

7 December 2018

G0092:RPH

29327 LFG RA 52 Golf Rd, Oakleigh Sth-Rev01

Joe Khougaz

Golf Road Project Development

C/o VIMG

Level 27/367 Collins Street

Melbourne VIC 3000

Dear Joe,

Review of Desktop Landfill Gas Investigation for 52 Golf Road, Oakleigh South, Victoria

Prensa Pty Ltd (Prensa) was engaged by Golf Road Project Development Pty Ltd (Golf Road Project Development) on behalf of VIC Investments Management Group Pty Ltd (VIMG) to review the *Desktop Landfill Gas Investigation* previously completed by Prensa for the property located at 52 Golf Road, Oakleigh South (the Site). The review was requested to support a development plan application for the Site.

1 Background

Golf Road Project Development plans to lodge a development plan application for the Site with the City of Monash comprising residential development. Schedule 5 of the Development Plan Overlay (DPO5) for the site requires a risk assessment detailing the risk of landfill gas migration from nearby landfills.

Prensa has previously undertaken a landfill gas investigation of the Site for the Department of Treasury and Finance (DTF), the former property owner (reference: *Desktop Landfill Gas Investigation, 1 Beryl Avenue, Oakleigh South, Victoria*, March 2014). It is noted that 1-17 Beryl Avenue was the former address and the Site is now identified as 52 Golf Road.

DTF was contacted by Prensa on 29 November 2018 and consent was provided by DTF on 4 December 2018 for use of the *Desktop Landfill Gas Investigation* by the current owner, Golf Road Project Development. The report was prepared to specifically address the landfill gas risk at the proposed development site and forms the basis of this review, which has also given consideration to contemporary guidance.

2 Objective

The objective of this review was to assess whether the landfill gas investigation previously completed by Prensa for the Site is still relevant for assessing landfill gas migration that may pose a potential human health risk to future occupants and users of the Site with regards to its proposed residential development.

3 Legislative Framework

In completing this review, Prensa gave consideration to the following regulatory framework:

- *Environmental Protection Act 1970*;
- State Environment Protection Policy (SEPP), *Prevention and Management of Contamination of Land*, 2002;
- EPA Victoria, Publication 1323.2, *Landfill Licensing Guidelines*, August 2011 (EPA1323.2); and
- EPA Victoria, Publication 788.3, *Siting, design, operation and rehabilitation of landfills*, August 2015 (EPA788.3).

4 Landfill Gas Risk Assessment

The *Desktop Landfill Gas Investigation* previously completed by Prensa in 2014 has been attached to this document. The following sections provide a review of its currency based on contemporary guidance.

4.1 Technical Framework

It is noted that DPO5 requires a landfill gas risk assessment in accordance with the EPA Publication 788.1, *Siting, design, operation and rehabilitation of landfills*, August 2010 (EPA788.1). It is noted that the EPA788.1 identified in DPO5 has been revised twice with the latest version being EPA Publication 788.3 dated August 2015 (EPA788.3). The updates to the document have not significantly altered the manner in which landfill gas assessment is undertaken compared to that set out in EPA788.1. However, the more recent version has been used as the basis for this assessment.

EPA788.3 provides guidance relating to the technical requirements for siting, design, operation, management and monitoring of landfills in Victoria. Landfill operators and owners are expected to meet the objectives and required outcomes by implementing the relevant best practice measures described by the EPA788.3 as 'suggested measures'. Further, EPA may require additional measures to be undertaken to protect the environment.

The following elements of the EPA788.3 are considered to be relevant to the assessment of landfill gas risk at the Site:

- EPA788.3 specifies buffer distances to buildings and structures for Type 3 (solid inert waste) and Type 2 (putrescible waste) landfills as 200 m and 500 m, respectively;
- EPA788.3 identifies the following landfill gas action levels (hereafter referred to as EPA788.3 trigger levels):
 - 1% v/v methane and 1.5% v/v carbon dioxide above background concentration within the subsurface geology and subsurface services at the landfill boundary;
 - 10,000 ppm of methane within the subsurface services on the landfill and within adjacent areas;

- 5,000 ppm of methane within buildings and structures on the landfill and in adjacent areas and 1% v/v methane within buildings.
- The recommended method to evaluate the level of risk posed by landfill gas from an individual site is to conduct a site-specific landfill gas risk assessment (LGRA). Guidance on how to complete a LGRA is provided in the *Landfill Licensing Guidelines* (EPA Publication 1323.2, August 2011); and
- Appendix 2 of the *Landfill Licensing Guidelines* sets out the basic landfill gas risk assessment process as follows:
 - Development of a conceptual model of the landfill and its surroundings;
 - Hazard identification and risk screening; and
 - Basic quantitative risk assessment.

These steps have been used to review the previous *Desktop Landfill Gas Investigation* undertaken by Prensa in 2014.

4.2 Summary of Desktop Landfill Gas Investigation

The objective of the *Desktop Landfill Gas Investigation* previously completed by Prensa was to, 'provide an indication of the potential for landfill gas to be present at the Site, which may represent a potential risk to the proposed future residential use of the Site.' Prensa considers that this objective is still relevant to the current proposed residential development of the Site.

As part of the *Desktop Landfill Gas Investigation*, Prensa undertook the following:

- Desktop review, including:
 - Review of environmental assessment reports relating to the Site;
 - Liaising with EPA Victoria and the City of Monash;
- Site inspection and monitoring using a portable landfill gas monitor; and
- Preparation of a report outlining the findings.

The desktop review identified a former sand quarry, alternatively identified as 'the Cavanagh Sands Quarry' or the 'Centre Road Quarry', which was located on the corner of Centre and Warrigal Roads, approximately 200 m southwest of the Site.

In summary, the *Desktop Landfill Gas Investigation* identified that the Cavanagh Sands Quarry was:

- Used as a sand quarry;
- Backfilled with "clean fill" according to City of Monash and "solid fill" – "inert" according to EPA Victoria, following its closure. Filling appeared to have begun in the 1980s and was completely backfilled by 1991;
- Rezoned from an Industrial 1 Zone (IN1Z) to a Business 3 Zone (B3Z), in accordance with the City of Monash planning scheme;
- Redeveloped into a "Large Format Home Improvement Store and Supermarket" circa 2012, in accordance with the rezoning information provided by City of Monash. The 'Construction Environmental Management Plan', prepared by Pellicano Builders (2011) for the redevelopment did not incorporate landfill gas collection or vapour mitigation systems, thereby indicating a low potential for LFG generation or migration.

A conceptual site model was developed for the Site, including identification of source (potential landfill at the former Cavanagh Sands Quarry), pathway (migration of methane through soil above groundwater), and receptor (contractors and future residents).

Preliminary landfill gas monitoring was undertaken by Prensa using a hand held landfill gas meter at the former Oakleigh South Primary School in January 2014. The monitoring reported non-detectable concentrations of methane at the nine (9) locations sampled, which predominantly comprised stormwater drains, service pits and a groundwater monitoring well at the Site.

Based on the site history review and landfill gas monitoring undertaken, Prensa considered it unlikely that the Cavanagh Sands Quarry had been filled with putrescible wastes and considered the potential was low for landfill gas to be present at the Site that would pose a potential health risk to future low-density residential users of the Site.

4.3 Assessment of Previous Investigation

Due to the time since the Prensa investigation in 2014, a review and update of desktop resources was completed. This included a review of publicly available information from EPA Victoria:

- A search of EPA Victoria audit reports indicated that an environmental audit had not been undertaken at the former Cavanagh Sands Quarry nor within the vicinity of the former Cavanagh Sands Quarry since the 2014 review.
- Prensa reviewed the interactive Victorian Landfills Register Map (<https://nationalmap.gov.au>) on 5 December 2018. The map identified one (1) solid inert landfill located at 19 - 71 Carroll Road, Oakleigh South, approximately 800 m south-southeast of the Site. A search of the EPA interaction portal indicated that a Post Closure Pollution Abatement Notice (PC PAN) had been issued to this site on 6 September 2016.
- Prensa reviewed the Priority Sites Register on 5 December 2018 (dated 31 October 2018). The landfill located at Carroll Road was noted to be on the Priority Sites Register as a former landfill requiring ongoing management. No other sites were listed in the vicinity of the Site.

A figure indicating the locations of the subsurface service monitoring was not provided in the Prensa 2014 investigation. Prensa submitted a 'Dial Before You Dig' (DBYD) application on 5 December 2018 for the area between the former quarry and the Site. A sewer main was identified to be running in a northwest-southeast direction in between the landfill and the Site. Although no further information was collected (e.g. depth to invert, construction details, age, etc.), it is considered likely that this infrastructure would provide a preferential pathway for landfill gas migration. A copy of the DBYD documentation issued by Melbourne Water has been attached to this document.

Prensa considers that the conceptual site model developed for the Site in the 2014 investigation is still relevant.

Prensa undertook landfill gas monitoring from subsurface services and an onsite groundwater well in 2014. No figure was provided indicating monitoring locations. However, the locations were described within the report text and are considered appropriate, providing coverage around boundaries of the Site and within the Site itself.

In reviewing the source, pathway and receptor risk factors of the conceptual site model, the following aspects mitigate the potential for unacceptable risk:

4.3.1 Source

- The potential source of the landfill gas is approximately 30 years old. As waste degrades over time, its ability to produce methane diminishes. Whilst the time will vary based on many factors, the key period of landfill gas production is generally within 30 years of waste placement. As such the likelihood of sites producing significant quantities of landfill gas that may migrate to the development site is diminished and likely to be low;
- Information suggests the landfill was backfilled with either clean fill or solid inert fill, both of which have a low potential for methane gas generation; and
- Redevelopment of the landfill circa 2012 did not incorporate landfill gas collection or vapour mitigation systems, thereby indicating a low potential for landfill gas generation or migration having been identified by the developer at that time.

4.3.2 Pathway

- The distance to the Site from the Cavanagh Sands Quarry is approximately 200 m, which is the buffer distance recommended for solid inert landfills;
- The geology at the Site has been identified as Quaternary aged high level alluvium, which is conducive to gas migration through the silty sand. The porous nature of the geology provides opportunity for vertical migration of the landfill gas rather than lateral migration (towards the Site);
- Underground services have the potential to create a preferential pathway from the former Cavanagh Sands Quarry towards or away from the Site. A sewer main identified to run between the former quarry and the Site would likely provide a preferential pathway for landfill gas migration (away from the Site);
- Groundwater monitoring previously completed at the Site (reference: Prensa, *Environmental Site Assessment*, August 2013) indicated that groundwater was shallow, with gauging data identifying groundwater between approximately 2.2 to 3.3 m below ground level. This limits the ability for landfill gas to migrate laterally in the subsurface soils; and
- Landfill gas monitoring undertaken by Prensa in 2014 from subsurface services and groundwater monitoring wells did not indicate the presence of landfill gas.

4.3.3 Receptor

- The proposed future development comprises residential townhouses with no proposed basement levels.

4.4 Summary

Based on the conceptual model and the review of the key risk factors presented above, Prensa considers that the risk of landfill gas migration occurring and causing an unacceptable human health or environmental impact on the proposed residential development at 52 Golf Road, Oakleigh South, is low. As such, further landfill gas investigation or assessment is not considered warranted. This conclusion is supported by:

- The type (clean fill or solid inert) and significant age (approximately 30 years) of the placed waste;
- The distance to the receptor;
- The current development overlying the former quarry;
- The presence of a sewer main between the former quarry and the Site;
- The shallow depth of groundwater; and
- The direct monitoring at the site providing no evidence of landfill gas migration to the site.

These lines of evidence suggest that there is unlikely to be a pathway for landfill gas migration towards the Site.

5 Closing

Should you have any questions or queries regarding the report, please do not hesitate to contact me on (03) 9508 0100.

Yours sincerely,

A handwritten signature in black ink, appearing to read "Rachael Hofmann".

Rachael Hofmann
Senior Environmental Consultant
Prensa Pty Ltd

Attachments

- Statement of Limitations.
- DBYD documentation from Melbourne Water
- Prensa, *Desktop Landfill Gas Investigation*, March 2014

Statement of Limitations

This document has been prepared in response to specific instructions from Golf Road Project Development to whom the report has been addressed. The work has been undertaken with the usual care and thoroughness of the consulting profession. The work is based on generally accepted standards, practices of the time the work was undertaken. No other warranty, expressed or implied, is made as to the professional advice included in this report.

The report has been prepared for the use by Golf Road Project Development and the use of this report by other parties may lead to misinterpretation of the issues contained in this report. To avoid misuse of this report, Prensa advise that the report should only be relied upon by Golf Road Project Development and those parties expressly referred to in the introduction of the report. The report should not be separated or reproduced in part and Prensa should be retained to assist other professionals who may be affected by the issues addressed in this report to ensure the report is not misused in any way.

Prensa is not a professional quantity surveyor (QS) organisation. Any areas, volumes, tonnages or any other quantities noted in this report are indicative estimates only. The services of a professional QS organisation should be engaged if quantities are to be relied upon.

Sampling Risks

Prensa acknowledges that any scientifically designed sampling program cannot guarantee all sub-surface contamination will be detected. Sampling programs are designed based on known or suspected site conditions and the extent and nature of the sampling and analytical programs will be designed to achieve a level of confidence in the detection of known or suspected subsurface contamination. The sampling and analytical programs adopted will be those that maximises the probability of identifying contaminants. Golf Road Project Development must therefore accept a level of risk associated with the possible failure to detect certain sub-surface contamination where the sampling and analytical program misses such contamination. Prensa will detail the nature and extent of the sampling and analytical program used in the investigation in the investigation report provided.

Environmental site assessments identify actual subsurface conditions only at those points where samples are taken and when they are taken. Soil contamination can be expected to be non-homogeneous across the stratified soils where present on site, and the concentrations of contaminants may vary significantly within areas where contamination has occurred. In addition, the migration of contaminants through groundwater and soils may follow preferential pathways, such as areas of higher permeability, which may not be intersected by sampling events. Subsurface conditions including contaminant concentrations can also change over time. For this reason, the results should be regarded as representative only.

Golf Road Project Development recognises that sampling of subsurface conditions may result in some cross contamination. All care will be taken and the industry standards used to minimise the risk of such cross contamination occurring, however, Golf Road Project Development recognises this risk and waives any claims against Prensa and agrees to defend, indemnify and hold Prensa harmless from any claims or liability for injury or loss which may arise as a result of alleged cross contamination caused by sampling.

Reliance on Information Provided by Others

Prensa notes that where information has been provided by other parties in order for the works to be undertaken, Prensa cannot guarantee the accuracy or completeness of this information. Golf Road Project Development therefore waives any claim against the company and agrees to indemnify Prensa for any loss, claim or liability arising from inaccuracies or omissions in information provided to Prensa by third parties. No indications were found during our investigations that information contained in this report, as provided to Prensa, is false.

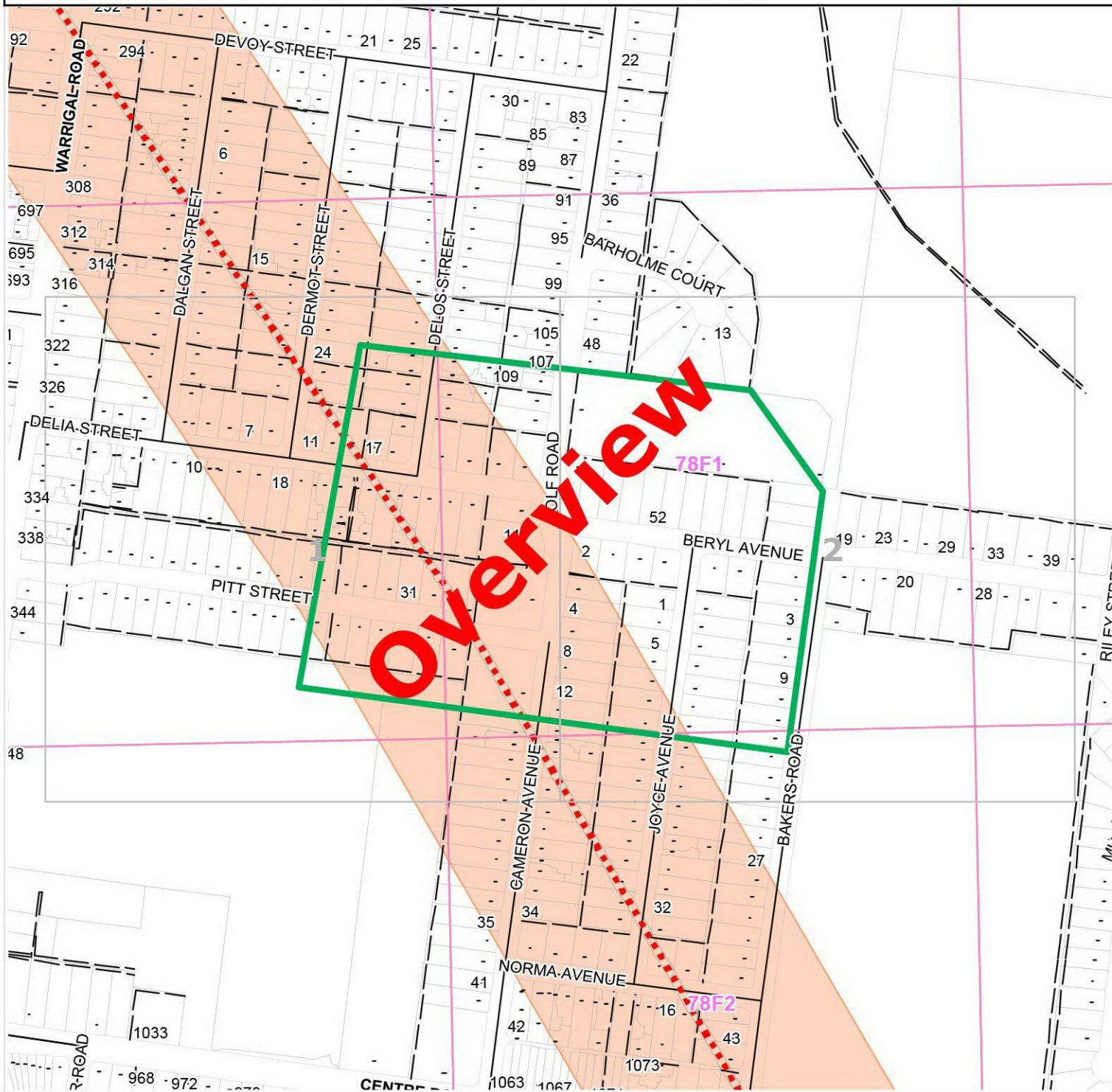
Recommendations for Further Study

The industry recognised methods used in undertaking the works may dictate a staged approach to specific investigations. The findings therefore of this report may represent preliminary findings in accordance with these industry recognised methodologies. In accordance with these methodologies, recommendations contained in this report may include a need for further investigation or analytical analysis. The decision to accept these recommendations and incur additional costs in doing so will be at the sole discretion of Golf Road Project Development and Prensa recognises that that Golf Road Project Development will consider their specific needs and the business risks involved. Prensa does not accept any liability for losses incurred as a result of Golf Road Project Development not accepting the recommendations made within this report.

