Quality Management State Environment Protection

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VCAT Reference No. P3601/2004 and P1354/2005 Page 9 of 34

- Policy SEPP (AQM). EPA noted that it is a requirement of the SEPP (AQM) that generators of new sources of emissions must apply best practice to the management of those emissions, and that emissions of substances classified as Class 3 indicators which includes butadiene are reduced to the Maximum Extent Achievable.
- 19 Council also referred the matter internally to their Environment Officer, Traffic Engineer, Engineering Services.
- 20 Council's Environment Officer expressed concerns with respect to the lack of information relating to stormwater runoff and discharge and questioned why such a sphere could not be established in Melbourne, such as at Coode Island or Altona on the basis that the major client for the chemical had been stated to be Australian Vinyls in Laverton which was closer to the chemical storage areas west of Melbourne than Corio. Such a location it was claimed would reduce the number of trucks transporting the material on the Geelong Melbourne Freeway which was a consideration both environmentally and from a traffic safety perspective.
- 21 Council's Traffic Engineer noted that the storage facility would generate a maximum of two vehicles entering and exiting the site on a weekday and that such a low traffic generation would not be likely to have any impact on the surrounding road network. The Engineer also expressed a desire for more detailed information with respect to internal roads that would facilitate truck manoeuvres within the site.
- 22 Engineering Services had no objection to the proposal subject to conditions relating to stormwater collection and drainage.
- 23 The Council at this time believed that although there was no requirement for them to advertise the proposed development, it was appropriate to do so to give the community an opportunity to view the application prior to a decision being made. As a consequence 10 responses were received. The responses focussed on concerns about the risks associated with exposure to butadiene on human health and the potential for a catastrophic emission of butadiene resulting in an explosion with the possibility of knock-on effects from the VCM storage tanks or the adjacent refinery. Concerns were also expressed regarding the transport of the product and the absence of an adequate emergency response plan.
- 24 The applicant lodged an appeal against failure on 29 December 2004. The Responsible Authority subsequently resolved, despite a recommendation of the Planning Officer to the contrary, that were it in a position to do so, it would have issued a Notice of Decision to Refuse a Permit on the following grounds:
- (a) The development will be detrimental to the broader environment.
 - (b) The proposal provides an unacceptable risk to the community.

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VCAT Reference No. P3601/2004 and P1354/2005 Page 10 of 34

- 25 The Tribunal determined at the end of the April hearings that the proposal was best defined as a chemical storage facility coming under the general heading of Warehouse and that as a consequence a permit was required for buildings and works and the notification provisions of the Planning Scheme apply.

PLANNING CONTROLS AND POLICIES

- 26 Council's case with respect to the planning application was presented at the April VCAT hearing by Ms Quigley SC. Mr Southall QC in presenting Council's case in April with respect to both appeals adopted Ms Quigley's submission in the planning matter.
- 27 The subject site is zoned Special Use Zone Schedule 6 – Port Areas. The purpose of the zone is to:
- Provide for the development of the Geelong Port as a key area of the

State for the interchange, storage and distribution of goods.

Provide for uses which derive direct benefit from establishing of the port.

11 28 The State and Local Planning Policy of relevance to the development is as follows:

State Planning Policy Framework Provisions

Clause 11 Introduction, Goals and Principles

Clause 13 Principles of Land Use and Development Planning

Clause 14 Settlement

Clause 15 (in particular 15.04 and 15.08) Water Quality, and Coastal Areas

Clause 17 Economic Development

Clause 17.03 Industry

Clause 18.01 Declared Highways, Railways and Tramways

Clause 18.05 Ports

Local Planning Policy Framework Provisions

Clause 21.02 Geelong in Perspective

Clause 21.05 Planning Principles

Clause 21.10 Environmental Management

Clause 21.19 Economic Development

Clause 21.22 Industry

Clause 21.29 Ports

Clause 22.14 Corio Bay Foreshore Policy

Clause 22.15 Industrial Development Design and Siting

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VCAT Reference No. P3601/2004 and P1354/2005 Page 11 of 34

29 The use is categorised under the provisions of Clause 52.10 *'Uses with Adverse Amenity Potential'* as *'storage of bulk volatile organic compounds in quantities greater than 1,000 tonnes'* with threshold distance of 1,000m required. The threshold distance is the minimum distance of the land from a Residential Zone and the table carries a note with respect to the use that an assessment of risk to the safety of people located off the land may be needed. In any event the threshold distances are met by the proposal even though the proposal does not require a use permit.

30 There is overwhelming support in both the State and Local Planning Policy for the development of the use on the site as a port related use.

31 The policy support in Clause 21.29 is blunt with respect to the Port of Geelong:

It is the sixth largest port in Australia in terms of tonnage, the major grain handling terminal for the State, and provides specialist infrastructure for bulk handling.

Direct freight movements within and between industrial areas and port and rail infrastructure is critical to industry growth and efficiency. The Geelong Port has specialised bulk handling facilities with the capacity to expand turnover. Better linkages to the standard gauge rail will expedite this with consequent improvements in amenity resulting from the reduction of road haulage across and through the City.

To maintain this competitive advantage it is imperative for Council to ensure that future use and development of the Port and surrounding industrial land is linked and opportunities protected.

12 32 Clause 22.14 which deals with the Corio Bay includes among its objectives the following for the port area precinct containing the subject site:

Protection and enhancement of port related development opportunities in the vicinity of Geelong Port.

13 33 The Geelong Port Strategic Land Use Plan (SLUP) was commissioned in 2001 by a partnership established between Toll of Geelong Port and the Department of Infrastructure. A draft Strategic Land Use Plan was released in August 2004 for community comment. This draft document places the subject site within the core study area and the associated land use map identifies the subject site within the *liquids* land use category. The intent of the SLUP as summarised by Ms Quigley SC is to:

- Ensure the security of the port's future
- Provide guidance to the port manager and operators in their business planning to 2020
- Provide direction for land requirements for port related development
- Simplify the planning approvals process for port related development

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VCAT Reference No. P3601/2004 and P1354/2005 Page 12 of 34

- Ensure that appropriate buffers are provided around port operations and
- Integrate outcomes and recommendations of the SLUP with the Corio Bay Coastal Action plan and other planning requirements.

34 The SLUP was initially released by the Department of Infrastructure in August 2004 for a one month consultation period. That period was extended to six months, at the request of the City of Greater Geelong, for community comment.

35 Ms Quigley SC drew the Tribunal's attention to the specific recognition in the SLUP for the potential conflicts associated with the juxtaposition of the residential and industrial areas leaving little opportunity for *appropriate buffers* between them:

Not only do existing residents close to the port create constraints on port related and industry related activities, the predicted growth in port activities over the next decade will increase this conflict, with the risk of greater constraints being imposed on the port, industry and their associated transport activities in order to protect nearby residential amenity.