Sewer Assets Plan

DBYD Sequence Number: 78266761

DBYD Job No. 15416187

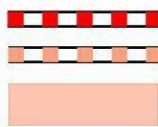


Address: 52 Golf Road, Oakleigh South, VIC, 3167

Map Ref: Melways 78E1, 78F1, 78F2

Date Supplied: 05/12/2018

1:2000



Sewer main

Abandoned sewer main

Sewer buffer

Please contact the Melbourne Water Asset Services team on 9679 6614 if proposed works are to be undertaken within the shaded area



Area of interest



Easement



Property boundary



House number unknown

345F4

VicRoads map reference

27D4

Melway map reference

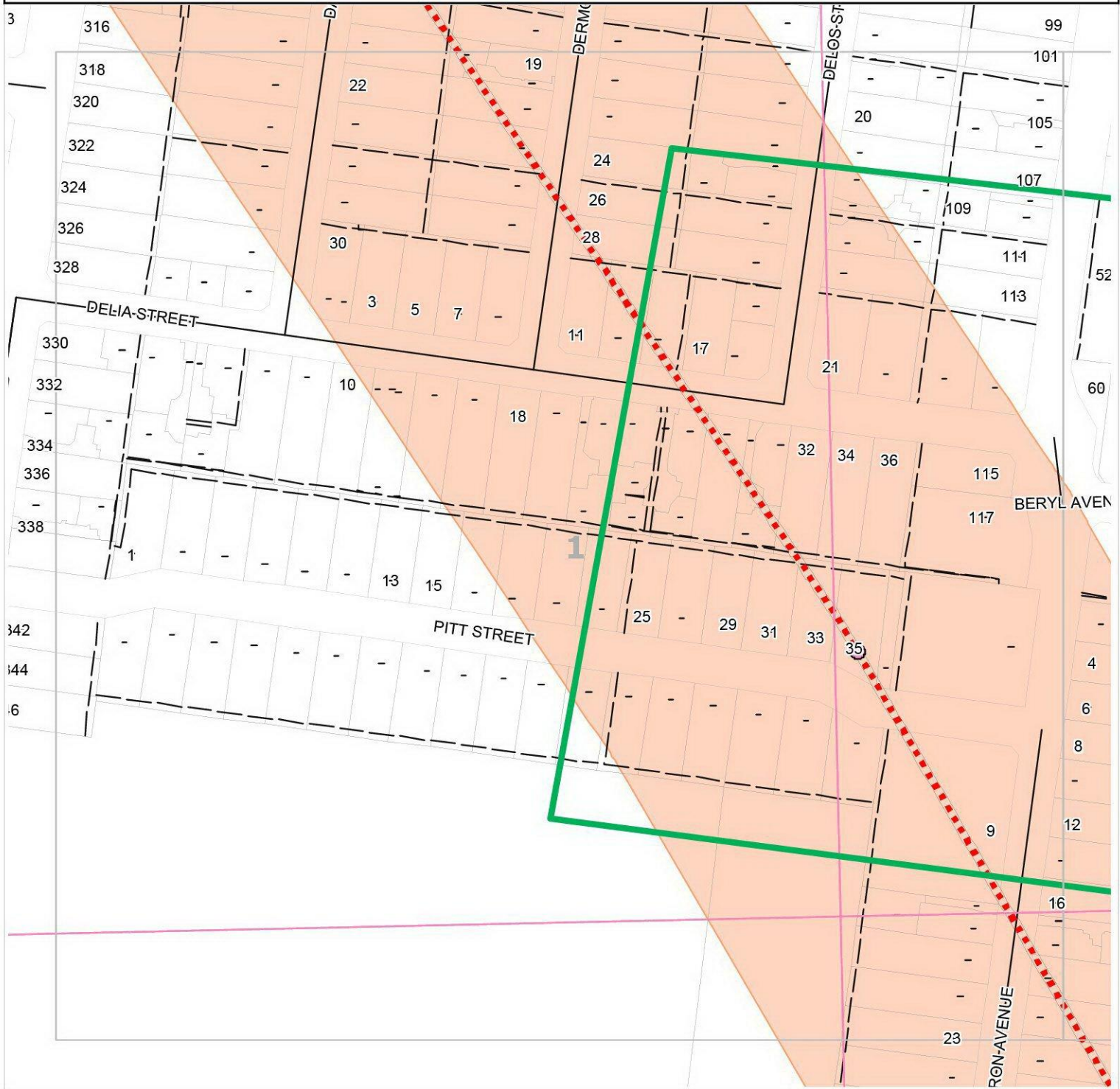


Assets may contain asbestos material and therefore works on these assets must be undertaken in accordance with OHS (asbestos) Regulations.

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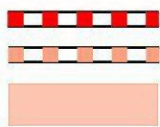


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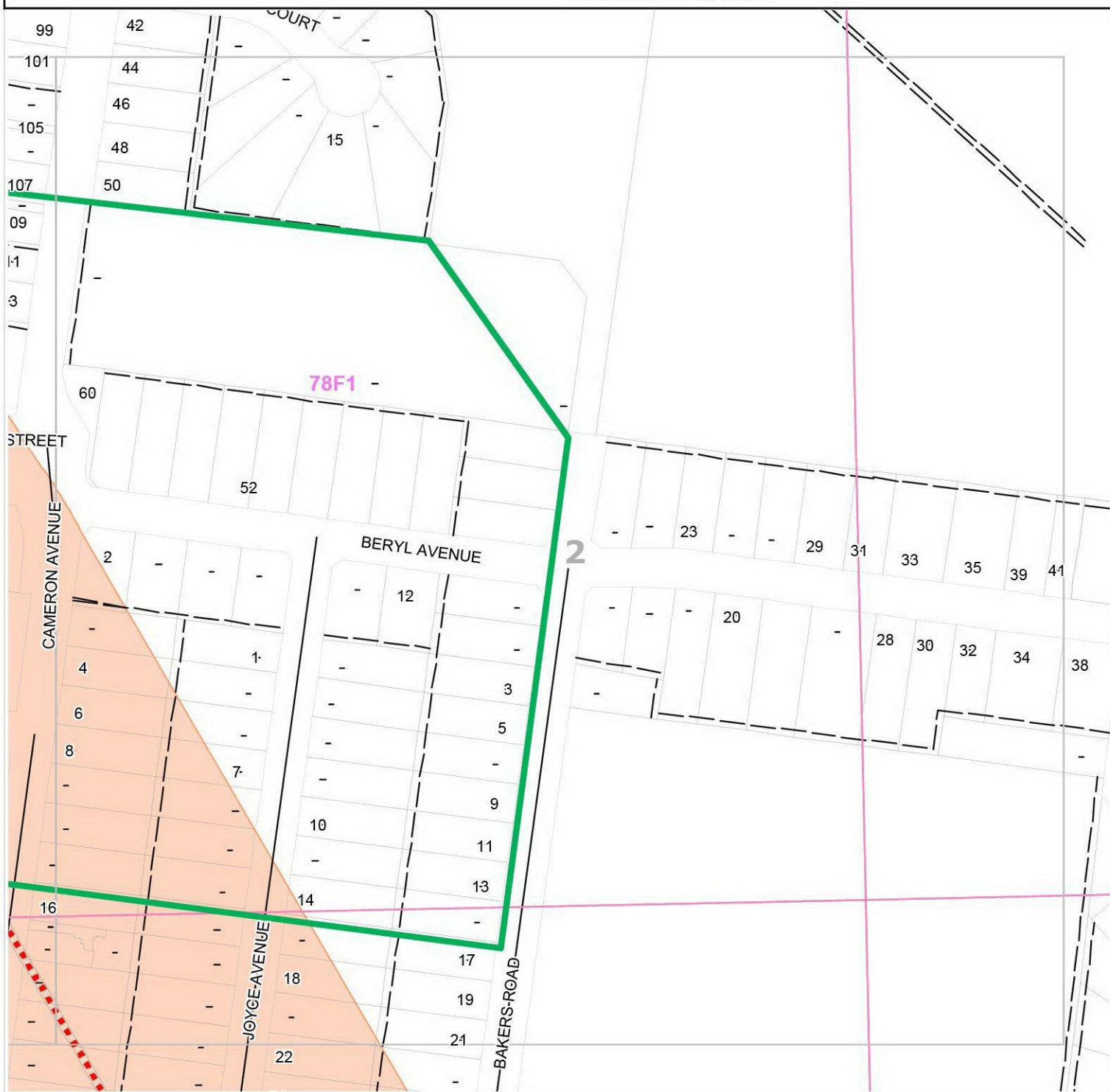


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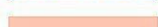
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Assets may contain asbestos material and therefore works on these assets must be undertaken in accordance with OHS (asbestos) Regulations.

Desktop Landfill Gas Investigation

1 Beryl Avenue

Oakleigh South, Victoria

Department of Treasury and Finance

March 2014



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Job No: 13991: Client No: D0003

Executive Summary

Prensa was engaged by the Department of Treasury and Finance (DTF) to undertake a desktop landfill gas (LFG) investigation at former Oakleigh South Primary School, located at 1 Beryl Avenue, Oakleigh South (the Site).

DTF intends to divest the Site and has applied to have the Site rezoned from Public Use-Education to residential as part of the divestment process. A letter was issued by EPA Victoria (EPAV) relating to the proposed residential rezoning of the Site and its close proximity to the former Cavanagh Sands, sand quarry. The letter noted that the *"Schedule to the Development Plan Overlay (DPO) requires a site assessment to be undertaken on these sites to confirm they are suitable for sensitive uses, prior to the redevelopment for such uses."*

DTF requested a desktop investigation that would assess the potential for landfill gas (LFG) to exist at the Site, based on the proposed residential development and in light of the comments provided within the EPAV letter.

The objective of the desktop landfill gas investigation was to provide an indication of the potential for landfill gas to be present at the Site, which may represent a potential risk to the proposed future residential use of the Site.

Multiple investigations have previously been undertaken at the Site, predominantly relating to the presence of two former underground storage tanks (USTs) on site. Following the removal of the USTs, residual hydrocarbon impacted soil was found to remain on site. The soil was excavated and bio-remediated, prior to being disposed off-site. Groundwater monitoring undertaken at the Site reported non detectable concentrations of hydrocarbons, and minor concentrations of metals, which were considered to be indicative of background concentrations. The most recent assessment undertaken at the Site by Prensa, concluded that it was *"considered unlikely that a statutory environmental audit would be required due to the soil management program successfully implemented at the Site."* Based on the review of the environmental assessments undertaken at the Site, it is considered that the potential for contamination to be present at the Site which would represent a health risk to future low density residential users of the Site is low.

A desktop review of the Cavanagh Sands quarry found minimal publicly available information regarding its potential former use as a landfill. A review of historical aerial photographs indicated that a sand quarry was located at the Cavanagh Sands property, potentially from as early as 1931. Information provided by EPAV indicated that the property has been completely backfilled with inert material since 1990. The City of Monash reported that the Cavanagh Sands property was operational from 1940 and was filled using clean fill. The property has recently been redeveloped into a homemaker centre, circa 2012.

Limited landfill gas monitoring was undertaken by Prensa using a hand held landfill gas meter at the former Oakleigh South Primary School in January 2014. The monitoring reported non-detectable concentrations of methane at the nine (9) locations sampled, which predominantly comprised stormwater drains, service pits and groundwater monitoring well at the Site.

In summary, the desktop landfill gas investigation identified that Cavanagh Sands was:

- Used as a sand quarry;
- Backfilled with “*clean fill*” according to City of Monash and “*solid fill*” – “*inert*” according to EPAV, following its closure;
- Rezoned from an Industrial 1 Zone (IN1Z) to a Business 3 Zone (B3Z), in accordance with the City of Monash planning scheme;
- Redeveloped into a “*Large Format Home Improvement Store and Supermarket*” circa 2012, in accordance with the rezoning information provided by City of Monash. The ‘Construction Environmental Management Plan’, prepared by Pellicano Builders (2011) for the redevelopment did not incorporate landfill gas collection or vapour mitigation systems, thereby indicating a low potential for LFG generation or migration.

Based on the site history review and limited landfill gas monitoring undertaken it is considered unlikely that Cavanagh Sands was filled with putrescible wastes and the potential for landfill gas to be present at the Site, which would pose a potential health risk to future low density residential users of the Site is low.

Statement of Limitations

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Department of Treasury and Finance recognises that sampling of subsurface conditions may result in some cross contamination. All care will be taken and the industry standards used to minimise the risk of such cross contamination occurring, however, Department of Treasury and Finance recognises this risk and waives any claims against Prensa and agrees to defend, indemnify and hold Prensa harmless from any claims or liability for injury or loss which may arise as a result of alleged cross contamination caused by sampling.

Reliance on Information Provided by Others

Prensa notes that where information has been provided by other parties in order for the works to be undertaken, Prensa cannot guarantee the accuracy or completeness of this information. Department of Treasury and Finance therefore waives any claim against the company and agrees to indemnify Prensa for any loss, claim or liability arising from inaccuracies or omissions in information provided to Prensa by third parties. No indications were found during our investigations that information contained in this report, as provided to Prensa, is false.

Recommendations for Further Study

The industry recognised methods used in undertaking the works may dictate a staged approach to specific investigations. The findings therefore of this report may represent preliminary findings in accordance with these industry recognised methodologies. In accordance with these methodologies, recommendations contained in this report may include a need for further investigation or analytical analysis. The decision to accept these recommendations and incur additional costs in doing so will be at the sole discretion of Department of Treasury and Finance and Prensa recognises that that Department of Treasury and Finance will consider their specific needs and the business risks involved. Prensa does not accept any liability for losses incurred as a result of Department of Treasury and Finance not accepting the recommendations made within this report.

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1 Introduction

Prensa was engaged by Department of Treasury and Finance (DTF) to undertake a desktop landfill gas (LFG) investigation at former Oakleigh South Primary School, located at 1 Beryl Avenue, Oakleigh South, Victoria (the Site).

2 Background

It was understood that DTF proposes to divest the Site, and as part of the divestment process has applied for the Site to be rezoned from Public Use Zone-Education to residential. EPA Victoria (EPAV) prepared a letter '*DEECD Surplus Land Rezoning Project*' addressed to the Department of Transport, Planning and Local Infrastructure, dated 22 November 2013 (EPAV ref: 5003719), in relation to the proposed re-zoning. The letter related to the proposed rezoning of three former primary schools and their close proximity to "*Former sand quarries [that] have been historically used for land-filling, which has often included the filling of putrescible wastes*". Specifically in regards to the Site, the letter stated that "*Oakleigh South Primary School is located approximately 150 metres from the 'Cavanagh Sands' site*".

Furthermore, the letter noted that the "*Schedule to the Development Plan Overlay (DPO) requires a site assessment to be undertaken on these sites to confirm they are suitable for sensitive uses, prior to the development for such uses*".

DTF requested a desktop LFG investigation be undertaken to assess the potential for landfill gas to exist at the Site, based on the proposed residential redevelopment of the Site and in light of the comments provided within the EPAV letter.

3 Objectives

The objective of the desktop landfill gas assessment is to provide an indication of the potential for landfill gas to be present at the Site, which may represent a potential risk to the proposed future residential use of the Site.