14 36 It was Council's contention that there was no direct comment on the suitability of the port for major bulk liquid storage in the SLUP. This is not the case. Bulk liquids receive specific mention with respect to the function of refinery pier. Aside from the notation on the land use map already mentioned, bulk liquids are specifically referred to in Section 2.2 of the document and Terminals Company Limited/Chemicals identified as a major port use in Section 3.1.3.

15 37 We would also comment with respect to the storage of organic liquids that a major occupant of the Special Use Zone already is the Shell Refinery whose primary activity is distilling, tracking, storing and transferring to tankers, volatile organic compounds.

16 38 The Responsible Authority submitted that it recognised the economic and employment benefits of the port and supported the concept of the overall strategy plan but was of the view that in further developing the SLUP for the Port of Geelong the Department should undertake greater consultation with stakeholders including the local community and address environmental social, cultural as well as environmental issues in preparing a revised plan.

17 39 The Tribunal was informed by Mr Southall QC at the hearing's recommencement in August that such further consultation with the local community would take place post exhibition of an amended document. It was his view that permitting the proposed storage facility could be a bad precedent in the absence of the final SLUP.

18 40 We do not accept the position put by the Responsible Authority. In our view the SLUP does not represent a seriously entertained planning policy at this point in time and in any event, in its existing form, offers strong

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VCAT Reference No. P3601/2004 and P1354/2005 Page 13 of 34

support for the proposed development. We agree with the position put by Mr Govenlock that there is ample guidance in the Geelong Planning Scheme to adequately assess the planning merits of the proposal and that overall there is strong policy support for the location of the facility on this site.

41 The proposed development is dependent on the Port, consistent with the zoning and the existing use of the subject land and adjoining land (Shell) and encouraged by the policy provisions of the Planning Scheme. We find that only limited weight should be placed on the SLUP which in any event, in our view, is unlikely in its final form to result in a major change in policy direction with respect to the Port.

42 It remains therefore to determine whether there is an unacceptable risk to the community and the environment associated with this proposal. Our assessment of the evidence in this regard is dealt with later in this determination.

NET COMMUNITY BENEFIT

43 The Responsible Authority raised the issue of net community benefit with respect to the proposed storage tank. Net community benefit is contained in the State Planning Policy Framework at Clause 11.01 which states as follows:

It is the State Government's expectation that planning and responsible authorities will endeavour to integrate the range of policies relevant to the issues to be determined and balance conflicting objectives in favour of net community benefit and sustainable development.

19 44 It was argued by the objectors that there was no net benefit to the Geelong community as a result of this proposed development. We were informed that there was only one user of butadiene in the Geelong area, namely Godfrey Hirst and Brittan's Carpets, the main recipients being DOW and BASF. It was argued that placing the storage facility in the Port of Geelong offered no benefit to residents and increased the overall risk as a result of tanker movements out of the port to deliver the material to the users in Melbourne. We are of the view that net benefit has to be considered on a wider scale, there will be some employment opportunities, albeit limited associated with the proposal. Further there will be benefit to the Port Phillip Air Shed. In particular, the contribution of industrial sources of butadiene will reduce from 4.5% of the total Butadiene emissions in the air shed to 0.25% as a result of the shutting down of the Qenos Altona manufacturing plant and the installation of the Terminals facility. This emission represents 0.04% of the total butadiene emissions to the Port Phillip Air Shed. In the Tribunal's view these figures indicate an overall net benefit and also provide a perspective on the magnitude of what is being proposed here.

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VCAT Reference No. P3601/2004 and P1354/2005 Page 14 of 34

WORKS APPROVAL APPLICATION

45 The Terminals works approval application was received by the Environment Protection Authority on 23 December 2004. The application was accompanied by a report from Air Water Noise (AWN) Company Limited which included a description of what was proposed in significantly more detail than contained in the planning appeal application. The application included details of equipment, modelling of ground level concentrations from butadiene, carbon monoxide and nitrogen dioxide emissions, greenhouse gas assessment, waste and waste water management, environment risk assessment and environment management monitoring details.

46 The application was advertised in major newspapers circulating in the area and

as a consequence eight written submissions and 49 proforma letters were received together with two petitions.

- 47 On 21 March the inaugural Terminals Geelong Community Consultative Committee (GCCC) met for the first time. The meeting was attended by the EPA. Subsequent meetings were held on 11 April, 9 May, 7 June and 17 July 2005. On 7 April 2005 the EPA convened a 20B conference under the provisions of the *Environment Protection Act* 1970 which included presentations from the authority and from Terminals as well as community members. This meeting was attended by Ms Julie Eichner of the Department of Human Services.
- 48 The EPA subsequently issued notices pursuant to Section 22(1) of the Act on 14 April and 20 April respectively which were responded to by AWN Consultants, in a report of 21 April and a letter dated 22 April 2005. AWN emailed the authority with respect to errors in the works approval application calculation for greenhouse gas emissions on 27 April 2005.
- 49 The Department of Human Services (DHS), Worksafe Victoria and the City of Greater Geelong are all referral authorities with respect to the proposed works approval. Worksafe advised the authority that it had no objection to the proposal.
- 50 The initial response from DHS by letter of 12 April 2005 was somewhat obscure and in particular recommended that
- The Health Impact Assessment Report being commissioned by Councillors [the Dunt Report] was given due consideration before finalisation of the works approval application
- without any specific statement as to whether they objected or not.
- 20 51 DHS subsequently by letter on 21 April 2005 recommended that EPA not issue the works approval until outcomes of the VCAT process that relate to the Health Impact Assessment Report were available and had been considered by DHS and EPA. As events came to pass the earlier planning application appeal was not completed but joined with the works approval application and heard together in the present proceedings.
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- VCAT Reference No. P3601/2004 and P1354/2005 Page 15 of 34
- 52 EPA sought a definitive answer from the DHS as a matter of urgency. The response was received in a letter dated 4 May 2005 indicating no objection to the proposal and referring back to the comments and recommendations set out in the original letter of 12 April, 2005.
- 53 The City of Greater Geelong as a consequence of the correspondence between EPA and DHS sought to establish that there had been a reliance on the part of DHS on the Health Impact Assessment Report provided by Dr Dunt at the request of the council. Mr Southall QC asserted that DHS could not have come to the conclusion they did if they had properly considered Dr Dunt's report, so DHS support for the proposal was consequently invalid.
- 54 We are satisfied on the evidence of Ms Victoria Lynch and Ms Julie Eichner that DHS did not rely on the Dunt Report in coming to its decision, which, in the Tribunal's view, was made at the time of their first letter of 12 April, although not explicitly or clearly expressed.
- 55 We are also of the view that there were no improper communications between Mr Marcus Mulcare, the EPA Officer who had carriage of the works approval application at that time and any employee of the Department of Human Services and that the decision made by DHS was made independently.
- 56 The authority issued works approval No. WA57306 on 17 May 2005 conditional upon a planning permit being obtained by the permit applicant. The application for review was subsequently made to VCAT by the City of Greater Geelong and the third party objectors outlined in the appearance list.
- 57 The grounds put forward by the City of Greater Geelong were as follows:

If the works are completed in accordance with the works approval a use

of the works may result in a discharge of waste which will adversely affect the interests of the applicant and the works approval is contrary to the relevant SEPPs.

- 21 58 The grounds put by the third party objectors although somewhat more extensive were essentially the same.
- 22 59 A Directions Hearing was held on 15 July 2005. The order of the Tribunal at that time set out a number of matters relating to the conduct of the hearing including a requirement that all applicants for review in the works approval application provide further and better particulars of their grounds of review under the provisions of the *Environment Protection Act 1970*.

Environment Protection Act Appeal Provisions

60 The provisions of the *EPA Act 1970* that are relevant to the present matter are contained in Section 33B and state as follows:

- (1) If the Authority or a delegated agency –
(a) issues a works approval;

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VCAT Reference No. P3601/2004 and P1354/2005 Page 16 of 34

a person whose interests are affected by the decision (other than the applicant or licence holder) may apply to the Tribunal, within 21 days after the decision is made, for review of the decision.

- (2) an application for review under sub-section (1)(a) is to be based on either or both of the following grounds -
- (a) that if the works are completed in accordance with the works approval, the use of the works will result in a discharge, emission or deposit of waste which will unreasonably and adversely affect the interests, whether wholly or partly of that person;
- (b) that if the works are completed in accordance with the works approval, the use of the works will result in a discharge, emission or deposit of waste which -
- (i) will be inconsistent with State environment protection policy established for the area in which the discharge, emission or deposit will occur; or
- (ii) where there is no State environment protection policy established for that area, would cause pollution.

61 The hurdle contained in Clause 33B is very high in the sense that if the works *are* constructed in accordance with the works approval it is incumbent on the objectors to establish that the use of the works *will* result in a discharge, emission or deposited waste that will unreasonably and adversely affect the interest whether wholly or partly of that person or will be inconsistent with State Environment Protection Policy.

ISSUES

62 The proposed development has resulted in a significant level of concern on the part of local residents in the immediate area of the subject site and as far away as Queenscliff. We appreciate that there is a genuine fear within the local community and that this fear has been harnessed by a number of community groups. We note the positive impact of the Geelong Community for Good Life Incorporated whose efforts have resulted in an upgrading of the operations at the Shell Refinery including increased community consultation directed towards reducing emissions and improving safety practices for the greater good of the community as a whole. We do however

have reservations about the impact of the media hype that has surrounded this proposal and the impact that this has had on enhancing the fears of the local community to an extent that is out of touch with the realities of the potential impact of the proposed development.

63 One of the issues raised by Dr Dunt in his expert witness report was the impact that this proposal could have on community health, as a consequence of stress within the community engendered by fear of the risk the proposed development represents. He provided the Tribunal with a

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VCAT Reference No. P3601/2004 and P1354/2005 Page 17 of 34

number of references with respect to the impact of exposure to chemical contamination on the psycho-social status of individuals and communities. He acknowledged that the studies quoted dealt with risk perception in the aftermath of catastrophic events.

64 No evidence was provided to us of any long term health effects associated with the perception of risk when no such event had occurred. Nonetheless we accept that some local residents are clearly fearful of the impact of the proposal. This fear has to be assessed against the fact that the residents of Corio, Norlane and North Shore are living in the vicinity of the Shell Refinery and can be assumed to have reached some degree of accommodation with the risk it presents. It is our view that in the absence of a major incident and given the past good record of Terminals operations on this site, anxiety associated with the proposed development, should it be permitted, will reduce over time.

65 As has already been stated, it is our view that there is strong policy support for the proposed location of a butadiene tank on this site, and the question that needs to be addressed in regard to the planning application is whether the proposal represents a risk to the health and well being of local residents.

66 The Tribunal accepts the argument put by Mr Gobbo that the Tribunal's consideration of the planning issues is limited to the impact of the buildings and works and consequently ship and road transport do not fall within the Tribunal's ambit of discretion. The Tribunal however notes that road and sea transport are covered under other legislative regulation and requirements. Further neither of these activities are themselves substantially different in kind from activities already operating within the Port of Geelong ie shipment of chemicals into the port and transfer of chemicals by tanker away from the port, with the materials being handled not having substantially different risk profiles to butadiene.

67 The potential risks associated with the butadiene storage tank is also relevant in terms of its potential to impact on health and well being of adjoining residents to the works approval with respect to test contained at Section 33B(2)(a) of the *EPA Act*.

68 Butadiene is an organic gas at standard temperatures and pressures which forms a potentially explosive mixture with air. The gas is intended to be held as a liquid in the storage tank proposed under the pressure of some 75 kPag at a temperature of less than 10°C.

69 Butadiene is classified as a probable human carcinogen by the International Agency for the Research on Cancer which places it within Group 2A, this is the same classification that applies to Vinyl Chloride monomer which is also already stored in spherical tanks on the Terminal's site. Butadiene is classified as carcinogenic and geno toxic to humans by the International Program on Chemical Safety (IPCS) along with VCM and is designated a Class 3 indicator under the SEPP Air Quality Management (AQM). A Class 3 indicator being *an extremely hazardous substance that may threaten*

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VCAT Reference No. P3601/2004 and P1354/2005 Page 18 of 34

the beneficial uses of the environment due to its carcinogenic mutagenic,

teratogenic, highly toxic or highly persistent characteristics.

- 70 The potential health impacts of butadiene arise from chronic or long term exposure to gaseous butadiene in the atmosphere and short term high exposure from catastrophic events such as the total loss of the total content of the storage vessel as a cold gas release or ignited as a BLEVE (Boiling liquid expanding vapour explosion).

CHRONIC HEALTH IMPACTS

- 71 The potential for chronic impacts on human health associated with the proposal arises from the increase in the background concentration of butadiene in the atmosphere under normal operating activities on the site.
- 72 The major release of butadiene to air emission comes from the combustion of residual butadiene left in the pipeline after unloading from the ship has been completed. Under normal operating conditions this activity will take place on three occasions per year and, for the size of combustor proposed at this point in time, will continue for some sixty hours each time.
- 73 The combustion rate is limited by the capacity of the combustor which operates at 150 kg per hour with a guaranteed minimum efficiency of 99.6%. It was Mr Fleer of AWN Consultant's evidence that the supplier of the equipment was of the view that the minimum destruction efficiency would be much higher than this, more in the order of 99.9%.
- 74 AWN Consultants carried out a modelling exercise using AUSPLUME version 5.4 in accordance with EPA recommendation. The modelling results gave a maximum predicted ground level concentration of butadiene of 0.01 milligrams per cubic metre (in three minute average 99.9 percentile) or 0.0045ppm. This value is a factor of seven less than the design criteria for butadiene set out in the SEPP (AQM) of 0.073 milligrams per cubic metre (0.033 ppm). The concentration profile showed the maximum concentration contours clustered around the storage facility with the highest values being to the north and north-east away from the residential area. Dr Grynberg who was called to give evidence on behalf of the Responsible Authority confirmed the accuracy of the model calculations.
- 75 Among the assumptions made in the model inputs was a setting of the background concentration for butadiene of zero. This figure was based on background butadiene monitoring results conducted by AWN Consultants in Ringwood where concentrations found were less than the limits of detection of the method used.
- 76 There was significant scepticism on the part of the objectors regarding the existing background levels of butadiene in the area which in their view should have been much higher based on values obtained by them for sites adjoining roads and refineries in the United Kingdom and USA.