4 Scope of Works

As part of the Landfill Gas Investigation, Prensa undertook the following:

- Review of environmental assessment reports relating to the Site;
- LFG Desktop review, including liaising with EPAV and the City of Monash;
- Site inspection and monitoring using a portable landfill gas monitor; and
- Preparation of this report outlining the findings.

In completing the above tasks, Prensa undertook works in general accordance with the following:

- Environment Protection Act, 1970;
- State Environment Protection Policy (SEPP), *Prevention and Management of Contamination of Land*, 2002;
- National Environment Protection (Assessment of Site Contamination) Measure (NEPM) No.1 Amendment, 2013;
- Victorian EPA Publication 788.1: *Best Practice Environmental Management – Siting, Design, Operation and Rehabilitation of Landfills*, 2010;

- Australian Standard 4482.1, Guide to Investigation and Sampling of Sites with Potentially Contaminated Soil, Part 1: Non-volatile and Semi-volatile compounds, 2005;
- Australian Standard 4482.2, Guide to the Sampling and Investigation of Potentially Contaminated Soil, Part 2: Volatile Substances, 1999;
- Victorian EPA Publication 1416: *Draft Landfill Gas Fugitive Emissions Monitoring Guidelines*, 2011; and
- EPA Publication 1270: *Assessment of the Potential for Methane Gas Movement from Victorian Landfills*, 2009.

5 Findings

5.1 Site History Findings

5.1.1 Report Reviews

As part of the history review for former Oakleigh South Primary School, Prensa reviewed the following documents, in light of the LFG investigation:

- Beveridge Williams, *Contamination Assessment Oakleigh South Primary School Beryl Avenue, Oakleigh South*, February 2000. The scope of this assessment included a limited site history review and the establishment of four (4) boreholes. The report made no reference to the potential for landfill gas to be present at the Site.
- Beveridge Williams, *Validation Sampling and Testing, Oakleigh South Primary School Beryl Avenue, Oakleigh South*, June 2002. The scope of the assessment included validation sampling following the removal of two (2) underground storage tanks at the Site. The report did not make a reference to the potential for landfill gas to be present at the Site.
- Beveridge Williams, *Contamination Assessment Oakleigh South Primary School Beryl Avenue, Oakleigh South*, May 2003. The report included a limited site history review and the establishment of twenty (20) boreholes at the Site. No reference was made within the report to the potential for landfill gas to be present at the Site.
- Golder Associates Pty Ltd, *Preliminary Contamination Assessment & Cost Estimate – DET Site, Oakleigh South*, 11 November 2005. The assessment reviewed the three (3) Beveridge Williams reports and provided a cost estimate to undertake further work at the Site. No reference was made within the report to the potential for landfill gas to be present at the Site.
- HLA Envirosciences Pty Ltd (HLA), *Environmental Site Assessment Former Oakleigh South Primary School, Beryl Avenue, Oakleigh South*, 1 December 2006. The assessment included the establishment of seventeen (17) test pits. No reference was made within the report to the potential for landfill gas to be present at the Site.
- HLA, *Groundwater Assessment Former Oakleigh Primary School, Beryl Avenue, Oakleigh South*, 19 January 2007. The assessment included the installation of three (3) groundwater wells at the Site and a groundwater monitoring event (GME). No reference was made within the report to the potential for landfill gas to be present at the Site.
- HLA, *Additional Environmental Site Assessment Former Oakleigh South Primary School, Beryl Street, Oakleigh, Victoria*, 9 January 2008. The scope of the assessment included a site history review, establishment of two (2) test pits and a GME. The report referred to the presence of a disturbed area of land south west of the Site, which was present in the 1951 and 1963 aerial

photographs, which may have been referring to the Cavanagh Sands quarry. No reference was made within the report to the potential for landfill gas to be present at the Site.

- Prensa, *Phase 1 Preliminary Environmental Site Assessment – Former Oakleigh South Primary School, Oakleigh South VIC 3167*, August 2010. The scope of the assessment included a site history review. The report referred to the presence of a quarry of landfill-type feature in the 1950 and 1960 aerial photograph. No further reference was made in the reports to the quarry/landfill feature. Re-inspection of these photographs by Prensa indicated the potential presence of a sand quarry in 1931 on the Cavanagh Sands property, although specific details were difficult to discern based on the resolution of the 1931 photograph. The quarry was clearly visible in the 1950 photograph, and appeared to have expanded to the east, south east from the 1931 aerial photograph. The quarry/landfill feature did not appear to be as deep in the 1984 aerial photograph, and appeared to have been completely backfilled by 1991. The Cavanagh Sands property was converted into a homemaker centre and supermarket, sometime between 2010 and 2012.
- Senversa, *Review of Various Environmental Site Assessment Reports Former Oakleigh South Primary School, 1 Beryl Avenue, Oakleigh South VIC 3167*, 22 February 2012. The scope of the assessment included a review of the previous environmental assessment reports relating to the Site, with no reference made to the potential for landfill gas to be present at the Site.
- Prensa, *Environmental Site Assessment, 1 Beryl Avenue, Oakleigh South, Victoria, Revision 1*, August 2013. The scope of the review included a review of previous report, excavation of residual contamination from the former USTs, validation sampling, installation of three (3) groundwater monitoring wells and a GME.
- Prensa, *Site Development Management Plan, 1 Beryl Avenue, Oakleigh South, Victoria*, August 2013. The management plan was developed following the identification of asbestos containing material (ACM) debris with a soil stockpile on site. No reference was made within the management plan for the potential for landfill gas to be present at the Site.

5.1.2 Online Review

A general online review was unable to source any information regarding the 'Cavanagh Sands' property in relation to its former use.

5.1.3 EPA Victoria

Prensa contacted EPAV to obtain information regarding the Cavanagh Sands property and also reviewed several publicly available EPAV documents. The information obtained from EPAV included the following:

- EPAV provided Prensa with an untitled map from the South Eastern Regional Waste Management Group of old landfills located within the Heatherton/Dingley area. The map indicated that the Cavanagh Sands property was located on the north eastern corner of Warrigal Road and Centre Road and that the landfill was reportedly filled with "inert waste".
- An untitled excel document provided by EPAV to Prensa indicated that the landfill closed before 1990. The geology at the property was listed as being unconsolidated sedimentary deposits, predominantly comprised of sand. A groundwater well had reportedly been removed from the property.

- A search of EPAV audit reports indicated that an environmental audit had not been undertaken at the Cavanagh Sands property nor within the vicinity of the Cavanagh Sands property.
- Prensa reviewed EPA Publication 1270 '*Assessment of the potential for methane gas movement from Victorian Landfills*' 2009, which assessed all licensed and formerly licensed landfills recorded in the EPA's database (a total of 260 landfills) for the potential for methane gas migration. It was noted that the Cavanagh Sands property was not listed as a landfill assessed within this publication.
- A publicly available map on the EPA website titled '*Clayton area current and closed Landfills and Composters*' indicates the location of former and current landfills within the Clayton South, Clarinda and Dingley areas. The map did not indicate that a landfill was formerly located at the Cavanagh Sands property.
- Prensa reviewed the Priority Sites Register (dated 31/01/2014) during February 2014. The Cavanagh Sands was not noted to be on the Priority Sites Register. There were noted to be two (2) Priority Sites within a 5 km radius of the subject Site, however, these were not related to landfilling activities.

5.1.4 City of Monash

The City of Monash was contacted to obtain council documentation relating to the Cavanagh Sands property. The City of Monash indicated the following:

- Written information obtained from April Williams, Waste Services Project Officer of the City of Monash, reported that the Cavanagh Sands quarry was operational from 1940 and was filled using clean fill.
- Publicly available council planning documents titled, '*1041-1049 Centre Road and 348-350 Warrigal Road, Oakleigh South-Large Format Home Improvement Store and Supermarket*' and '*Amendment C87 to the Monash Planning Scheme -1041-1049 Centre Road and 346-350 Warrigal Road, Oakleigh South*' dated April 2009 were reviewed. The documents referred to the proposal for the homemaker centre and required rezoning of the property. Within the planning documents the Cavanagh Sands property was referred to as the 'Centre Road Quarry.'
- A 'Construction Environmental Management Plan' (CEMP) for 1041 Centre Road, Oakleigh South, prepared by Pellicano Builders Pty Ltd, dated 17th December 2007, provided by the City of Monash was reviewed. The CEMP made no reference to the Cavanagh Sands property being a former quarry or the potential for the property to have been formerly used as a landfill.

5.2 Geology

Prensa reviewed the Geological Map Series Melbourne Map Sheet 1:63,360, No. 849, Zone 7, Ringwood. The map identified Quaternary aged high level alluvium. The Site was also surrounded by Quaternary-aged sand ridges and sand hills.

5.3 Hydrogeology

5.5.1 Surface Water Receptors

The closest surface water receptors to the Site were:

- Various lakes within Huntingdale and Metropolitan Golf Course, located approximately 400 m north, 1.1 km north east and 1.2 km north east;
- A lake located within the Commonwealth Golf Club, located approximately 500 m south east;
- Moorabbin Reservoir, located approximately 600 m west;
- Karkarook Lake, located approximately 2.3 km south; and
- Port Phillip Bay, located approximately 8.5 km south of the Site.

5.5.2 Groundwater Database search

A search of the *Visualising Victoria's Groundwater* online database identified nine (9) registered groundwater wells within a 600 m radius of the Site. A summary of the review of the groundwater bores has been summarised in Table 1 below.

Table 1: Summary of Nearby Groundwater Bores

Bore ID	Location	Well Depth (m)	Use	Lithology screened
81766	260 m south west	144.7	Fire fighting/ sports/general	Sand and clay
WRK042476	280 m south east	144.70	Irrigation	Sand and clay
WRK042470	480 m north east	91.50	Irrigation	Sand and clay
116281	490 m south west	122.00	Irrigation	Sand
WRK055378	550 m north west	6.00	Observation	Clayey sands
142964	560 m north west	8.00	Investigation	Sand and silty sand
WRK058371	560 m north west	6.00	Observation	N/A
WRK058372	580 m north west	6.00	Observation	N/A
WRK055379	580 m north east	6.00	Observation	N/A

No standing water level data existed for the groundwater wells.

5.4 Landfill Gas Monitoring

The former quarry to the south west of the Site (currently a Woolworths and Masters Home Improvement Centre) was reportedly converted into a landfill following the quarry closure circa mid-1900's. Closed landfills can continue to produce methane gas for many years following closure, which can potentially migrate offsite through the local geology following a path of least resistance into buildings and houses nearby.

Sarah Fitzpatrick and Holly Butler of Prensa, attended the former Oakleigh South Primary School site on Thursday the 16th of January 2014 to conduct a landfill gas assessment. A hand held GFM410 landfill gas monitor was used to statistically measure oxygen, carbon dioxide and methane. Of particular interest was the presence of methane gas, which is a known by-product of landfill decomposition, particularly where putrescible waste has been deposited.

Gas measurements were taken to assess for the presence of landfill related gases at the Site. A total of nine (9) measurements were taken at, and adjacent to, the Site, as outlined in Table 2 below. The landfill gas monitor did not register a concentration of methane at the monitored locations.

Table 2: Landfill Gas Monitoring Results

Location	Methane (%)	Carbon Dioxide (%)	Oxygen (%)
Stormwater drain, Barkers Road boundary	0	0	20.8
Stormwater drain, south eastern portion of the Site	0	4	17.3
Stormwater drain, Golf Road boundary	0	0.1	20.7
Concrete stormwater pit, centre of the Site	0	0	20.9
Stormwater pit, south western corner on Beryl Avenue	0	0	21.1
Stormwater pit on northern boundary	0	0	21.1
Telstra pit, northern boundary	0	0	21
Stormwater pit, on Golf Road, near the north western corner of the Site	0	0	21.1
Monitoring Well 8, located south eastern portion of the Site	0	14.7	9.3

6 Conceptual Site Model

6.1 Site Specific Geology

The geology at the Site has been identified as Quaternary aged high level alluvium, which is consistent with field observations of silty sand.

6.2 Potential Sources of Landfill Gas Contamination

A potential off site source of landfill gas contamination is the former Cavanagh Sands property located at 1041-1049 Centre Road and 346-350 Warrigal Road, approximately 200 m south west of the Site at its closest point, which may have been used (albeit unlikely) a landfill.

6.3 Contaminants of Potential Concern

The potential contaminant of concern is methane, a known by product of landfill decomposition, particularly where putrescible waste has been disposed.

6.4 Transport Mechanisms and Exposure Pathways

Methane can migrate through the soil profile, at varying depths above the ground water table. Methane can migrate offsite following a path of least resistance through the geology into buildings and houses nearby. The main potential exposure pathway for occupants of the Site is vapour inhalation of methane gas.

6.5 Potential Receptors

The on-site human receptors would include the following:

- Contractors during the development of the Site; and
- Users of the proposed future low density residential development.

7 Significance of Results

Minimal historical information was available regarding the operation of a landfill at the former Cavanagh Sands property, with information generally suggesting the quarry was backfilled with inert material. Aerial photographs indicated that a sand quarry may have operated at the Cavanagh Sands property as early as 1931. The Cavanagh Sands property was reported to have been filled with clean fill and has not been operational for twenty four (24) years, according to information provided by EPAV and City of Monash. It was noted that the property has recently been developed into a homemaker centre, circa 2012.

Additionally, limited landfill gas monitoring undertaken at former Oakleigh South Primary School did not report concentrations of methane at the nine (9) locations sampled.

EPA Publication 788.1 *'Siting, Design, Operation and Rehabilitation of Landfills,'* 2009, prescribes buffer distances to manage landfill gas impacts from closed landfills. The buffer distance are measured from the sensitive land use to the edge of the closest cell, or in the absence of knowledge of the cell location, the premise boundary is used as the point of measurement. Publication 788.1 indicates that a 200 m buffer distance should be maintained from buildings or structures for a minimum of 30 years post-closure, for landfills filled with solid inert waste. It is noted that at its closest point, the Site is located approximately 200 m from the Cavanagh Sands property.

Based on the site history information obtained, the limited landfill gas monitoring undertaken and the distance from the Site to the Cavanagh Sand property, it is considered that the potential for landfill gas to be present at the Site, which would pose a potential health risk to future low density residential users of the Site is low.

8 Conclusion

Multiple investigations have been undertaken at the Site, predominantly relating to the presence of two (2) former USTs on site. Following the removal of the USTs residual hydrocarbon impacted soil was found to remain on site, in addition to odorous soil. The soil was excavated and bio-remediated, prior to being disposed of off-site. Additionally, groundwater monitoring undertaken at the Site, did not report concentrations of hydrocarbons, with only minor metal concentrations, considered to be indicative of background concentrations, reported. The most recent assessment undertaken at the Site concluded that it was *"considered unlikely that a statutory environmental audit would be required due to the soil management program successfully implemented at the Site."* Based on the review of the environmental assessments undertaken at the Site, it is considered that the potential for contamination to be present at the Site which would represent a health risk to future low density residential users of the Site is low.

A desktop review of the Cavanagh Sands quarry found that minimal information was publicly available regarding the use of the property as a landfill. Information provided by EPAV and the City of Monash indicated that the property has been completely backfilled with inert material since 1990. The property has recently been redeveloped in a homemaker centre, circa 2012.

Limited landfill gas monitoring was undertaken by Prensa using a hand held landfill gas meter at the former Oakleigh South Primary School in January 2014. The monitoring reported non-detectable concentrations of methane at the nine (9) locations sampled, which predominantly comprised stormwater drains, service pits and groundwater monitoring well at the Site.

In summary, the desktop landfill gas investigation identified that Cavanagh Sands was:

- Used as a sand quarry;
- Backfilled with “*clean fill*” according to City of Monash and “*solid fill*” – “*inert*” according to EPAV, following its closure;
- Rezoned from an Industrial 1 Zone (IN1Z) to a Business 3 Zone (B3Z), in accordance with the City of Monash planning scheme;
- Redeveloped into a “*Large Format Home Improvement Store and Supermarket*” circa 2012, in accordance with the rezoning information provided by City of Monash. The ‘Construction Environmental Management Plan’, prepared by Pellicano Builders (2011) for the redevelopment did not incorporate landfill gas collection or vapour mitigation systems, thereby indicating a low potential for LFG generation or migration.

Based on the site history review and limited landfill gas monitoring undertaken it is considered unlikely that Cavanagh Sands was filled with putrescible wastes and the potential for landfill gas to be present at the Site, which would pose a potential health risk to future low density residential users of the Site is low.

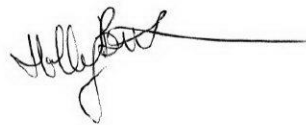
9 Application of this Report

The report should not be separated or reproduced in part and should be read in its entirety.