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VCAT Reference No. P3601/2004 and P1354/2005 Page 19 of 34

- 77 Additional background levels data was provided at the hearing by EPA's Dr Paul Torre obtained in a monitoring program carried out by him in the Corio Bay area. Dr Torre's results indicated that levels of butadiene in the air shed were on all but one occasion below the detection limit of the method used of .003 parts per million.
- 78 The Geelong Community for the Good Life called evidence from Mr Christopher Mardon, a retired Chemical Engineer, with experience in chemical analysis. Mr Mardon's report concentrated on issues of quality control associated with the ambient monitoring of benzene in the local air shed (Tribunal emphasis). In verbal evidence given at the hearing, however, he informed us that given the instability of butadiene in the atmosphere (half life 1 to 9 hours) the canister method used by the EPA for collecting samples over a 24 hour period prior to analysis would give inaccurate results for the atmospheric concentration of butadiene and that light path measurement or

solid absorbent collection would be preferable.

- 79 The method of collection and analysis as used by Dr Torre was the USA EPA method TO15, which according to information provided to the Tribunal does appear to be a certified method for the measurement of butadiene among other organic gases.
- 80 We accept that there is a level of uncertainty associated with the butadiene measurements provided by the EPA. The Tribunal however does not consider that the level of uncertainty is such as to invalidate the modelling that has been carried out by AWN. The doubts that the Tribunal has about the method relate to the lack of validation of the stability of butadiene held in the canisters in the field. We note that the EPA monitoring program was directed at determining benzene levels, with butadiene being a secondary consideration at the time.
- 81 We find that there is no evidence to suggest the background levels for butadiene in the air shed are anywhere near the order of the magnitude quoted by an objector Mr Linaker. The Tribunal notes in this regard that Mr Mardon suggested under cross-examination that the background concentration of butadiene in the atmosphere in the vicinity of the Shell refinery would be of the order of 20 to 30 micrograms per cubic metre. This estimate on his part was based on a misapprehension of the relationship of the emissions of butadiene emitted by Shell and the proposed facility. The refinery emission of 230 kg of butadiene spread over a 12 month period, whereas Terminals annual emission of around 100 kg occurs on three separate occasions over a total period of approximately one week. The appropriate comparison is between the weekly emission from Shell and the maximum emission of 100kg from Terminals. The average weekly emission from Shell is therefore approximately 4.4kg or 4.4% of that from Terminals for the worst case emissions used in the model.

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VCAT Reference No. P3601/2004 and P1354/2005 Page 20 of 34

- 82 The Tribunal finds under these circumstances that it can reasonably be accepted that the background level of butadiene in the area is of the order of, or less than .001 parts per million, or .0024 milligrams per cubic metre.
- 83 The proposed development also includes a 1 in 10 year degassing of the sphere for inspection purposes. If the combustor as proposed were to be used for such degassing it would take of the order of three months to complete. It was the view of Mr Quentin Cooke of the EPA, that the combustor appeared to be undersized to deal with the 10 yearly degassing of the sphere. Mr Cooke however accepted that other methods of sphere degassing were available and that was ample time for Terminals to investigate alternative options given that the first sphere degassing will not occur for 10 years. The EPA however did require in their works approval and conditions that the combustor have sufficient capacity to deal with any pressure release of butadiene from the sphere, should the refrigeration system fail. We note that pressure release is an unlikely circumstance given that the sphere is designed to withstand a pressure of 350 kpag and that the normal operating pressure expected is less than 75 kpag. Further the estimated number of days for the sphere to increase to the 41°C internal temperature necessary to reach the design pressure should the refrigeration system fail, is 45 days. That is, the refrigeration system would have to be out of action for a full 45 days when the atmospheric temperature was above 40°C.
- 84 The Responsible Authority's expert, Dr Grynberg, accepted that there could be technological advance in the period prior to the 10-year degassing of the sphere and recommended a decision be made with respect to the methodology to be used, 12 months before the degassing occurs.
- 85 According to the SEPP (AQM) the design criteria has been designed to protect against adverse health effects. The meeting of the criteria is therefore consistent with the SEPP and the protection of the health and well being of nearby residents.

86 Support for the adequacy of the level of health protection associated with the routine operation of the proposed development was provided by Dr David Dunt who appeared on behalf of the Responsible Authority. Dr Dunt gave evidence that there was a reliable study that established a link between leukaemia and butadiene. Dr Dunt calculated the additional cases of leukaemia that might be expected as a result of the predicted ground level concentrations in any one year at 0.02. He acknowledged however that his calculation was particularly conservative in that he assumed the design level criteria (seven times the predicted maximum ground level concentration) would occur in residential areas continuously rather than for a maximum of one week under normal operating conditions. It was acknowledged by him the level of exposure experienced by the community under normal operating conditions should not represent a significant threat to community health in circumstances where the exposure to the increased concentration of butadiene as a result of the storage facility is not

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VCAT Reference No. P3601/2004 and P1354/2005 Page 21 of 34

continuous but under normal operating conditions occurs for at most one week in any one year and for three months/once every 10 years.

87 Evidence of potential health impacts was called by Ms Margaret Lewis on behalf of the North Shire Residents Group from Mr Frank Parsons. The evidence of Mr Parsons of little use to us in our consideration of this proposal. The health effects reported by him related to a correlation between some 18 metal ion concentrations in the human body and various conditions. He had no specific information to provide with respect to butadiene. It was our view that the effects reported by him are not thoroughly established and that the suggestion that butadiene would enhance these effects is completely without foundation.

88 It was put by the objectors, Mr Linaker in particular, that the design criteria contained in the SEPP did not take sufficient account of the most vulnerable in society. The basis of this argument is that the criteria are derived from exposure levels of healthy male workers for eight hours a day and failed to have regard to the elderly and infirm and to children. Ms Vicki Lynch's evidence was that the design criteria are based on the exposure level for workers reduced by a factor of 3 to take account of 24 hour exposure together with a safety factor of 10 to accommodate the additional susceptibility of young children and the elderly and a further 10 for a Class 3 hazardous chemical.

89 We accept that this is standard procedure for providing safety levels for chemical exposure. We acknowledge the level of investigation carried out by Mr Linaker into the potential effects of butadiene on the unborn and the vulnerable including the study by Knox (2005) associating cancer in babies living in proximity to industrial sites. We, however, note the comments of Dr Dunt that the Knox findings are unconfirmed.

90 Mr Wilson had particular concerns about multi-chemical exposure and the additional risk that would follow adding another chemical to the mix. No evidence was provided to us that there was any interactive or cumulative impact on health between butadiene and any other pollutants in the air shed. It was specifically stated by Dr Drew that there was no possibility of interaction between butadiene and nitrogen oxides (NO_x) or small airborne particulates (PM₁₀). We accept the evidence as given.

91 To put the health risk in perspective it should be noted that the maximum ground level concentrations predicted, do not occur within the residential area, are one seventh of the accepted standard to protect human health, and only have the potential to be reached under favourable weather conditions for a maximum of 60 hours three times a year plus a further three months for one year in 10 when the sphere is being serviced.

92 In light of the preceding we conclude that there is no risk to human health associated with the routine storage operation including the flushing out of the

supply lines from the ship and the 10 year degassing of the sphere. There are other smaller sources of routine emissions from this site

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VCAT Reference No. P3601/2004 and P1354/2005 Page 22 of 34

associated with the loading of the tankers which may release butadiene from the dead space of the valve coupling system. No evidence was provided to us that this emission would be significant.

RISK ASSESSMENT

- 93 The potential for a catastrophic event resulting in an acute impact on adjoining residents was assessed in the expert witness report of Mr Stephen Lewis and Mr Steven Cooper of Qest presented at the hearing by Mr Lewis.
- 94 Mr Lewis provided the Tribunal with risk contours derived from an assessment of the consequences coupled with the likelihood of particular events occurring. The contours provided represented the individual risk of fatality or the fatality risk experienced by an individual assumed to be continually present at a specific location, ie. tethered to the location.
- 95 Mr Lewis provided two diagrams each showing the risk contours at the one in 10^{-7} and one in 10^{-5} risk of fatality for the site, with and without the butadiene tank. The 10^{-7} and 10^{-5} levels correspond to the Victorian Interim Risk Criteria. The 10^{-5} or 1 in 100,000 risk per year being the risk not to be exceeded at the plant boundary and the 1 to 10^{-7} contour or the one in 10 million per year being the maximum acceptable risk in a residential area.
- 96 The calculations assume best practice engineering and more specifically maximum extent achievable engineering design as required by the SEPP for Class 3 pollutant and the assumption that the facility would be operated under the Occupational Health and Safety Regulations for a Major Hazardous Facility under an updated Safety Case as required by Worksafe Victoria.
- 97 Two main conclusions can be drawn from the risk profiles, namely: the plant at present does not meet the 1 to 10^{-5} criteria at the boundary and that there is no additional risk at the 10^{-7} level towards the residential areas and only a small change in this contour towards the ocean as a result of the butadiene installation.
- 98 Dr Dunt on behalf of the Responsible Authority, agreed with the estimations made by Mr Lewis and the conclusion taken from them that the risks were within acceptable levels and in particular were consistent with the Victorian Interim Risk criteria at the 10^{-7} level in the far field which evidence was among the strictest in the world.
- 99 Mr Lewis also provided the Tribunal with a societal risk assessment for the proposal. The societal risk assessment was again based on the Victorian Interim Risk Criteria, the level of societal risk being demonstrated on what is known as a FN curve which plots the number of fatalities N against the frequency of N or more fatalities occurring. The plots divide risk into three categories; unacceptable, acceptable or acceptable-but-remedial-measures-desirable. The societal risk curve plotted by Mr Lewis lay predominantly within the risk acceptable region extending into the acceptable-but-remedial-measures-desirable range at a frequency of around 10^{-7} . A plot of

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VCAT Reference No. P3601/2004 and P1354/2005 Page 23 of 34

societal risk with and without the storage facility showed no additional impact would occur.

- 100 Dr Dunt had concerns about the accuracy of the FN curves in the absence of details of the calculations that were made. We are however of the view, and

this was acknowledged by Dr Dunt in cross-examination, that although there is a difference between societal risk and individual risk, if the individual risk is not changed by the addition of the butadiene tank to the site, then the societal risk will similarly not be changed. Mr Lewis confirmed that it is indeed the case the consequence of which is that there will be no increase in societal risk in the far field, ie. in the region most approximate to the residential properties. We are of the view that the individual risk and presumably societal risk in the industrial area and towards the Bay does not present a matter of concern, given that the people likely to be located in these areas will be employees of Terminals, or potentially of Shell and will have been trained in risk avoidance.

- 101 The objectors also had concerns about the potential for interaction between incidents on the site and the Shell Refinery or the other way around. In this regard it was Mr Lewis' evidence that the refinery's safety case found that the consequences of fire or explosion incidents involving hydro carbon liquids or gases or hydrogen within the refinery will be confined within the refinery boundary where it adjoins the Terminals and that the only incidents with the potential to seriously impact on personnel at Terminals involved the release of hydrogen fluoride or hydrogen sulphide. Although the objectors were doubtful of the validity of the assertion that there was no potential for interactive or knock-on events between the refinery and Terminals, we accept the evidence as provided given the circumstance where WorkSafe is in possession of the safety cases for both facilities and expressed no concern in this regard.
- 102 Mr Lewis evidence was that the interactive risk from the refinery could be controlled at the tanker filling facility by the use of a *dead man's* switch, which requires human intervention every 2.5 minutes in order to prevent an alarm system being triggered which automatically closes the operation.

WORST CASE EVENTS

- 103 We were provided with expert evidence as to the worst case impacts of a major failure of the storage tank either as a cold catastrophic failure when a full tank of butadiene is released from the vessel into the surrounding containment bund and is dispersed as a vapour cloud and boiling liquid expanding vapour explosion (BLEVE) as a result of excessive heat by way of a fire or thermal radiation impinging on the tank.
- 104 The worst case consequence of a cold catastrophic failure was modelled by Qest Consulting and provided in the tabled evidence of Mr Stephen Lewis. The results indicated for the worst case weather conditions which occur at some 28% of the time at the site. The ERPG2 concentration of 200

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VCAT Reference No. P3601/2004 and P1354/2005 Page 24 of 34

parts/million would be achieved at a distance of 1,625m from the site with the ERPG3 level of 5,000 parts/million at 900m with higher concentrations being achieved further infield.

- 105 The ERPG2 level is the maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms which could impair an individual's ability to take protective action. ERPG3 is a maximum level in concentration below which it is believed that nearly all individuals could be exposed for up to one hour without experiencing or developing life threatening health effects.
- 106 Dr Drew's evidence was that the ERPG or Emergency Response Planning Guidelines developed by the American Industrial Hygiene Association were too conservative and that a more appropriate standard was the AEGL – Acute Emergency Guideline Limits developed by the National Advisory Committee. It was Dr Drew's view that the AEGL levels were more reasonable being based on the impact of a single short time exposure on

individuals as opposed to the ERPG levels which are based on studies on pregnant rats. The AEGL2 level is defined as the threshold between reversible effects that cause discomfort and serious or irreversible health effects that impair escape. The AEGL2 levels for Butadiene are 6,700 parts/million for a ten minute exposure decreasing to 2,700 parts/million for an eight hour exposure. These values allow for a significant safety margin for susceptible individuals and are based on the low toxicity impact of butadiene on humans, healthy individuals being able to accommodate concentrations of 8,000 to 10,000 parts/million for up to six to eight hours with no effects other than a mild irritation with symptoms readily reversible when the individual is exposed to fresh air.