Prensa Pty Ltd



Sally Bonham
Principal Environmental Consultant



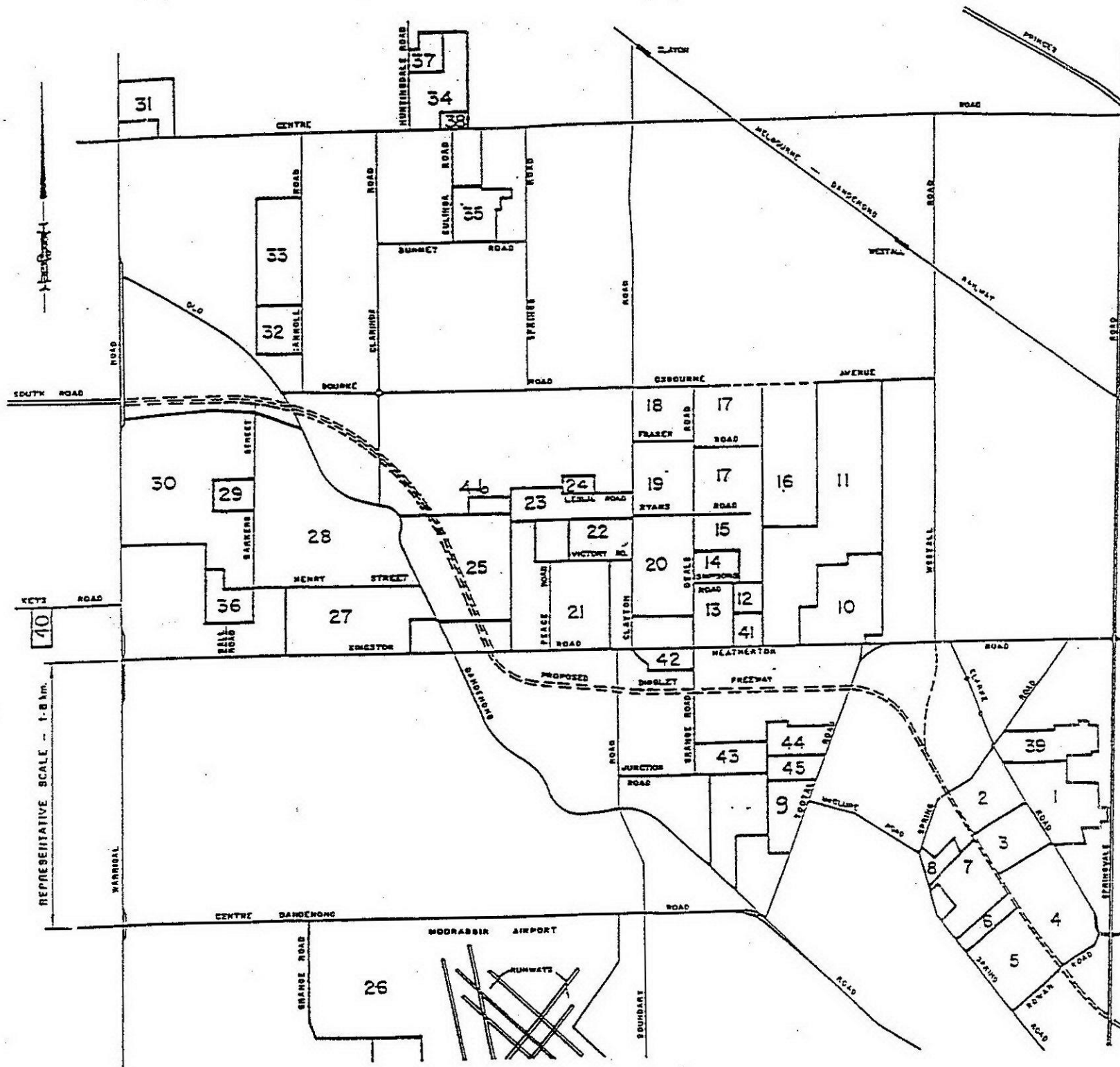
Holly Butler
Senior Environmental Consultant

Appendix A: EPA Documents

SOUTH EASTERN REGIONAL WASTE MANAGEMENT GROUP

HEATHERTON - DINGLEY AREA

REFUSE DISPOSAL SITES

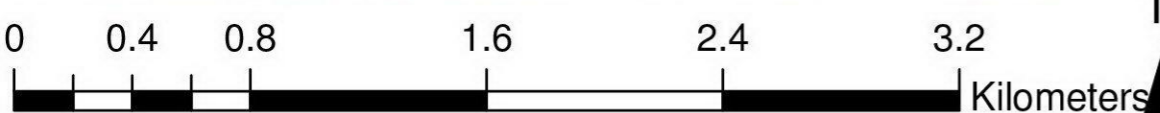
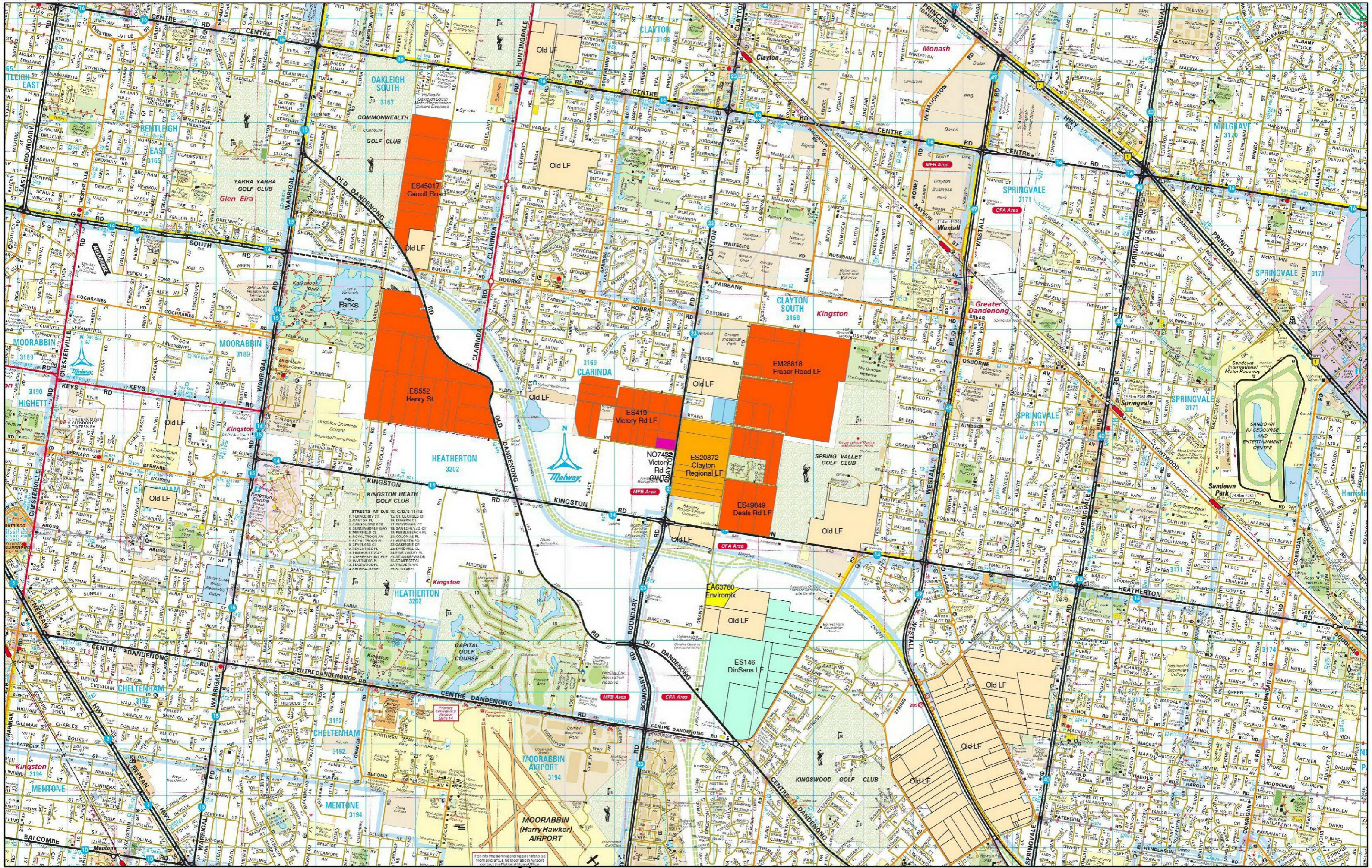


NO.	OWNER	E	PT	F
1.	CITY OF GREATER DANDENONG (SPRING VALLEY PARK)	P		
2.	CSR/PBM	P		
3.	CSR/PBM			●
4.	MINISTER FOR PLANNING & ENVIRONMENT (EX CITY OF WAYERLEY)			●
5.	EX (CITY OF SPRINGVALE)			●
6.	EX (CITY OF WAYERLEY)			●
7.	EX (CITY OF MORDIALLOC)			●
8.	A.V. DEVELOPMENTS- VIDOTTA SITE (EX CITY OF MALVERN)			●
9.	ERNEST SMITH CONTRACTORS (DIN SAN NURSERY, ETC.)	I		
10.	EX (CITY OF OAKLEIGH)			●
11.	SPRING VALLEY GOLF CLUB			
12.	EX (CITY OF PRAHRAN)			●
13.	AMATEK LTD.		●	
14.	EX (CITY OF OAKLEIGH)			R
15.	CLEANAWAY	I		
16.	PIONEER	P		
17.	PIONEER			○
18.	BAYVIEW QUARRIES	I		
19.	BRAMBLES INDUSTRIES/CLEANAWAY			●
20.	CITY OF BOROONDARA & OTHERS	P		
21.	PIONEER CONCRETE P/L - PIONEER QUARRIES LTD.			●
22.	SIMS SAND SUPPLIES P/L	I		
23.	CITY OF KINGSTON			●

NO.	OWNER	E	PT	F
24.	ALLIED SAND P/L (SOLID FILL)	I		
25.	PIONEER CONCRETE P/L			●
26.	COMMONWEALTH OF AUSTRALIA			A
27.	PIONEER CONCRETE P/L			●
28.	HEATHERTON SAND SUPPLIES	I		
29.	CITY OF MOORABBIN			R
30.	MELBOURNE WATER			
31.	CAVANAGH SAND SUPPLY P/L (SOLID FILL)	I		
32.	CITY OF KINGSTON			●
33.	PIONEER			●
34.	CONSOLIDATED QUARRIES			●
35.	CITY OF OAKLEIGH EX			●
36.	CITY OF BRIGHTON EX			●
37.	CITY OF OAKLEIGH EX			●
38.	CITY OF OAKLEIGH EX			●
39.	CITY OF SPRINGVALE EX			●
40.	CITY OF MOORABBIN EX			●
41.	PROLL & EMERSON			●
42.	VIDOTTA			●
43.	VIDOTTA			●
44.	ERNEST SMITH CONTRACTORS			●
45.	ERNEST SMITH CONTRACTORS			●
46.	WHELAN KARTAWAY	I		

LEGEND

- Existing
- Potential
- Filled
- Filled Open Space
- Putrescible P
- Inert I
- PT
- F
- R



Clayton Area current and closed Landfills and Composters

Appendix B: Council Documents

Holly Butler

To: Sarah Fitzpatrick
Subject: RE: Information regarding landfill gas sites

From: Sarah Fitzpatrick [mailto:sarah.fitzpatrick@prensa.com.au]
Sent: Wednesday, 29 January 2014 10:49 AM
To: Butler
Subject: FW: Information regarding landfill gas sites

Sarah Fitzpatrick | HSE Consultant | Prensa Pty Ltd
Office: 261-271 Wattletree Rd, Malvern VIC 3144
Postal Address: PO Box 2203, Wattletree Rd LPO, East Malvern VIC 3145
Phone: (03) 9508 0100 **Mobile:** 0401 637 344
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From: April Williams [mailto:AprilW@monash.vic.gov.au]
Sent: Thursday, 23 January 2014 11:58 AM
To: 'Sarah Fitzpatrick'
Subject: RE: Information regarding landfill gas sites

Hi Sarah,

I have forwarded your questions to the relevant manager and this is his response:

I refer to your request regarding information on Talbot Road and 1041-1049 Centre Road. The Council operated landfill at Talbot Road was filled between 1977 -78 with putrescible waste. This was a small landfill with monitoring undertaken which showed no migration of gas at the boundaries. This was undertaken some 5 years ago. The Centre Road/Warrigal site was operational from 1940 and was filled using clean fill.

In regards to your request for the development proposal for the sites, I have requested this information from our Town Planning department. Some of these files are stored off-site, but when these are retrieved, I will be able to provide you with information from the files.

Thanks,



April Williams
Waste Services Project Officer

Email: AprilW@monash.vic.gov.au

Phone: (03) 9518 3774

Fax: (03) 9518 3444

National Relay Service: 1800 555 660

380 Ferntree Gully Road, Notting Hill, VIC 3168

www.monash.vic.gov.au

From: Sarah Fitzpatrick [<mailto:sarah.fitzpatrick@prensa.com.au>]

Sent: Thursday, 16 January 2014 9:28 AM

To: April Williams

Subject: Information regarding landfill gas sites

Hi April,

I am conducting a landfill gas assessment on behalf of a client, to determine if there is any risk of landfill gas at their sites located near the two former landfills (outlined below). Information provided by the City of Monash, may be included in the report to our client (which would not be a publicly available document), and will also help to form our decision regarding whether there is a risk.

At present, I have minimal information regarding the former landfill sites, and would like to obtain any information regarding the landfills, but in particular I would like to know how long (including the dates) that the landfills operated for, and the type of waste that the landfills may have been filled with.

One landfill is located at Talbot Park, on Centre Road Oakleigh South. It appears that the Talbot Park area at this Site may have been remediated, while the rest of the former quarry, which is located north and north west of the park, appears to have been backfilled and abandoned.

The other site is located at 1041 – 1049 Centre Road, 346 and 348 – 350 Warrigal Road. It has recently been redeveloped into a shopping centre, including a Masters and Woolworths. I understand that this area was rezoned from industrial to business use prior to the redevelopment. The Site was formerly a sand quarry and may have subsequently been used as a landfill. It may have been referred to as the 'Cavanagh Sands' site.

Any information that the City of Monash has regarding landfills at these sites would be appreciated.

Kind Regards,

Sarah Fitzpatrick | HSE Consultant | Prensa Pty Ltd

Office: 261-271 Wattletree Rd, Malvern VIC 3144

Postal Address: PO Box 2203, Wattletree Rd LPO, East Malvern VIC 3145

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5.1 AMENDMENT C87 TO THE MONASH PLANNING SCHEME –1041 – 1049 CENTRE ROAD & 346 – 350 WARRIGAL ROAD, OAKLEIGH SOUTH

(TP343:AJ:RMK)

Owner:- 1041 Centre Road Pty Ltd

Applicant:- Spade Consultants Pty Ltd

Ward : Oakleigh

Responsible Director: Paul Kearsley

Reason for Council Consideration: Strategic Planning/Amendment to the Monash Planning Scheme

RECOMMENDATION

1. *That the Minister for Planning be requested to authorise Council to prepare Amendment C87 to the Monash Planning Scheme to:*
 - a. *rezone the site at 1041 – 1049 Centre Road and 346 – 350 Warrigal Road, Oakleigh South from an Industrial 1 Zone (IN1Z) to a Business 3 Zone (B3Z); and*
 - b. *modify the existing Design and Development Overlay 1 (DDO1) for the land at 1041 – 1049 Centre Road and 348– 350 Warrigal Road, Oakleigh South to provide a 6 metres landscape buffer adjacent to both the north and east boundary; and*
 - c. *modify the Schedule to the B3Z-Business 3 Zone to allow the following leasable floor areas: -*
 - *a maximum of 20,000 m² for Office*
 - *a minimum of 1,000 m² for Restricted Retail*
 - *a minimum of 500 m² for Lighting shops**at 1041 – 1049 Centre Road and 348– 350 Warrigal Road, Oakleigh South.*
2. *That Amendment C87 be prepared as outlined in this report and, following authorisation by the Minister for Planning, be placed on public exhibition.*
3. *That following the completion of the public exhibition period a report be prepared that details all submissions received and provides further advice to Council in respect of Amendment C87.*

PURPOSE OF THIS REPORT

To consider rezoning of the site at 1041 – 1049 Centre Road and 346 – 350 Warrigal Road, Oakleigh South from IN1Z-Industrial 1 to B3Z-Business 3 to facilitate office type development and uses. [see Attachment 2].

BACKGROUND

The amendment affects two properties. They are: -

- 1041 – 1049 Centre Road and 348 – 350 Warrigal Road, Oakleigh South (the former Centre Road Quarry); and
- 346 Warrigal Road, Oakleigh.

Both properties are currently zoned IN1Z-Industrial 1, and are subject to the DDO1-Design and Development Overlay 1 provisions of the Monash Planning Scheme.

The DDO1 is a built form control which regulates the setback of buildings from the street and residential boundaries, building heights, fencing and landscaping for new development proposals.

1041 – 1049 Centre Road is predominantly vacant land with a new warehouse building located near the Centre Road frontage, approved by planning permits TPA/34730 & TPA/35598 in February and December 2007.

346 Warrigal Road is occupied by an office building, approved by planning permit TPA/33181 issued in July 2005.

PROPOSAL

The application to amend the Monash Planning Scheme proposes the following:

-

- rezone the site at 1041 – 1049 Centre Road and 348 – 350 Warrigal Road, Oakleigh South from IN1Z-Industrial 1 to B3Z-Business 3.
- modify Clause 22.02 to exempt the site from being subject to the provisions of this clause.

Clause 22.02 only applies to land within the Monash Technology Precinct, which is primarily located in Clayton. The Clause assists the development and operation of high technology, office and industrial land uses in the precinct.