- 107 Concentrations that individuals would be exposed to as a result of a cold catastrophic failure of the butadiene tank are well within the AEGL2 standard and meet the ERPG2 values. Taking into account these values already have a conservatism built into them to protect susceptible individuals, the Tribunal has no concerns with respect to the capacity of residents to escape should a release occur which, it must be emphasised, is itself a very unlikely event.
- 108 The other community concern with respect to cold catastrophic failure was the potential for short term high level concentrations of butadiene to initiate the development of cancer in humans. It was Dr Barton's evidence that there were no established studies which would suggest there was any increased risk of cancer from a single exposure to an elevated concentration of butadiene. Dr Drew's evidence essentially supported this view. He provided the Tribunal with calculations of the risks of genetic damage, and cancer and reproductive and development toxicity from short-term exposures to butadiene. The calculations relied on experiments carried out on rats and mice. It was his evidence that the way humans metabolise butadiene had more in common with rats than with mice.

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VCAT Reference No. P3601/2004 and P1354/2005 Page 25 of 34

- 109 Dr Drew's conclusions were that there was, on the basis of the rat studies, no evidence that would lead to concern about reproductive and developmental effects as a result of exposure to butadiene of concentrations; no effects having been established in female rats exposed to up to 8,000 ppm of butadiene for two years. The risk of the development of cancer from an acute exposure to the AEGL2 guideline values was of the order of around one in 10 million/year and the risk of genetic damage to male germ cells was for the same exposure levels 0.5 in one million/year. He asserted that authorities in setting public health standards found risks of between 1 in 10^{-6} and one in 10^{-5} acceptable ie one in 100,000 to one in one million.
- 110 In considering these risk levels it should be remembered that the risk of catastrophic failure is very low and that even under worst case conditions if a failure should occur the level of exposure used in Dr Drew's risk assessment is not reached in the residential areas. Further the background risk for inheritable genetic damage is 800 per million.
- 111 We also note that Dr Dunt concluded the impact of short-term high level exposures *are not considered to be a cause* for concern.
- 112 We find that on the basis of the expert evidence provided to us, there will be no impairment on the capacity of adjoining residents to evacuate premises in the unlikely circumstances that this would be necessary, nor potentially trigger a mutagenic or carcinogenic response in any individual as a result of the catastrophic failure of a full tank of butadiene.
- 113 Mr Lewis' evidence with respect to the worst case consequence of a BLEVE occurring at a time when the storage tank was full was for third degree burns at 920m and of second degree burns at 1,100m. It was Mr Lewis' evidence that a BLEVE was an extremely unlikely event given the protection measures in place which include fixed cooling water deluges on the sphere, fire detection activation and the separation distance of the sphere from the VCM

spheres and potential heat sources. Mr Lewis provided the Tribunal with a number of historic or BLEVE events, all of which involved an LPG cloud. He also provided a 40 year history of butadiene incidents. The high degree of unlikelihood of a BLEVE event was confirmed by Dr Dunt in his expert report.

114 It was Mr Lewis' evidence that the most likely failure events on the site would not be the cold catastrophic release of a full tank of Butadiene or a BLEVE but smaller leaks from frequently handled equipment with moving parts such as a pump or a loading hose. He modelled the impact of such leaks together with the likelihood of their occurrence from holes of 5, 25 and 100mm diameter respectively with the release being either ignited as a jet fire, as a spilt liquid fire or a pool fire or dispersed as a vapour cloud. The likelihood of these events ranges from one in 500 for release from a 5mm hole, one in 5,000 for a 25mm hole and one in 10,000 for 100mm hole, none of the events having a serious impact to persons located within

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VCAT Reference No. P3601/2004 and P1354/2005 Page 26 of 34

the residential areas or reaching a short term concentration that would be of any concern.

CONSISTENCY WITH STATE ENVIRONMENT PROTECTION POLICY

115 The State Environment Protection Policy of most relevance to the proposed development is the SEPP Air Quality Management. As discussed previously there are two aspects to the grounds of objection that can be made with respect to the works approval application. We have already concluded that there will be no health risk associated with the operation of the proposed development if it is constructed in accordance with the works approval. It remains to determine whether the proposal is consistent with the SEPP (AQM).

116 Terminals' argued that, as the discharge from the proposal would not exceed the design criteria for butadiene contained in Schedule A of the SEPP, then the proposal was consistent with the SEPP requirements.

117 It was Council's submission that there were some overriding principles contained within the SEPP that should be complied with, most prominently the precautionary principle which states as follows:

- (a) If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
- (b) Decision making should be guided by –
 - (i) a careful evaluation to avoid serious or irreversible damage to the environment wherever practicable; and
 - (ii) an assessment of the risk-weighted consequences of various options.

23 118 It was further Council's submission that the SEPP (AQM) required the construction of the works in accordance with best practice which for Class 3 indicators requires a reduction of emissions to the maximum extent achievable. Best practice is defined as *the best combination of eco-efficient techniques, methods, processes or technology used in an industry sector or activity that demonstrably minimises the environmental impact of a generator of emissions in that industry sector or activity.*

24 119 Maximum extent achievable is *a degree of reduction and the emission of waste from a particular source that uses the most effective practicable means to minimise the risk to human health from those emissions and is at least equivalent to or greater than that which can be achieved through the application of best practice.*

25 120 We find there is some merit in the argument put by Mr Gobbo that consistency with best practice and the maximum extent achievable are matters to be dealt with by the EPA and not open to third party review. This would seem to be particularly so in a works approval application

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VCAT Reference No. P3601/2004 and P1354/2005 Page 27 of 34

where design detail is an evolving thing. The development of a design detail as a project proceeds was a concept that was acknowledged to be appropriate by Dr Grynberg witness for the Responsible Authority and by Mr Quentin Cooke of the EPA.

121 The lack of design detail was of particular concern to the objectors most specifically with respect to the combustor. This matter has been dealt with earlier in our determination. Suffice to say here the issue of the capacity of the combustor to deal with the degassing of the sphere will not arise for another 10 years when some other approach to dealing with the remnant butadiene in the sphere may well be favoured and available.

122 We are of the view that there will be sufficient regulation and examination of the details of all aspects of the works prior to the commencement of the use of the tank and that no use of the tank will be permissible prior to the upgrading of Terminals' licence and safety case.

123 The Responsible Authority argued that the best practice that should be implemented, in the absence of any Australian experience with respect to butadiene storage or a specific butadiene protocol was international best practice and that such best practice was contained in the US Butadiene Product Stewardship Guidance Manual (US Stewardship Manual). The aspects of the proposal that were considered to be inconsistent with the stewardship manual of concern to the Responsible Authority were:

- Back up electricity and gas supply;
- Fixed hoses for ship unloading;
- Lack of a vapour return to the ship;
- Venting of safety relief valves to the atmosphere;

Back up Electricity and Gas

124 The works approval requires 20 minutes back-up power to be available should there be a power failure. It was Terminals' submission that they already had two hour back-up power available on site and were equipped with diesel motors for the fire hydrant pumps. It was put to us that the only need for power at the time of power failure is to provide for the necessary alarms together with details of the state of progress of ship unloading or tank filling activity should this be occurring at the time. The necessary action then would be, given that the pumps will stop of their own accord, to turn off a number of valves. There is in particular no need for concern with respect to the refrigeration system given that the gas will be piped from the ship at zero degrees centigrade and the tank design is such that it would take several days at 40° temperatures and no reconnection of supply for failure to occur.

125 A similar argument to the above can be put with respect to the back-up gas. The only need for gas is in the combustor and the only use for the combustor routinely is for the degassing of the supply line from the ship

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VCAT Reference No. P3601/2004 and P1354/2005 Page 28 of 34

once the tank is filled. The process of degassing can simply be stopped until such time as gas supply is restored.

Fixed Flexible Hoses.

126 It was put to us by the Responsible Authority and objectors that fixed hoses were a preferable means of transferring material from the ship. Terminals response was that both fixed and flexible hoses are susceptible to leaks but that flexible hoses had an advantage for the present proposal in that they can be packed up and stored out of the elements when not in use. It was argued that stored flexible hoses would have a lower failure rate than fixed hoses that remained out in the elements for all of the year. In addition there is a cost advantage in using the flexible hose. The Tribunal accepts this as being a reasonable argument.

Vapour Return

127 The concern about absence of a vapour return line related to the potential incapacity of a ship to be able to hot gas purge the line subsequent to delivering the load together with some concern that the tank could be filled above its design capacity and that this would engender a risk of gas release to the atmosphere. It was Terminals' argument that the use of vapour return was not warranted due to the small number of deliveries per year and the ability of the sphere to contain the expected gas pressures at the flow rates intended. In addition a vapour return line would require the purging of two gas lines post the filling of the sphere with a resultant increase in the length of time the combustor was in use and an increase in the emissions of both Butadiene and Carbon Dioxide.

128 Terminals' experience with VCM delivery and storage is that there is a problem with ships ability to degas the lines in one in every 30 shipments. Further Terminals have a compressor on the site to handle this situation. The Tribunal finds in such circumstances that a requirement for a vapour return line is an unreasonable one that will not offer any particular benefit.

Safety Relief Valve

129 There was a misunderstanding on the part the Council and the objectors with respect to the use of safety relief valves. It was argued on the basis of the information in the Stewardship manual that these valves should be vented to a flare or flares. The safety relief valves are designed to release only when a major incident occurs that is when the pressure in the vessel reaches a value approaching the design pressure. As already discussed the design pressure of the vessel is sufficient to hold the Butadiene in the tank for a total of 45 days should the refrigeration unit fail and the air temperature remain above 40° for all of this time. The Tribunal in these circumstances can see no possible argument for placing flares on the safety relief valve which could restrict flow at a time of emergency and require additional maintenance. We note in this regard that the overall design

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VCAT Reference No. P3601/2004 and P1354/2005 Page 29 of 34

contains three features which could be in part or totally described as meeting the best practice policy contained in the SEPP with respect to the avoidance of waste, namely:

- i the use of an insulated refrigerated tank
- ii with a design pressure of 350 KPAG together with
- iii pressure relief valves which are vented should the pressure increase above a certain level through the combustor.

130 It seems to the Tribunal that the Stewardship Manual touted as best practice by the Council, required the use of flares as the only treatment of emissions from storage vessels that are neither refrigerated nor of the design pressure intended here (Tribunal emphasis).

MONITORING

- 131 The other matter of concern that has relevance to the SEPP related to monitoring. Terminals indicated in a letter of 21 April the nature of the monitoring program they intended to engage in involved taking samples at four locations on five separate occasions. The locations to be chosen among Geelong Grammar School, Corio Health Centre, Corio Primary School, North Shore Primary School, Corio Village Community Centre depending on weather conditions and the like and further, a worst case monitoring during the time that the combustor was in operation on five separate occasions at one location upwind from the combustor and at two locations downwind. The locations to be determined by modelling the dispersion of emissions from the combustor using the forecast temperature and wind speed and wind direction on the day immediately prior to the anticipated sampling dates.
- 132 The objectors had concerns about the method being used to sample butadiene and to what the background emissions would be in the worst case scenario. It was pointed out by them that the intervention level contained within the SEPP was for an hourly monitoring result and that the 24-hour canister method of sampling did not allow for this.
- 133 The Tribunal has amended the monitoring condition on the permit in a number of ways to accommodate these concerns by:
- i substituting the local primary school for the Corio Primary School to give a better spread of sites;
 - ii providing for the background monitoring to occur on at least the first occasion on which the combustor is in operation;
 - iii for the worst case monitoring to be conducted until such time as on-going monitoring conditions are included in the amended licence; and
 - iv for the monitoring methodology - a requirement that samples will be collected in accordance with EPA protocol and a requirement that the results of the sampling program be made available to the Terminals

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VCAT Reference No. P3601/2004 and P1354/2005 Page 30 of 34

Geelong Community Consultative Meeting at the next meeting post the sampling having occurred.

The Tribunal finds that with the condition as modified, the monitoring program proposed is satisfactory.

- 134 The objectors also requested the monitoring be carried out by an independent agency. It is our view that the body that is responsible for the environmental health of Victoria, the EPA, is the appropriate watchdog. We have no reason to doubt the competence or capability of the EPA to appropriately oversee Terminal's monitoring program.

OTHER DESIGN ISSUES

- 135 The objectors had a number of concerns with respect to the design of the system over and above those raised by the Responsible Authority. It was Mr Cicero's concern that pressures would build up in the vessel at the time of unloading and in particular that the fill safety level of the sphere would be exceeded.
- 136 The Tribunal accepts the company's assurance that there will be sufficient controls on the system to ensure excess pressures do not build up within the sphere during the unloading process by way of halting the process or relieving the pressure through the combustor. It however is not expected that such measures would be necessary given the slow rate of pumping proposed and the required zero degree delivery temperature coupled with the refrigeration unit which although not capable of pulling down the

temperature of the Butadiene immediately, will pull it down over a period of time and is capable of holding the temperature at between 0⁰ and 10⁰C.