- Modify the Schedule to the B3Z-Business 3 Zone to allow development of up to 20,000m² of office and up to 6,000m² of restricted retail on 1041 – 1049 Centre Road and 348 – 350 Warrigal Road, Oakleigh South.

Examination of the detail submitted with the Amendment highlighted the need to modify the amendment to include:-

- rezone the property at 346 Warrigal Road Oakleigh South from IN1Z-Industrial 1 to B3Z-Business 3.
- modify the existing Design and Development Overlay 1 (DDO1) provisions for the property at 1041 – 1049 Centre Road and 348 – 350 Warrigal Road, Oakleigh South, to require a landscape buffer, 6.0 metres wide, adjacent to the northern residential boundary and the eastern boundary abutting Council's reserve.

The purpose of a Business 3 Zone is to encourage the integrated development of offices and manufacturing industries and associated commercial and industrial uses.

The amendment will facilitate the development and use of the former quarry site for offices and recognise the current use of the property at 346 Warrigal Road.

The controls for the development of the sites which will be retained are as follows: -

- Front Setbacks: - Warrigal - 20.0 metres
Centre Road – 20.0 metres
- Building height: - Nominal figure of 7 metres above ground level, however approval can be granted for higher buildings. New development on the former quarry property will be limited in height due to the construction limitations of building on filled land. It is anticipated that buildings will generally be no more than two or three storeys in height.
- Front Fencing: - Located no closer to the street than the nominated front setback figure, subject to conditions
- Engineering Design: - New accessways and streets must be designed using established engineering treatments and fit in with existing streetscape details.
- Services: - Not to be visible from the Street.
- Heights of buildings near residential boundaries: - Half the height of the building plus 1.5 metres. (ie. 5 metres for a 7 metre height building)

The amendment proposed to introduce a 6.0 metre landscape buffer interface requirement to the DDO1 for the property at 1041 – 1049 Centre Road and 348 – 350 Warrigal Road. This setback area is to be landscaped and is not to be used for any building or development, including car parking areas.

This requirement will assist in the management of the amenity issues that usually arise where new office/commercial/industrial uses are proposed to be introduced onto a site which abuts a residential area.

Any specific issue raised by the development of the site such as noise, the location of rubbish areas, loading areas, vehicle access, services, lighting, car parking and security will be managed through the planning permit approvals process at that time.

Similarly, tree retention will be managed through the planning permit process.

These properties are not part of the Monash Technology Precinct and therefore Clause 22.02 should be amended to recognise this exclusion.

In support of the amendment application a Preliminary Concept Plan has been submitted. [see Attachment 3]

The Concept Plan shows vehicle access to both Warrigal and Centre Roads, a number of Office buildings, Restricted Retail (Peripheral Sales) buildings, car parking and landscape areas.

It should be noted that this plan is not submitted for approval but it is only a Concept Plan showing one potential development option. It is provided for discussion purposes and to assist in consideration of the issue relevant to the proposed amendment.

Referring to the table below, this Plan shows a total floor area for all uses of 19,868m², including approximately 15,972m² of office and approximately 3,896m² of restricted retail.

	Office	Restricted Retail	Lighting shop
Concept Plan net floor areas	15,972m ²	3,896m ²	N/A
Applicant's proposed net floor areas to zone schedule	max. 20,000m ²	Max 6,000m ²	N/A
Recommended net floor areas to zone schedule	max. 20,000m ²	min. 1000m ²	min. 500m ²

Notwithstanding the concept plan, the applicant has formally requested the modification of the Schedule to the B3Z-Business 3 Zone to allow development of up to 20,000m² of office.

It is appropriate to nominate a limit on the total office floor area for the property at 1041 – 1049 Centre Road and 348 – 350 Warrigal Road, Oakleigh South to give everyone, the developer and local residents, some level of certainty about the potential development on the site.

A Planning Permit is required for the use if the Schedule office floor area limit is exceeded. A Planning Permit is required for all development.

The Concept Plan, while not detailed to allow comprehensive assessment, has been examined and appears reasonable. Approximately 20,000m² of floor area for the site appears to be appropriate.

Therefore it is considered that a limit of 20,000m² for offices is appropriate for inclusion in the Schedule. This figure would provide the developer the opportunity to develop the site as per the concept plan, or alternatively, exclusively as an office park.

The Schedule also defines minimum floor areas for restricted retail premises and lighting shops to prevent the development of smaller retailing activities in the zone. There is no restriction on maximum floor areas for these uses.

The standard minimums specified in the schedule are 1000m² for restricted retail and 500m² for lighting shops. These figures are also considered to be appropriate for the subject site.

CONSULTATION

The Public Exhibition process involved with the amendment will include: -

- Individual notice to surrounding property owners and occupiers. The extent of the notification proposed is detailed in Attachment 4.
- A public meeting, after normal work hours.
- Display advertisement in the a local newspaper circulating in the area
- Multiple large notices on the sites
- Notification to: -
 - Melbourne Water
 - Vic Roads
 - Minister for Planning
 - Minister for Industry and State Development
 - Minister for Water Environment and Climate Change, and
 - Minister for Energy Industries and Resources
- Notice in the Government Gazette

AMENDMENT PROCESS

The Planning Authority for an application for amendment to the Planning Scheme has the choice to either: -

- refuse to process the application, or
- proceed with the amendment process and place the amendment on public exhibition.

A determination to place an amendment on exhibition does not indicate approval or support for the amendment. The amendment is placed on exhibition, without commitment by Council, as to its final decision.

Council has two (2) further opportunities to determine to abandon or refuse the amendment. I.e. Following exhibition of the amendment or after a Panel hearing, if required.

Further consideration of the merits of the amendment proposal should be undertaken following the exhibition process when a greater understanding of the community's interest and its response to the proposal has been received.

Authorisation is required from the Minister for Planning for the preparation and public exhibition of an amendment to a Planning Scheme.

POLICY CONSIDERATION

Amendment C87 has been assessed against the objectives of the State and Local Planning Policy Framework including the Municipal Strategic Statement and Local Policy.

The Amendment is considered to be complimentary to Clause 12 (Metropolitan Development), Clause 14 (Settlement) and Clause 17 (Economy) of the State Planning Policy Framework.

The Amendment builds on and implements relevant areas of the Local Planning Policy Framework, including Clauses 21.03 (Strategic Framework Plan), 21.05 (Economic Development) and 21.07 (Industry).

More specifically, it is supportive of: -

- Clause 21.03-3 as the proposed DDO1 will ensure appropriate development setbacks and reinforce the Garden City Character of the Municipality
- Clause 21.05-3 as it will facilitate employment opportunities and create an environment which will assist business growth.
- Clause 21.07-3 as it encourages the renewal and development of industrial land.

The Amendment is considered to be consistent with Melbourne 2030, and in particular: -

- Directions 1 – A more compact City.
- Direction 4 – A more prosperous place.
- Direction 5 – A great place to be.

CONCLUSION

It is recommended that Amendment C87 to the Monash Planning Scheme be placed on public exhibition following authorisation by the Minister for Planning.

5.2 1041-1049 CENTRE ROAD & 348-350 WARRIGAL ROAD, OAKLEIGH SOUTH – LARGE FORMAT HOME IMPROVEMENT STORE AND SUPERMARKET

(TP30:MD:HM)

Ward : Oakleigh

Responsible Director: Paul Kearsley

Reason for Council Consideration: Strategic Planning

RECOMMENDATION

That the Minister for Planning and Planning Panels Victoria be advised the following:

1. *That prior to consideration of the proposal by the Panel, the economic analysis provided should be updated to provide an analysis of the impact of the supermarket on surrounding Activity Centres.*
2. *Council considers that the corner of the intersection of Warrigal Road and Centre Road should also be included in the Business 1 zone.*
3. *That Council has no objection to the re-zoning of the subject site to a Business 1 Zone subject to a Design and Development Overlay being included over the land to retain the existing minimum 6 metre landscape setback along the northern boundary to protect the residential amenity of adjoining properties in the event that the current proposal does not proceed.*
4. *Support for the Woolworths Supermarket at the proposed location is based on the closure of the Safeway store on the corner of North Road and Warrigal Road.*
5. *The Council has concerns regarding the proposed development on the site as follows:*
 - *There is concern in respect to the effect the proposal will have on the residential amenity of adjoining residents, in particular the loading areas located along the rear boundary of the residential properties. There are concerns about the noise and vibration generated by loading vehicles reversing and idling, which may not be eliminated by the provision of an acoustic fence.*
 - *Austroads Design Prime Mover & Semi-trailer (19 metres) requires a minimum radius of 15 metres excluding vehicle overhang. There is concern that the truck turning circle of 14 metres will be inadequate and should be increased.*
 - *The location of the two easternmost raised pedestrian crossings do not provide a landing for pedestrians on the car park side of the crossing.*

- *Disabled parking bays outside the supermarket do not appear to provide a footpath for persons with disabilities to safely access the shopping centre.*
- *It is considered that the trolley bays are located too far away from the store entrances, particularly those associated with the home improvement store.*
- *It is suggested that the four car parks located within the landscaped area on the north side of the entrance roadway may create congestion and should be removed.*
- *Signalised intersections are proposed for both access points in Warrigal Road and Centre Road. There is concern that the traffic report suggests that exclusive left turn lane/slip lanes are not necessary on either road in order to be consistent with the existing crossovers adjacent to and opposite the site. This is not considered to be a significant argument against the provision of left turn lanes. The report also argues that these are not feasible to construct due to the narrow nature strip and the presence of fragile services within the nature strip. Similar developments located on Warrigal Road and Centre Road in the vicinity of this proposal (Bunnings at 1126 Centre Road and Safeway at Warrigal Road/North Road) have provided left turn slip lanes at their entrance points.*
- *The traffic report Section 4 identifies that there are existing uses which currently take access from Warrigal Road and Centre Road in the vicinity of the signals. These are proposed to be restricted to left-in/left-out movements on the approach and departure of the signalised intersections by way of modified line marking. There is no assessment of the impact of these proposed turn bans.*
- *The traffic report is considered to overestimate the "multi-trip" and "passing trade" factors in calculation traffic generation figures. A factor of 10% for multi-trip peak hour trip ends and an additional factor of 30% for "passing trade" applied to site generated traffic in peak hours are not substantiated and effectively reduce the calculated traffic impact on the adjacent roads. The RTA Guide to Traffic Generating Developments (2002) suggests a rate of 20% for shopping centres of this size.*
- *As the Centre Road access is proposed to be signalised, further consideration of the design of the intersection between the proposed internal roadway and the warehouse roadway is required.*

6. *It is considered that the following conditions should be included on any permit issued in addition to the draft conditions proposed:*

- (i) *Include in Condition 1: The recommendations as contained in the Acoustic Report prepared by Watson Moss Growcott Acoustics Pty Ltd dated 4 February 2010 must be incorporated into the proposed development and shown on the endorsed plans.*

- (ii) *Include in Condition 1: gates be provided at the south-eastern corner of the Home Improvement Centre to avoid unauthorised access and potential "hoon" behaviour near the residential abuttal.*
- (iii) *All deliveries to the site and collection of waste must only occur between the hours of 6am and 10pm seven days a week.*
- (iv) *Replace Condition 17 with the following: Outdoor lighting must be designed, baffled and located to the satisfaction of the Responsible Authority to prevent any adverse effect on adjoining land.*
- (v) *Insert the following drainage requirements under Condition 11 as follows:*
 - *Stormwater discharge is to be detained on site to the predevelopment level of peak stormwater discharge.*
 - *Direct the entire site's stormwater drainage to the south west corner of the property where it must be collected and free drained via a pipe to the existing pit.*
 - *All on-site stormwater is to be collected from hard surface areas and must not be allowed to flow uncontrolled into adjoining properties. The on-site drainage system must prevent discharge from the driveway onto the footpath. Such a system may include either:*
 - a) *A trench grate (175mm minimum internal width) located within the property; and/or*
 - b) *Shaping the driveway so that water is collected in a grated pit on the property; and/or*
 - c) *Another Council approved equivalent.*
- (vi) *Deletion of any conditions relating to the subdivision of the land.*

BACKGROUND

The subject land is a former quarry site located between Centre Road and Warrigal Road, Oakleigh South. The site is 'L-shaped' with frontage of 171 metres to Warrigal Road and 96 metres to Centre Road. Overall site area is approximately 7.8 hectares. See Attachment 1 for locality plan.

The southern most part of the site, adjacent to Centre Road, is currently occupied by a large warehouse with the balance of the site being generally flat and devoid of any structures or vegetation.

Surrounding development comprises a bus depot, warehouse/office development, fast food and bulky goods stores, local shops and conventional residential development located to the north of the site and along the south side of Centre Road. The Stan Riley Reserve is located to the east of the site.

On 19 March 2009, Amendment C87 was gazetted which rezoned the subject site and the adjoining land through to the intersection, to a Business 3 Zone. A

schedule to the zone limits office floor space to a maximum of 20,000 square metres, restricted retail to a minimum floor area of 1,000 square metres and lighting shop to a minimum floor area of 500 square metres. General retail or 'shop' uses are prohibited under the Business 3 Zone.

The Minister for Planning has been requested by Woolworths to assist in providing a coordinated and timely process for consideration of 12 new large format home improvement and hardware stores across Victoria, including a proposal at the subject site.

The Minister for Planning considers that the proposed new stores are of State significance given their potential to deliver significant economic and employment benefits, as well as greater retail choice to the Victorian community by increasing retail competition in the sector.

An Advisory Committee has been appointed by the Minister for Planning to advise on the suitability of the sites for development, including a strategic review of the appropriateness of any rezoning/proposed use in view of relevant State and Local Planning Policy Frameworks, the appropriate planning controls for any proposed amendments and whether a planning permit should be issued, including suggested permit conditions.

See Attachment 2 for the Terms of Reference for the Advisory Committee.

PROPOSAL

The proposal is for a Section 96A application to rezone and develop the land at the subject site. The proposed redevelopment of the land seeks the construction of a new Woolworths home improvement store and a supermarket with some speciality shops. In addition, the proposed rezoning of the land to a Business 1 Zone is to facilitate the proposed uses.

The plans of the proposal show the following (Attachment 3):

Home Improvement Store

A large home improvement store comprising 13,443 square metres is proposed to be sited within the north eastern portion of the site. The trade section and garden nursery are located on either side of the main retail floor space which is dedicated to bulky goods and trade supplies. The breakdown of the floor area of each use within this component of the development is as follows:

Use	Floor Area sqm
Restricted Retail/Trade Supplies	8042
Trade Section	2276
Nursery	1910
Back of House	874
Office Mezzanine	341
Total Floor Area	13,443

Supermarket and Speciality Shops

The proposed supermarket is proposed to be sited within the north western portion of the site adjacent to Warrigal Road. The supermarket comprises a total floor area of 3,800 square metres.

A total of 10 speciality retail tenancies with a total area 1,100 square metres are proposed to be located around the forecourt area at the entrance to the supermarket.

Access and Car Parking

A total of 629 car parking spaces are proposed within an at-grade car park on the site, which includes specialised parking for disabled persons, families and trailers. A total of 20 double sided bicycle rails are to be situated at the front of the supermarket and home improvement store for customers and a further 20 spaces located at the rear of the development for staff use.

Vehicle access to the site is to be provided by a new signalised access to Warrigal Road, situated in the centre of the site's western boundary. Secondary access is provided via the existing crossover from Centre Road, which will also be signalised.

Loading Facilities

Loading facilities are to be provided at the rear of the proposed buildings, towards the site's northern boundary. A loading dock suitable to accommodate two semi-trailers side by side is to be provided for the Home Improvement/Garden/Trade use. A recessed dock is to be provided at the rear of the proposed supermarket also suitable to accommodate a 17 metre heavy vehicle. A general loading area is to be available for use by the speciality stores with pedestrian access provided to each tenancy from the rear. A further loading area (delineated by line marking) is to be provided at the rear of the Trade building.

The applicant advises that it is expected that commercial vehicles will enter the site via the proposed traffic signals, then utilise the circulation road to access the rear of the store and reverse into the dedicated dock. It is noted that the access road is located adjacent to the residential area.

It is proposed that all deliveries will be restricted to occurring between the hours of 6am and 10pm, seven days a week.

Built Form and Layout

The proposed building is to be setback 6.2 metres from the Warrigal Road frontage. The existing warehouse building fronting Centre Road is to be retained and is setback 20 metres from the Centre Road frontage.

A landscape setback of 6.17 metres has been provided along the northern boundary of the site, adjacent to the existing residential area to the north.

Within this landscape setback an acoustic wall is proposed to be located 5.2 metres from the northern boundary. The acoustic wall has a height of 4.5 metres (opposite the loading area) and 4 metres high (opposite the home improvement centre).

The internal circulation road accessing the loading area is located to the south of the acoustic wall/landscape area with the buildings then setback 13.45 metres from the northern boundary.

A landscape setback of 6 metres is provided along the eastern boundary of the site.

The total wall height of the northern elevation is approximately 7.2 metres. In the central section of the main building the plant equipment is proposed to be located on the roof and has a total height of 11.85 metres.

The Warrigal Road façade is bookmarked at both corners with architectural elements, which feature lightweight translucent panel cladding that can be used for future business identification signage and general branding for the overall development.