- 137 The objectors also had concerns with respect to the location of the butadiene supply line on the wharf alongside other delivery pipelines. The Tribunal was informed that it was not intended that more than one ship would be unloading at any one time thereby significantly removing any risk of interaction between pipelines which in any event should be sealed and self contained and notes that for the great majority of the time the butadiene supply line will be empty.
- 138 Concerns were also expressed with respect to the shared use of the tank loading bay for VCM and Butadiene. The Tribunal has no concerns in this regard given that specialised fittings will be provided for each of these chemicals that will ensure that no cross-connections can occur.
- 139 We were provided with information regarding the polymerisation of butadiene in pipelines, the so-called development of *'popcorn'* in sections of the pipe where a build up occurs and ultimately failure of the pipeline that can result. In this regard the Butadiene will arrive at the wharf containing an inhibitor which is intended to prevent any possibility of break-down occurring and there will be quality control measures in place to ensure the level of inhibitor is appropriate at time of arrival. Further, all pipelines will be emptied post delivery and that the likelihood of material

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VCAT Reference No. P3601/2004 and P1354/2005 Page 31 of 34

being held in these pipes and reactions occurring will be significantly less than the potential for such things occurring in the Qenos manufacturing plant where the pipelines are in use most of the time.

PRECAUTIONARY PRINCIPLE

- 140 It was argued by the Council and the objectors that there was insufficient certainty associated with the proposal and that the uncertainty was such that a refusal should be issued in line with the *'precautionary principle'*. We support the philosophy behind the precautionary principle and its application in situations where there is a level of scientific uncertainty with respect to a proposal. We find there is no such uncertainty in the present circumstances. We do not believe there will be any serious irreversible damage to the environment as a result of the location of this facility. The risk assessment that has been carried out for this development has been scientifically based and accepted as such by the expert witnesses called by the Responsible Authority. We find in these circumstances that the application of the principle provides no reason to refuse the proposal. A number of authorities of the application of the principle were provided by both Mr Southall QC and Mr Gobbo QC. We consider our assessment is consistent with each and every one of them.

GREENHOUSE GASES

- 141 The emission of greenhouse gases also comes under the provisions of the SEPP (AQM). The policy at Clause 33 requires management of greenhouse emissions in accordance with policy and best practice. Greenhouse gas emissions will occur as a result of the proposal by way of the use of electricity, in particular from the operation of the refrigeration unit and from the combustor. We have no reason to find that these emissions will not be consistent with best practice. Mr Quentin Cooke described them as the equivalent of thirty family-size domestic households.

OTHER SEPPS

- 142 A number of other State Environment Protection policies are relevant to the proposal. These include the following:
- SEPP Waters of Victoria;
 - SEPP Groundwaters of Victoria;
 - SEPP Noise from Commerce, Industry and Trade;
- 143 There will be three waste water streams from the proposed development namely stormwater, waste water from testing the sphere side deluge system and the waste fire fighting water from response to an accident. All these will be dealt with in the works approval or at the licensing stage of the development.
- 144 The area under the tank itself will be bunded to ensure that any failure of the tank will contain the butadiene within the bund and not contaminate soil

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VCAT Reference No. P3601/2004 and P1354/2005 Page 32 of 34

or water. The bund will be designed to ensure maximum localisation of the Butadiene.

- 145 The proposal does not involve any routine discharges to land. It was acknowledged that the groundwater under the site was already contaminated with a variety of chemicals as a result of the operations of the adjacent Shell Refinery and that there was some risk during construction activities that these might spread the contamination deeper or wider. It was Mr Quentin Cooke's assessment that this risk was manageable and would be handled through a management plan for the construction activity. A separate environment implementation plan is required to address this construction phase of the project.
- 146 The contaminated plume which contains free hydrocarbons was a matter of concern for the objectors. The important issue in our view is there should be no further contamination of the groundwater as a result of the present proposal or any activity on site that adds to the existing contaminated plume.
- 147 Noise is addressed by way of works approval reporting condition which requires the project to require with SEPP N-1.

EMERGENCY RESPONSE

- 148 The objectors were concerned about the lack of an available emergency response plan for the facility. The Terminals site is a major hazard facility under the provisions of the Victorian WorkCover Authority; as such it is required to have a safety case that addresses the prevention and management of major incidents. The operator is also required under the Victorian Workcover Authority to prepare and maintain an emergency response plan. This plan is required to be available at the local library and should be communicated to local residents. It was agreed as part of the work approval conditions that the emergency response plan should include details of an annual communication to residents within the broader North Geelong, Corio area.

ENVIRONMENT EFFECTS STATEMENTS

- 149 It was put to the Tribunal that we should require an environmental effects statement for this proposal. It is open to any of the parties to ask the relevant Minister to require such a statement and we were provided with evidence that the Council had actually done so by a letter dated 27 July 2005 and that no reply had been received to their request.
- 150 We received no information during the course of the hearing that convinced us that an environmental effects statement was an appropriate requirement for this particular facility. The proposal provides no threat to the environment

and in meeting the requirements of the SEPP, will be consistent with policy.

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VCAT Reference No. P3601/2004 and P1354/2005 Page 33 of 34

OTHER GUIDELINES

151 The EPA has a number of buffer guidelines contained within a publication No. AQ2/86 which was revised in July 1990 entitled *Recommended Buffer Distances for Industrial Residual Air Emissions*. This document would require a buffer distance of 1,000m for a facility of the type that is proposed here. The value is the same as that which has found its way into the provisions of Clause 52.10 of the Planning Scheme. It is also a buffer separation that is available in the present circumstance. We find that the detailed assessment of the risks and emissions associated with this facility provide a much better guide to impact on adjoining residential properties.

GEOLOGY

152 The geological instability of the site was raised by Mr Col Edwards and others who provided documentation of a fault system running through the subject site. It was further claimed that the subject site was on reclaimed land and potentially unstable. It was argued that this represented a considerable hazard that could lead to the failure of the tank.

153 Our response in this regard is that the construction of this tank will require full engineering investigation and design details which include the appropriate soil tests; construction will have to take account of the conditions on site and be constructed accordingly. If it should prove that the site is unsuitable for the placing of tank of this size then the project will not be able to go ahead. Considerations of this type however are outside of the scope of our jurisdiction, falling within building permits, not planning or works approval.

CONCLUSIONS

154 It is our conclusion on the basis of the above discussion that a planning permit should issue with conditions and that approval should be granted to the works approval as modified. The proposed development is consistent with planning policy and its location on the site is strongly encouraged. The Tribunal finds that there will be no adverse impact on local health or well-being as a result of the proposal. We are further of the view that it is consistent with *Environment Protection Act* and that, if constructed in accordance with the works approval, will not result in emissions that will have a negative impact on any member of the community or be inconsistent with State Environment Protection Policy (AQM) established for the area.

Tonia Komesaroff Sylvia Mainwaring
Presiding Member Member

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VCAT Reference No. P3601/2004 and P1354/2005 Page 34 of 34