The prominent southern façade of the building represents the major active frontage of the development and faces onto the car parking area. The entrances to the building are identified through prominent architectural features (entry canopies) that will also contain the corporate signage for the supermarket and home improvement centre. These canopies have a total height of approximately 11.7 metres measured to the top of the parapet. Generally, the total wall height of the southern façade is approximately 7.8 metres. The entrance to the supermarket and associated speciality shops represents a defined feature of the southern elevation, with a raised wall height of approximately 9.3 metres and the addition of extensive glazing to the façade.

CONSULTATION

The Department of Planning and Community Development has undertaken notification of the proposal to owners and occupiers of land abutting or adjoining the site. Referral authorities have also been notified and a newspaper notice was published in the Moorabbin Glen Eira Leader newspaper on 30 March.

Submissions are required to be received by Planning Panels -Victoria on Tuesday
4 May 2010.

ASSESSMENT

The main matters for discussion are listed below.

Rezoning

Under the current Business 3 Zoning a permit may be granted for the proposed restricted retail premises, trade supplies and gardening supplies, however, the use of the land for a 'shop', including a supermarket, is prohibited.

In order to facilitate the approval of the whole of the development on the subject site, the Minister for Planning proposes to rezone the land to a Business 1 Zone. The purpose of the Business 1 Zone is to encourage the intensive development of business centres for retailing and other complementary commercial, entertainment and community uses.

An Economic Report has been submitted with the application which analyses the economic issues associated with the rezoning of the site from Business 3 to Business 1 in respect to the home improvement component. The report indicates that the new store is likely to draw some business from beyond a 10km radius however the impact will be mitigated by growth in the market. Due to this growth in the market, impacts on competing retailers should not result in the closure of competitive retailers that are adequately serving the market. More importantly, the report indicates that the effect of the development on the established Activity Centre hierarchy will be minimal and will not impact on the role of any centre in the hierarchy.

The economic analysis however, is incomplete as the report does not evaluate the supermarket component of the development nor the proposal that the existing supermarket is to be relocated from the corner of North and Warrigal Road. It is considered that the Department of Planning and Community Development should seek further information prior to the Panel Hearing to ensure all aspects of the proposal have been included in the analysis.

Ultimately the strategic basis for the proposed amendment must also be underpinned by State and Local planning policy frameworks.

In particular it is noted that the site is located at the confluence of three municipalities and accessible by local bus services with public transport links to Principal or Major Activity Centres. The centre has evolved in an ad hoc fashion with bulky goods/convenience restaurants in the Glen Eira side and a collection of shops in the Kingston side. It is considered that the proposed development of the subject site will provide the opportunity to consolidate the role of the centre and result in the precinct being consistent with the defining characteristics of a Neighbourhood Activity Centre, which is consistent with Clause 12 of the Monash Planning Scheme and Melbourne 2030.

Clause 21.06 of the Monash Planning Scheme highlights Council's commitment to maintaining and enhancing the cosmopolitan range of business activity centres across the municipality to continue to meet community needs and preferences for retail, entertainment, office and other commercial services. The proposal facilitates the establishment of a new retail development on vacant land within an established retail precinct.

Accordingly, the proposal will assist in achieving the objective to cluster retail activities and consolidate these uses within an existing activity centre and will implement key planning policy frameworks of the Monash Planning Scheme.

However, in order for the area to develop in an orderly manner it is also considered prudent that some thought be given to rezoning the balance of the Business 3 land located at the intersection of Warrigal Road and Centre Road to Business 1 and the Minister should be advised accordingly.

Setbacks

The proposed 6.2 metre setback to the Warrigal Road frontage is considered satisfactory and provides for an appropriate transition within the streetscape. It is noted that the Monash Planning Scheme does not specify setback requirements within a Business 1 Zone. Under the existing Business 3 zoning a 20 frontage setback is designated for both Warrigal and Centre Roads. However, given the proposed development will reinforce the retail and commercial nature of the area, the removal of the setback requirement is consistent with the objective to develop vibrant activity centres that provide a focal point for the community.

The site falls significantly from Warrigal Road to a lower ground level which reduces the impact of the proposed building from the street. In addition, the retention of trees and addition of infill planting within the front setback will aid in softening the building when viewed from Warrigal Road. It is noted that approximately 100 canopy trees are to be planted throughout the car park area with additional canopy trees planted around the perimeter of the site.

Although a Design and Development Overlay is not applicable for a Business 1 Zone under the Monash Planning Scheme, it is considered that the existing 6 metre setback requirement to the northern boundary should be retained and included in a new schedule to the Design and Development Overlay to ensure that the amenity of residential properties is maintained in the future in the event that the current application does not proceed.

Traffic and Car Parking

A total of 629 car parking spaces are to be provided on site.

Under the provisions of the Monash Planning Scheme the car parking rate for a shop is specified at 8 spaces to each 100 square metres of net floor area however it has been well documented and supported within the industry over recent years that a ratio below the planning scheme requirement is adequate for large free

standing shopping centres given the marked change in shopper habits and patterns resulting from the deregulation of shopping hours and the onset of internet shopping. Accordingly, a ratio of 5 spaces to each 100 square metres of net floor area is considered applicable and has been used by Council in other applications for supermarkets within the municipality.

There is no specified rate for the home improvement store however Council has previously used a rate of 2.5 spaces to each 100 square metres of net floor area for restricted retail premises which is considered applicable in this case.

Using the above rates, car parking for the proposal is required as follows.

Use	Floor Area sqm	Car Parking Requirement	No of Car Parking Spaces Required
Supermarket	3,800	5 spaces/100m ²	190
Speciality Shops	1,100	5 spaces/100m ²	55
Home Improvement Store(Restricted Retail/Trade Supplies)	13,443	2.5 spaces/100m ²	336
Total			581

As a total of 629 car parking spaces are to be provided on site, a surplus of 48 car parking spaces is created. The Traffic Report submitted with the application indicates that there is potential for the surplus to be used in the future for the 'Future Development Site 1' which is located in the southwest corner of the site.

Overall it is considered that the provision of on-site car parking is considered satisfactory.

The proposal was referred to Council's Traffic Engineers for comment and a number of concerns have been raised and are details as follows:

Site Access

- Signalised intersections are proposed for both access points in Warrigal Road and Centre Road. There is concern that the traffic report suggests that exclusive left turn lane/slip lanes are not necessary on either road in order to be consistent with the existing crossovers adjacent to and opposite the site. This is not considered to be a significant argument against the provision of left turn lanes. The report also argues that these are not feasible to construct due to the narrow nature strip and the presence of fragile services within the nature strip. Similar developments located on Warrigal Road and Centre Road in the vicinity of this proposal (Bunnings at 1126 Centre Road & Safeway at Warrigal Road/North Road) have provided left turn slip lanes at their entrance points.
- The traffic report Section 4 identifies that there are existing uses which currently take access from Warrigal Road and Centre Road in the vicinity

of the signals. These are proposed to be restricted to left-in/left-out movements on the approach and departure of the signalised intersections by way of modified line marking. There is no assessment of the impact of these proposed turn bans.

- The traffic report is considered to overestimate the “multi-trip” and “passing trade” factors in calculating traffic generation figures. A factor of 10% for multi-trip peak hour trip ends and an additional factor of 30% for “passing trade” applied to site-generated traffic in peak hours are not substantiated and effectively reduce the calculated traffic impact on the adjacent roads. The RTA Guide to Traffic Generating Developments (2002) suggests a rate of 20% for shopping centres of this size.
- As the Centre Road access is proposed to be signalised, further consideration of the design of the intersection between the proposed internal roadway and the warehouse roadway is required.

Car Parking

- It is suggested that the four car parks located within the landscaped area on the north side of the entrance roadway may create congestion and should be removed.

Loading facilities

- The impact on adjacent residents to the proposed loading areas located along their rear boundary is of concern. There are concerns about the noise and vibration generated by loading vehicles reversing and idling, which may not be eliminated by the provision of an acoustic fence. Practice has shown that imposing constraints on loading vehicles during night-time hours at other locations are usually beyond the operator’s control and have not overcome these issues.
- Austroads Design Prime Mover & Semi-trailer (19.0m) requires a minimum radius of 15.0m excluding vehicle overhang. There is concern that the truck turning circle of 14.0m will be inadequate and should be increased.

Pedestrians

- The locations of the two easternmost raised pedestrian crossings do not provide a landing area for pedestrians on the car park side of the crossing.
- Disabled parking bays outside the supermarket do not appear to provide a footpath for persons with disabilities to safely access the shopping centre.

Amenity

Unfortunately the location of loading facilities for the complex are located north of the proposed building which is adjacent to the existing residential area and could lead to adverse amenity impacts. It is assumed that the reason for this location is due to the size requirements of the proposed building on the site which would be standard product for the company.

In order to counteract any amenity impacts the applicant is proposing to construct a 4 metre to 4.5 metre high acoustic fence located 5.2 metres from the northern boundary.

An Acoustic Report submitted with the application indicates that noise control measures can be designed for the site to meet the noise limits as required under the State Environment Protection Policy no. N1 " Control of Noise from Commerce, Industry and Trade (SEPP N-1). The acoustic fence is one of the measures highlighted in the report. Accordingly, conditions incorporating these measures should be included on any permit issued to ensure that noise generated by the development complies with the SEPP N-1.

Deliveries are proposed to occur between 6am to 10pm seven days a week. As detailed in the traffic section above, there are concerns relating to the regulation of the hours of delivery and future enforcement. At the very least specific conditions should be included on any permit issued to stipulate and control delivery times and collection of waste to ensure the amenity of residents is protected.

Details of proposed lighting on the site have not been provided and there is concern that if deliveries are to occur of an early morning and evening, then lighting could spill into residential properties. Any lighting should be designed and baffled to prevent overspill into the surrounding residential area.

A copy of the draft conditions as proposed by the applicant are contained in Attachment 4.

CONCLUSION

The proposed rezoning of the site to a Business 1 Zone and development of the land for a supermarket and home improvement store is considered satisfactory subject to a number of concerns being addressed prior to approval.



CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

PROJECT:	Links Retail Development
ADDRESS:	1041 Centre Road, Oakleigh South Victoria 3167
JOB NO.:	10-008

PROJECT CONTACTS		
Construction Manager:	Len Simpson	0400 033 116
Project Manager:	Stephen Keen	0429 932 088
Site Supervisor:	Brian Zimmerling	0417 592 516
Contract Administrator:	Mario Nasello	TBA
Senior WHSO:	TBA	TBA

Approved by:

Date: 09 March 2011

Position:

Project Manager

ISSUE NO.: 1
19 December 2007

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Section 1 Environmental Policy

Pellicano Builders Pty Ltd is committed to environmental management best practice and to the responsible management of all construction projects with the least possible impact on the Environment.

To ensure that environmentally responsible behaviour is accepted as a fundamental part of our operations, we are committed to;

- The continuous improvement of our Environmental Management System, through a process of ongoing monitoring through regular audits and performance review;
- Recognising our obligations to the community through compliance with relevant legislation and regulations.
- Managing the activities over which we have control and that impact upon the environment in accordance with the principles of ecological sustainability;
- Minimising the environmental impact of our actions on air and water quality, soil and vegetation
- Ensuring that an environmental risk analysis is performed and safe work methods are implemented to eliminate harm to the environment;
- Minimising waste by management practices
- Providing appropriate training and information to our employees, sub-contractors and suppliers to ensure that the requirements for environmental responsibility are clarified and understood, and;
- The use of building materials and products that have the least impact on the environment.

**This policy reflects the importance Pellicano Builders Pty Ltd places on the company's
environmental responsibilities and performance**

**Michael Pellicano
Managing Director**

Section 2 Project Scope

2.1 Construction Environmental Management Plan Objective

This Construction Environmental Management Plan ("CEMP") has been developed to mitigate the potential impact on the environment of the proposed Retail Complex Development and associated civil works, car parking and loading bays, with landscaping to external areas, at 1041 Centre Road, Oakleigh South Victoria 3167 during the course of construction. It is also to ensure that all environmental safeguards are carried out correctly, site activities are well managed, that the biodiversity of the site is conserved or enhanced and that all relevant legislative requirements pertaining to environmental management are complied with.

2.2 CEMP Context

This CEMP has been developed in the design and planning stages of the project, and has been prepared in accordance with the guidelines provided by the Pellicano Group.

2.3 Project Description

The building structure will comprise of single level development consisting concrete floor slabs, precast concrete walls and structural steel components, which will provide approximately 23,000m² of total floor space. Vehicular parking will be provided for visitors and employees.

2.4 Commencement and Duration of Construction

Construction works are anticipated to commence in March 2011 and are programmed for completion by March 2012.

2.5 Legal Requirements

The following statutes are required to be considered during the preparation of this CEMP and throughout the course of construction:

- Environmental Protection & Biodiversity Conservation Act 1999
- Hazardous Goods Safety Management Act 2001
- Dangerous Goods Safety Management Act 2001
- Environmental Protection Act 1994
- Airports (Environment Protection) Regulations 1997
- Airports (Building Control) Regulations 1996
- Plant Protection Act 1989

2.6 Environmental Risk Assessment

Prior to works commencing on site, during the design phase, an Environmental Risk Assessment shall be conducted to identify the likelihood and consequences of all potential risks to the environment during the construction process. This assessment shall also document the required control measures for implementation to mitigate the impact of such risks on the environment.

The environmental and social factors identified for consideration in the development of this CEMP are:

- Geology, Soils & Topography Ecology
- Hydrology & Water Control
- Meteorology & Air Quality
- Noise
- Land Use
- Landscape
- Socio-economics
- Cultural / Archaeological Heritage
- Waste
- Traffic Management
- Hazardous Goods & Chemicals

When assessing the degree of risk of environmental harm, the table below shall be used based on the likelihood of the occurrence and the potential consequence.

CONSEQUENCE	LIKELIHOOD			
	Rare	Unlikely	Likely	Certain
Catastrophic	Medium	Significant	Significant	Significant
Major	Medium	Significant	Significant	Significant
Moderate	Low	Medium	Significant	Significant
Minor	Low	Low	Medium	Medium

2.6 Supplementary Documents

This CEMP document has been developed in association with the:

- "Geotechnical Report" prepared by Coffee Geotechnics Pty Ltd – Report No.GEOTABTF06081AA-BX dated 29.06.2010.
- Risk Management Plan for the Construction Site.

2.7 CEMP Review, Variations & Amendments

All amendments to this CEMP as a result of the changing needs and monitoring of the effectiveness of the mitigation measures, will be listed in this section (S.2.7), indicating the date amendments are agreed to, whom agreed to the changes and will include a summary of the agreed changes.

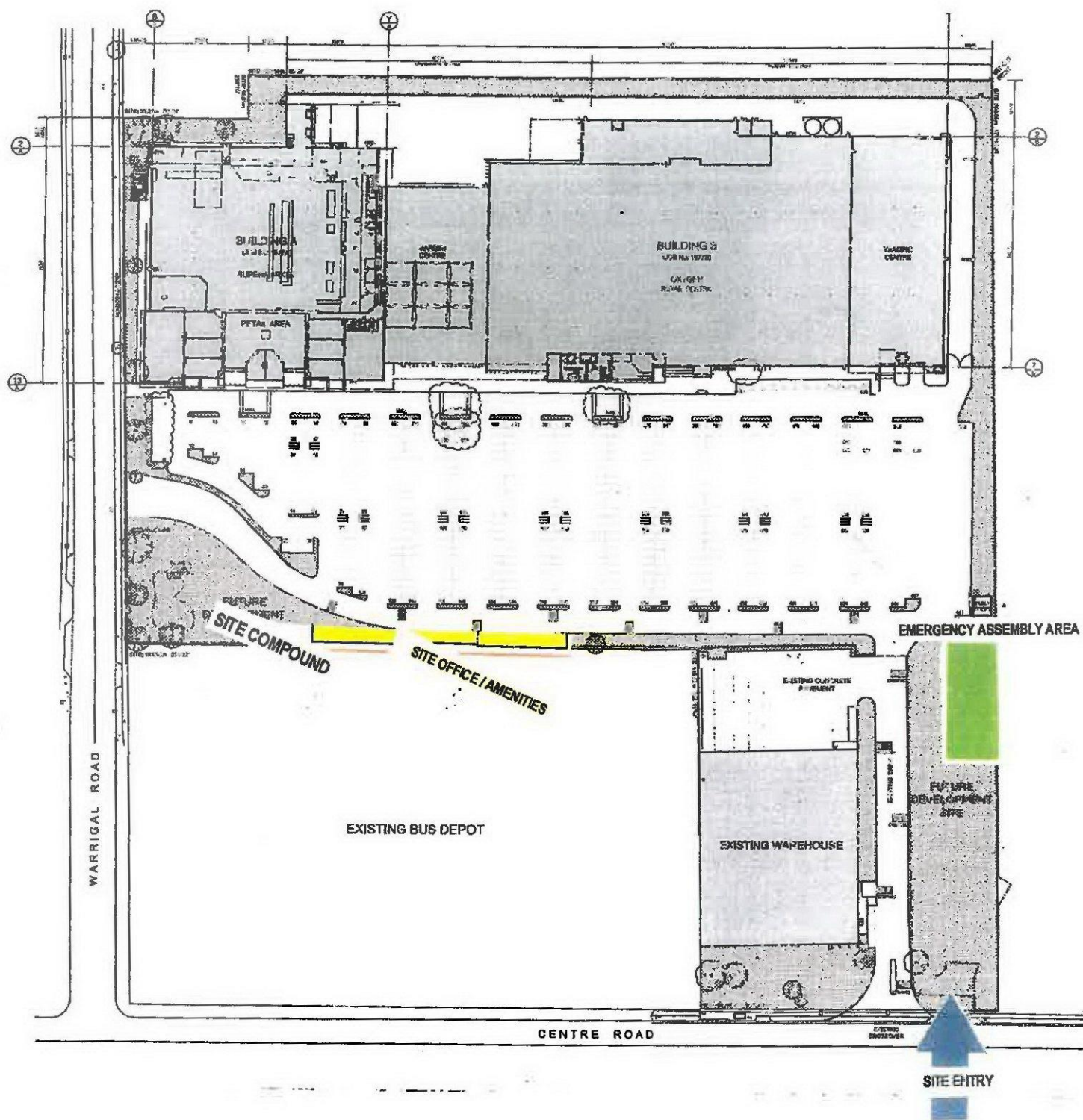
2.8 Permits and Approvals

The proposed office building is subject to following permits, approvals and authorisations:

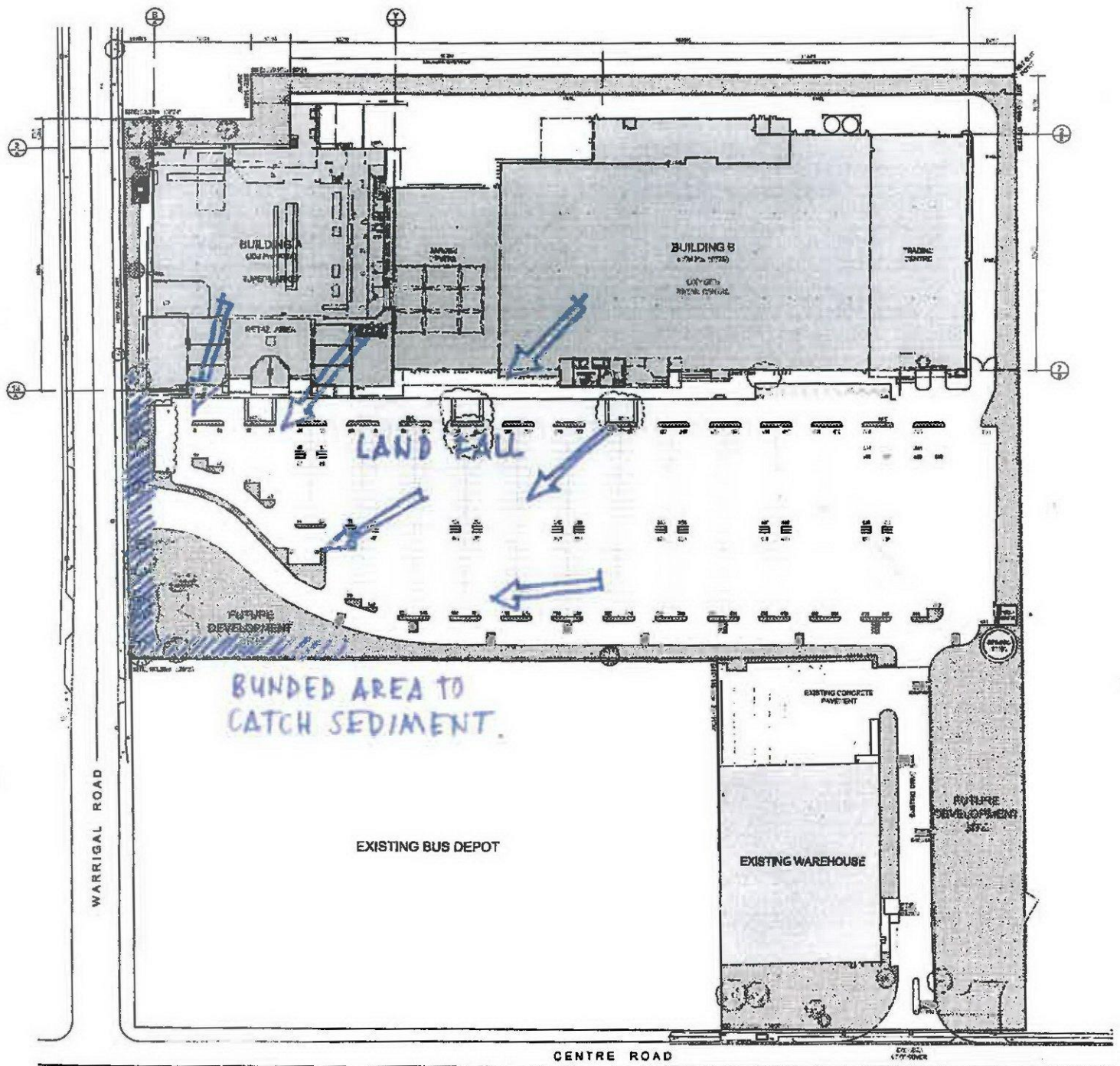
Permits

- Planning Permit No. 38868/A dated 30.11.2010.
- Building Permit No.005429-1 dated 27.01.2011.

2.9 Site Layout Plan



2.10 Erosion and Sediment Control Plan



Section 3 Responsibilities

3.1 Management Responsibilities

The **Managing Director, General Manager and Construction Manager** are directly responsible for the corporate aspects of Environmental Management and for the overall performance of Pellicano Builders Pty Ltd in relation to the implementation of systems to eliminate harm to the environment.

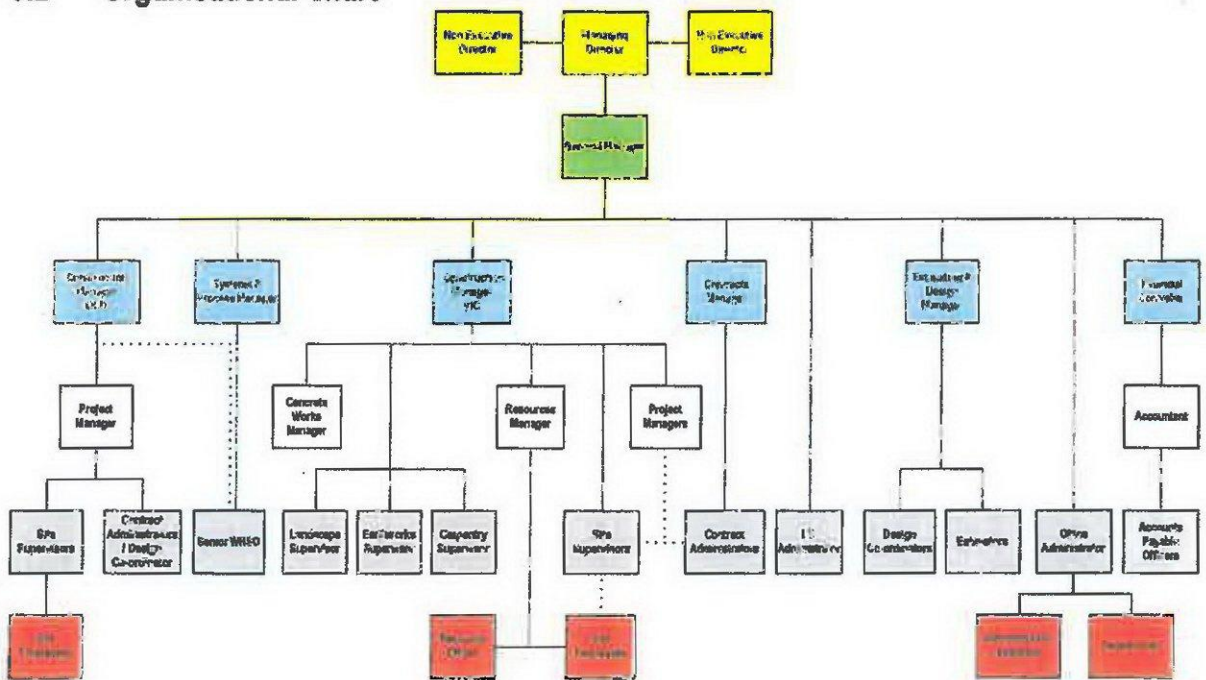
The **Project Manager** is responsible for the implementation and management of the Environmental Management System in accordance with this CEMP and current legislation.

The **Site Supervisor** has responsibility for the day to day monitoring and compliance of this process by site employees, and **Sub-contractors**. The **Site Supervisor** is required to check and approve of any Work Method statements provided prior to commencement of any task which relates to environmental concerns, to ensure compliance in accordance with this document.

The **Site Supervisor** is also responsible for ensuring the Site Specific Induction is undertaken by all site personnel and visitors, conducted by himself or by an assistant delegated by him, to train and communicate the environmental risks on the site and control measures required.

The chain of responsibility and reporting for Construction and site environmental management on this project is illustrated below.

3.2 Organisational Chart



Note:
The Systems and Process Manager has the responsibility to manage the implementation of the company's policies and procedures relating to OH&S Management, Environmental Management and Quality Management.

3.3 Other Responsibilities

All Pellicano Builders employees, subcontractors and consultants working on the project site have a responsibility to comply with the company's CEMP and all relevant legislation, and to report any potential incident that could bring harm to the environment.

Sub-contractors and consultants are required to comply with this Construction & Site Management Plan and to submit task specific Work Method statements, including any reference to their methodology for dealing with any environmental issues pertaining to their work.

Section 4 Environmental Monitoring

Purpose:

To ensure that all planned environmental controls are in control and effective, regular monitoring of these controls will occur on the project site.

4.1 Monitoring Format and Frequency

Environmental monitoring will be an ongoing activity throughout the course of construction, and will require daily, weekly, fortnightly inspections, and random inspections before anticipated rain fall and subsequent to any significant rain fall.

In addition, the CEMP will also be audited on a bi-monthly basis by a suitably qualified internal auditor (Refer to Appendix 2 for the format and components of the audit process).

4.2 Monitoring Activities

Frequency	Monitoring Activity	Responsibility
Daily	Check all sediment control fences and repair if required	Site Supervisor
	Inspect cattle grate and clear residual sediment if required	WHSO/Labourer
	Sweep roadway of soil and waste if required, do not hose with water	WHSO/Labourer
	Check all long stockpiles are covered securely	Site Supervisor
	Check waste materials are correctly sorted and stored	Site Supervisor
	Check waste bins are securely covered	Site Supervisor
Weekly	Check noise suppression devices on equipment	Site Supervisor
	Check containers of hazardous goods / materials are properly stored & not damaged	Site Supervisor
	Check dust filters on equipment	WHSO/Labourer
	Visual check on vehicle and equipment air emissions. Service if unsatisfactory.	WHSO/Labourer
Fortnightly	Clean out uncontaminated sediment from silt fences and return to secure stockpile	WHSO/Labourer
Before Rain	Inspect all sediment control structures	WHSO/Labourer
After Rain	Inspect all sediment control structures	WHSO/Labourer
	Clean out uncontaminated sediment from silt fences and return to secure stockpile	WHSO/Labourer
	Check all drains are free from waste or debris	WHSO/Labourer

Weekly Environmental Inspections are to be conducted by a suitably qualified and appointed representative of PB, a may also include selection of sub-contractors and employees on site, and is to be supported by the Site Supervisor and Project Manager. Non-compliance issues shall be reported first to the Site Supervisor, and then to the Project Manager in the event that compliance issues are not addressed satisfactorily, and will be addressed in order of priority.

These audits are to be conducted every Wednesday morning, between the Morning Tea and Lunch breaks, and copies of inspection results are to be faxed to the Systems & Process Manager weekly.

4.3 Bi-monthly Audits

General Environmental management compliance audits shall be conducted by the **Systems and process Manager, or Senior WHSO**, or other suitably qualified approved representative of PB. The audit will monitor and assess the implementation of all mitigation measures and the management of environmental issues on site.

Refer to Appendix 3 for a copy of the Environmental Audit Checklist (PB-EAC-01)

This audit will inspect, but will not be limited to, the following:

- Filing of Induction Records and Procedure
- Required environmental signage and notices
- Risk Control measures - JSA's & MSDS – currency and filing
- General Site housekeeping
- Observance of PPE Policy
- Correct & safe use of Plant and Equipment
- Storage of equipment, materials and hazardous substances
- Sediment controls

Results are to be reported to the **Construction Manager** and corrective actions closed out by the **Site Supervisor**, in order of priority by the date nominated by the auditor.

Section 5 Environmental Training

Purpose

This section details the procedures and guidelines to be used for the induction of new employees and Sub-contractors, to ensure that each person receives the appropriate training and information required to perform their roles, responsibilities and tasks, and that full training records are established prior to commencing work.

5.1 Training Support

Environmental training support will be provided by PB on an as needs basis, determined by the site requirements, specific training requirements for relevant employees, individual workers familiarisation with site environmental controls, and will extend to PB employees and subcontractors as required. Environmental training may include, but will not be limited to:

- Site Specific Induction
- Emergency response Training
- Installation of erosion and sediment controls,
- Cleaning up spills,
- Daily inspections of environmental controls.
- Identification and management of Fire Ants & Acid Sulfate Soils

5.2 Site Specific Induction for Site Personnel & Visitors to Site

Segment 3 Inductions are to be completed by all personnel whom work on or visit the construction site, and are to be tailored to match the level of involvement or time spent on the site. These site inductions shall include training on all aspects of site safety and environmental management for all workers (direct employees and subcontractors) and visitors.

Upon arrival on any Pellicano Builders Pty Ltd construction site for the first time, all employees and sub-contractor personnel are required to participate in the Site Specific Induction (Segment 3 – Level 1), prior to commencing any work. All visitors (including Pellicano Builders Pty Ltd staff) to the site for the first time are to participate in the Site Specific Induction (Segment 3 – Level 2).

These are to be conducted by the Site Supervisor or OH&S Representative or an employee trained for and delegated the task by the Site Supervisor.

Level 1	Employees and Sub-contractors working on the site
Level 2	All visitors to the site, including Pellicano Builders Pty Ltd staff visiting the site.

The record of the Induction is to be signed by both the person providing the induction and the inductee. This record is to be filed on site by the Site Supervisor.

Refer to the 'Site Induction Handbook' and 'Site Induction Checklist - Segment 3' (Levels 1 & 2) to identify items to be covered in this induction.

This CEMP will also be made available for all employees and subcontractors upon induction onto the site, and additional training needs will be reviewed and implemented throughout the construction program on a needs basis.

References	Form No. PB-SIC-01 (Site Induction Checklist – Segment 3, Level 1)
	Form No. PB-SIC-02 (Site Induction Checklist – Segment 3, Level 2)
	Form No. PB-SIF-01 (Site Induction Form – Level 1 Site Personnel)
	Form No. PB-SIF-02 (Site Induction Form – Level 2 Site Visitors)
	Form No. PB-SIH-01 (Site Induction Handbook)

*Construction Environmental Management Plan***Section 6 Incident Reporting****Purpose**

To ensure that all incidents that have, or could have had a negative impact on the environment, are accurately reported, recorded and investigated, and that corrective action can be taken to prevent their recurrence.

Scope

Pellicano Builders Pty Ltd undertakes a responsibility to ensure all incidents which have a direct impact, or could have had a direct impact on the environment as a result of the construction process are reported, recorded and investigated, as a means of preventing recurrence and to provide management with a system of monitoring the effectiveness of remedial actions.

The process aims to identify the causes of any incident in the formulation of such a corrective action plan, and to maintain historical records of environmental incidents and action taken.

6.1 Reporting Requirements

In the event of an incident, the following reporting process must be adopted by all personnel involved:

- All incidents resulting in a negative impact on the environment, must be recorded in the **Environmental Incident Notification Form**
- All **Class 1, Class 2** or '**Notifiable Dangerous**' incidents are to be reported to the **Construction Manager** and **Project Manager** by the **Site Supervisor** immediately, and an **Environmental Incident Notification Form** sent to the **Pellicano Builders Pty Ltd's** head office within (24) hours of the incident occurring;
- All **Class 1, Class 2** or '**Notifiable Dangerous**' incidents are to be reported to the **EPA** immediately, and an **Environmental Incident Notification Form** sent to **EPA** and the **client** within (48) hours of the incident occurring.
- All **Class 3** incidents are to be reported to the **Systems & Process Manager** and an **Environmental Incident Notification Form** sent to the **Systems & Process Manager** within (24) hours of the incident occurring;
- All environmental incidents shall be logged onto an **Environmental Incident Register** by the **System & Process Manager** upon receipt, for monitoring and corrective action implementation;
- All records, notification and investigations of accidents shall be kept for (5) years, or as required by legislation

Reference: [PB-EIN-01 \(Environmental Incident Notification Form\)](#)
[PB-EIR-01 \(Environmental Incident Register\)](#)

Section 7 Consultative Process

7.1 Consultation Methods

Toolbox meetings will be held weekly (Wednesdays) for all workers on site, to address issues relating to site safety and environmental issues.

Proposed work activities of a high risk nature, are to be planned and documented (JSA) in consultation with those required to perform the task. Once documented, the JSA is to be communicated to all workers performing the work, to ensure the instruction on Risk Management is adopted and understood.

7.2 Dispute Resolution

The agreed procedure is as follows:

- Where an employee identifies an environmental issue, they should raise it with their immediate supervisor. The employee or supervisor should inform both the employer representative and the employee representative for the designated work group.
- The issue should be dealt with as soon as possible after being reported. If it cannot be rectified immediately then a solution should be implemented as soon as practicable. As a minimum, interim measures should be put in place to prevent any adverse consequences until such time that the issue can be satisfactorily resolved.

Note: A specialist may need to be engaged for advice, (eg hygienist for air monitoring).

- An employee representative has the power to issue a Provisional Improvement Notice (PIN) where an issue fails to be resolved. Where the issue concerns work which involves an immediate threat to the environment, the employee representative or employer representative may direct that work will cease. Where an issue or an immediate threat remains unresolved, the employee health and safety representative or employer representative may request the assistance of an EPA Inspector.
- The issue and agreed outcomes should be communicated to all designated work groups.
- Solutions should be recorded as well as communicated to relevant employees for their information.

Section 8 Emergency Procedures - Environmental

Purpose

Emergency procedures are plans of action to be taken in the event of serious. It is important to ensure that adequate planning is undertaken to minimise the impact of possible threats to life and / or damage to property.

Project Managers and Site Supervisors are required to ensure:

- Compliance with guidelines for providing trained Emergency Control Organisation and ensure their availability;
- Ensure Site Emergency procedures are established and implemented upon Site set up, in collaboration with **Site Supervisor** and **WHS/OH&S Representative**.
- A current list of Wardens is available to all personnel, and their training needs are reviewed and maintained;
- That all emergencies are reported and recorded, in accordance with the Accident / Incident Reporting procedure.

Employees and Sub-contractors are required to:

- Co-operate with the Emergency Control Organisation (ECO) and company safety procedures in all cases of emergency.

8.1 Evacuation Plan

The evacuation plan and designated Assembly Area is to be displayed prominently for all personnel working on or visiting site. All personnel on site at the time are to relocate to the Assembly Area upon the sounding of the emergency horn / siren.

8.2 Emergency Contacts

All Emergency Contact details shall be displayed prominently around the site. These shall include, but will not be limited to, the following:

- Site Supervisor
- Workplace Health and Safety Officer
- WHS Representative
- First Aid Officers
- Wardens
- Local Medical Clinic / Hospital
- Fire Brigade
- Police
- Ambulance
- Workplace Health & Safety Queensland
- Environmental Protection Agency
- Local Council
- Gas Authority
- Electrical Authority
- Water Authority
- Poisons Information Centre

Construction Environmental Management Plan**8.3 Response and Communication**

In the event of an Emergency, that person who first identified the dangerous situation (whether it to the health and safety of others or potential harm to the environment), shall immediately advise the **Site Supervisor**, or **Chief Warden** on site. An assessment will be then made as to whether a site evacuation is required, and which relevant Authority is to be contacted.

In the event of an evacuation, the **Site Supervisor**, or **Chief Warden** shall authorise the sounding of the evacuation siren, upon which all site personnel will proceed calmly to the designated Assembly Area. All personnel will be counted to ensure all have been removed to safety, while the relevant authority remedies the situation, and all shall remain in the designated Assembly area until such time that the relevant authority deems it safe to return to the work area.

Emergency	Response
Injury	<ul style="list-style-type: none"> • Refer to: 'If you are injured' chart displayed in the site amenities. • Follow the Pellicano Builders Pty Ltd OH&S System and procedures for Accident / Incident reporting (Section 6, OH&S Management System) • If an incident is considered to result in a Class 1 or Class 2 Incident, it must be reported to immediately to WorkSafe/WHSQ, and documentation of the incident reported within (24) hours of its occurrence. • If considerable impact is made to the environment, the incident is to be referred to the EPA immediately.
Fire	<ul style="list-style-type: none"> • Refer to: 'What to do if you see a fire wall chart displayed in Site Office'. • Evacuate all site personnel to the safe assembly area immediately as per the Pellicano Builders Pty Ltd Site Safety Plan. • Call the Fire Brigade (Emergency Services). • If a threat exists, notify the neighbours. • Notify the Pellicano Builders Pty Ltd's Project Manager and Construction Manager immediately. • Investigate the incident and an Accident / Incident Notification Form is to be completed.
Explosion or Gas Leak	<ul style="list-style-type: none"> • Evacuate all site personnel to the safe assembly area immediately as per the Pellicano Builders Pty Ltd Site Safety Plan. • Call the Fire Brigade (Emergency Services). • If a threat exists, notify the neighbours. • Contact the appropriate service provider (eg if a gas explosion contact the gas provider). • Notify the Pellicano Builders Pty Ltd's Project Manager and Construction Manager immediately. • Investigate the incident and an Accident / Incident Notification Form is to be completed.
Spill	<ul style="list-style-type: none"> • For a major spill, immediately contact the Fire Brigade. • Identify source of spill. • Refer to MSDS, and quickly evaluate the hazards. • If the hazard is high evacuate the site personnel to the assembly area immediately. • If a threat exists, notify the neighbours. • If it is safe to do so, stop the source of the spill immediately, or contain the spill and control its flow. • Block any stormwater drains downslope of the spill. • Clean up any small spills immediately. • Notify EPA and Local Council if there is any threat to the environment. • Notify Department of Land and Water Conservation if the spill is likely to impact on the water catchment area. • Notify the Pellicano Builders Pty Ltd's Project Manager and Construction Manager immediately. • Investigate the incident and an Accident / Incident Notification Form is to be completed.

Section 9 Project Activities, Environmental Factors & Mitigation Measures

Purpose

The aim of this section is to identify the environmental factors that may be impacted upon by the project activities, and the required mitigation measures that will be implemented to minimise or eliminate this risk.

9.1 Geology, Soils & Topography

Sediment control and the potential presence of Acid Sulfate soils (ASS) are the significant Environmental factors that require close monitoring and management throughout the construction phase of the development.

Environmental Factor	Impacting Trades / Activities	Risk Level	Mitigation Measures	Responsibility
Sediment & Weed Control	ALL TRADES / ACTIVITIES	MEDIUM	• Construction activities will be confined to within the construction area;	Site Supervisor
			• Sediment control measures such as sandbags will be placed around stormwater inlets near the site to prevent sediment entering stormwater as required.	Site Supervisor
			• The site entry / exit will be established with an appropriate cattle gates to prevent sediment entrainment on surrounding roads;	Site Supervisor
			• A spill kit will be available on site to enable rapid mitigation of any spills and prevent soil or water contamination;	Site Supervisor
			• Stockpiles to be placed away from drainage lines and if long term, are to be covered or stabilized to prevent corrosion; and	Project Manager
			• All erosion and sediment control measures will be monitored for effectiveness regularly (daily) and repaired as required	Site Supervisor
			• Baled straw to be used in lieu of hay to reduce the likelihood of the spread of weeds as required.	Site Supervisor
			• If the material is wet, it will be replaced and covered within 24 hours	Site Supervisor
			• Where this is not possible, the material will be removed from the site and taken to a licensed landfill for disposal at the end of each working day. A suitably licensed professional will be identified to undertake such transport)	Site Supervisor
			• Workers to be trained and notices displayed in prominent positions around site advising workers how to identify ASS and what to do in the event of discovering ASS	Site Supervisor
• Sediment dam has been established in the South West corner of the allotment adjacent to Warragul Road.	Site Supervisor			
Presence of Acid Sulfate Soils	ALL TRADES / ACTIVITIES	LOW		

9.2 Ecology

Construction Environmental Management Plan

The fact that the site is situated in a declared Fire Ant Restricted Zone requires strict management of this ecological issue, and compliance with the regulatory requirements of the Department of Primary Industries and Fisheries. This remains the key ecological factor that will require ongoing implementation of the mitigation measures.

Environmental Factor	Impacting Trades / Activities	Risk Level	Mitigation Measures	Responsibility
	Earthworks (Excavation, plumbing, electrical, concreting)	SIGNIFICANT	<ul style="list-style-type: none"> • PB shall comply with EPA guidelines for the transport of soils and materials. • No Dogs or animals are to taken onto site; • A site inspection must be conducted by a DPI&F Inspector or Approved Person prior to moving or disturbing any soil; • All high risk materials must be treated before being moved out of the restricted area; • High risk materials include, but are not limited to, soil & potting mix, turf, baled hay & straw, pot plants, mulch/green waste/fuel. • The site will be landscaped with appropriate native species to prevent the establishment of weeds, in accordance with the Landscape Masterplan; and, • PB will also identify any weeds that emerge on site in order to remove and prevent their spread as soon as possible 	Project Manager / Site Supervisor Site Supervisor Site Supervisor Site Supervisor Site Supervisor

9.3 Hydrology & Water Quality

Maintenance of water quality and prevention of pollutants entering the surrounding catchment sources are the significant factors that require mitigation measures to be adopted.

Environmental Factor	Impacting Trades / Activities	Risk Level	Mitigation Measures	Responsibility
Discharge of sediment into stormwater	ALL TRADES / ACTIVITIES / HEAVY RAINFALL	MEDIUM	<ul style="list-style-type: none"> • Adherence to the erosion and sediment control measures above; • Machinery and equipment will not be washed at the site but excess sediment will be removed from wheels to prevent entrainment of sediment onto precinct roads; • Any chemicals, fuels or paints at the site will be stored in a designated, bunded area to prevent spills from entering stormwater channels; and • Refuelling of vehicles at the site will be conducted away from drainage lines and a spill kit will be kept on site to appropriately mitigate any spills • Roadway exits from site will be monitored daily and swept in the event of residual sediment being present • Establish controlled washout areas within the construction area, away from stormwater drains 	Site Supervisor Site Supervisor Site Supervisor Site Supervisor Site Supervisor Site Supervisor

9.4 Meteorology & Air Quality

The potential for air quality to be impacted through the generation of dust during the construction phase is determined as the significant environmental hazard that may develop during the construction phase.

Environmental Factor	Impacting Trades / Activities	Risk Level	Mitigation Measures	Responsibility
Dust Generation	BULK EARTHWORKS / EXCAVATION / LANDSCAPING / CONCRETING/ BRICKLAYING/ PC PANEL ERECTION/ STRUCTURAL STEEL ERECTION	LOW	<ul style="list-style-type: none"> • All machinery and equipment used at the site will be maintained to relevant standards to reduce emissions to as low as possible; • Disturbed areas will be revegetated as soon as practicable after the construction of the works; • Earth wetting will be undertaken as required during construction to minimise dust generation at the site; site not to be "over wet" so as to create a contamination issue on Centre Road from departing trucks. • Long term stockpiles will be covered or vegetated to prevent wind erosion; and, • Trucks travelling to or from the site will be covered to prevent wind blown dust. • Fit dust catchers to equipment where available and wear appropriate PPE (Face masks or respirators) 	Site Supervisor Project Manager Site Supervisor Site Supervisor Site Supervisor All Workers

9.5 Noise

The additional generation of noise through the use of plant, machinery, vehicles and equipment is identified as the key potential hazard to the environment. Noise levels shall be maintained within relevant standards, including Schedule 4 of the *Airports (Environment Protection) Regulations 1997*, which requires the following allowable levels:

- Construction, maintenance and demolition 75dB(A) L10(15min)
- Road traffic A) Leq(24hr)

Environmental Factor	Impacting Trades / Activities	Risk Level	Mitigation Measures	Responsibility
Excessive Noise Generation	ALL TRADES & ACTIVITIES INVOLVING PLANT, MACHINERY, ELECTRICAL TOOLS, VEHICLES	LOW	• Equipment and vehicles used during the works are to be adequately maintained and serviced to ensure that noise levels associated with operation are as low as can reasonably be achieved;	Site Supervisor
			• Noise will be included in the weekly environmental checklist to note any activities on site causing excessive noise and identify if any mitigation measures are required; and	Site Supervisor
			• Noise levels are to be controlled such that complaints are not received from the public.	Site Supervisor
			• Hearing protection to be used and available on site	Site Supervisor
			• Avoid use of loud radios	Site Supervisor
• All items of plant to undergo Plant induction upon arrival and prior to use on site, and be recorded on the Plant Register	Site Supervisors			

9.6 Land Use

The impact on the surrounding land uses is assessed as low during construction, providing the nominated noise, traffic and air quality controls are implemented

Environmental Factor	Impacting Trades / Activities	Risk Level	Mitigation Measures	Responsibility
Impacting surrounding land uses	ALL TRADES/ ACTIVITIES	LOW	<ul style="list-style-type: none"> • Noise and air quality control measures will be undertaken as outlined • Traffic management required to ensure minimal impact upon existing vehicular traffic for surrounding operations 	Site Supervisor

9.7 Landscape

During the course of construction, the general landscape will be temporarily affected and will require appropriate controls to minimise the impact.

Environmental Factor	Impacting Trades / Activities	Risk Level	Mitigation Measures	Responsibility
Landscape Impact	ALL TRADES/ CONSTRUCTION ACTIVITIES	LOW	<ul style="list-style-type: none"> During the construction phase screening will be used where necessary to prevent the spread of dust and will also serve to screen the construction site from surrounding land uses and mitigate the potential landscape impacts. 	Site Supervisor

9.8 Socio-economics

The direct impact of minor traffic disruptions, public and worker safety and potential for increased levels of dust and noise are identified as the main factors impacting on the Socio-economics of the area.

Environmental Factor	Impacting Trades / Activities	Risk Level	Mitigation Measures	Responsibility
Socio-economic Impact	ALL TRADES/ ACTIVITIES	LOW	<ul style="list-style-type: none"> During construction measures will be undertaken to minimise noise, dust and traffic impacts as outlined elsewhere in this plan. Safety will be managed in accordance with the applicable Workplace Health and Safety legislation and PB's OH&S Management System 	Site Supervisor Site Supervisor

9.9 Cultural / Archaeological Heritage

There are no known cultural heritage sites identified within the proposed development area, so the impact by the construction works is considered to be low.

Environmental Factor	Impacting Trades / Activities	Risk Level	Mitigation Measures	Responsibility
Impact on Cultural Heritage	EARTHWORKS/ EXCAVATION ACTIVITIES	LOW	<ul style="list-style-type: none"> Works will cease if any materials resembling indigenous artifacts or human skeletal remains are identified during the course of construction. All workers will be advised of this requirement during the Site Induction 	Site Supervisor Site Supervisor

9.10 Waste

The generation of waste materials during construction is considered to be a significant environmental factor which will require close monitoring and management throughout the course of construction.

Environmental Factor	Impacting Trades / Activities	Risk Level	Mitigation Measures	Responsibility
Accumulation of Waste	ALL TRADES / ACTIVITIES	MEDIUM	<ul style="list-style-type: none"> Designate specific areas on site for the temporary management of various waste streams i.e. general domestic waste, works waste and contaminated waste. All excess works material and solid material is to first be separated and collected into wastes that can be recycled and the remaining waste disposed of at a legally operating landfill. All domestic waste and industrial waste is to be disposed of into proper industrial bins. Ensure waste bin lids are closed to avoid littering, access by birds and scavenging by vermin, birds and native wildlife. Optimise use of works materials and where possible adopt a recycling policy. Recycle waste oils where possible. 	Site Supervisor All Workers Site Supervisor All Workers All Workers

9.11 Traffic Management

The increase in public road use in the surrounding area by construction vehicle traffic is considered the main impact on the local traffic infrastructure and will require management to minimise disruptions to the public and to ensure the safety of other road users.

Environmental Factor	Impacting Trades / Activities	Risk Level	Mitigation Measures	Responsibility
Increased Traffic Flow	ALL TRADES	Medium	<ul style="list-style-type: none"> Access routes will be defined for construction vehicles to ensure there is no interruption to other traffic in the precinct; and Construction vehicles will not park on roads in the precinct and as such will not block access by other vehicles. 	Project Manager Site Supervisor

9.12 Hazardous Goods & Chemicals

The handling and storage of Dangerous / hazardous goods and materials will require close monitoring and management to eliminate the impact on the environment and workers on the site.

Environmental Factor	Impacting Trades / Activities	Risk Level	Mitigation Measures	Responsibility
Spillage of dangerous / Hazardous Goods	ALL TRADES REQUIRED TO USE HAZARDOUS MATERIALS	Medium	<ul style="list-style-type: none"> • Establish a suitable dangerous goods storage area (in compliance with statutory regulations), including stores and waste chemical compounds. • Prohibit open containers being left out in the open and use drip trays when decanting materials. • Establish temporary bunding for hazardous material storage during construction. • All dangerous goods are to be stored in accordance with the <i>Dangerous Goods Safety Management Act 2001</i> and applicable BCC permits. • Any waste oils are to be collected and transported to recyclers or a designated disposal site as soon as possible. • Development of a spill control plan and education of workers in its provisions. • Obtain MSDS and make accessible to all personnel on site • Hazardous Chemicals to be recorded on the site Chemical Register, which provides a central listing of all hazardous substances which are used in the workplace, purpose and storage location 	<p>Site Supervisor</p> <p>Site Supervisor</p> <p>Site Supervisor</p> <p>Site Supervisor</p> <p>Site Supervisor</p> <p>Site Supervisor</p> <p>Site Supervisor</p>