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SPECIALISTS IN LIVING AND WORKING PLACES

CONTAMINATION ASSESSMENT 630 - 726 PRINCES HIGHWAY TEMPE

Prepared for:

Valad Property Group
Level 9, 1 Cheifley Square, Sydney, NSW 2000

Report Date: 10 September 2008
Project Ref: ENVILCOV00315AH

Written/Submitted by:	Reviewed/Approved by:
	
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SPECIALISTS IN LIVING AND WORKING PLACES

10 September 2008

Valad Property Group
Level 9, 1 Cheifley Square, Sydney, NSW 2000

Attention: Denis Ghersinich

Dear Denis

RE: Contamination Assessment of 630 - 726 Princes Highway, Tempe

Coffey Environments Pty Ltd (Coffey Environments) is pleased to provide a Contamination Assessment report for the abovementioned site.

This report should be read in conjunction with the attached “Statement of Limitations”, which contains important information about the report.

We trust that the report meets with your current requirements. Should you require further information, please do not hesitate to contact the undersigned.

For and on behalf of Coffey Environments Pty Ltd

Benedict Smith

cc

Attachment A: Attachments

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ABBREVIATIONS

AHD	Australian Height Datum
ALS	Australian Laboratory Services
ANZECC	Australian and New Zealand Environment and Conservation Council
AST	Aboveground Storage Tank
C6-C36	Hydrocarbon chainlength fraction
Bgs	below ground surface
BH	Borehole
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
COC	Chain of Custody
DLWC	Department of Land and Water Conservation (NSW)
DO	Dissolved Oxygen
EC	Electrical Conductivity
Eh	Oxidation/Reduction Potential
ESA	Environmental Site Assessment
GAL	Gribbles Analytical Laboratories
ID	Identification
IP	Interface Probe
H2SO4	Sulfuric Acid
HBSIL	Health Based Soil Investigation Level
HCl	Hydrochloric Acid
HNO3	Nitric Acid
LOQ	Limit of Quantification
LOR	Limit of Reporting

ABBREVIATIONS

MDL	Method Detection Limit
µg/L	micrograms per litre
mg/kg	milligrams per kilogram
mg/L	milligrams per litre
MW	Monitoring Well
NATA	National Association of Testing Authorities
NEHF	National Environmental Health Forum
NEPM	National Environment Protection Measure
NSW EPA	Environment Protection Authority of New South Wales
OCP	Organochlorine Pesticide
OPP	Organophosphorous Pesticide
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PID	Photoionisation Detector
PO	Purchase Order
Ppm	parts per million
ppmv	parts per million by volume
PQL	Practical Quantitation Limit
PSH	Phase Separated Hydrocarbon
PVC	Polyvinyl Chloride
QA	Quality Assurance
QC	Quality Control
RL	Reduced Level

ABBREVIATIONS

RPD	Relative Percent Difference
SB	Soil Bore
SOP	Standard Operating Procedures
SPH	Separate Phase Hydrocarbon
SWL	Static Water Level
TBM	Temporary Benchmark
TCE	Trichloroethylene
TD	Total Depth
TDS	Total Dissolved Solid
TOC	Top of Casing
TPH	Total Petroleum Hydrocarbon
UST	Underground Storage Tank
VOA	Volatile Organic Analysis
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

Coffey Environments Pty Ltd was commissioned by the Valad Property Group Ltd to undertake a Contamination Assessment at a site located at 630 - 726 Princes Highway, Tempe, NSW. It is understood that the land is proposed to be redeveloped into a large commercial development (a retail outlet) with associated car parking.

The objectives of the contamination assessment were:

- To identify potentially contaminating activities that are currently being performed on the site and that may have been performed on the site in the past;
- To make an assessment of potential contamination problems by undertaking sampling and testing; and
- To assess the suitability of the site for the proposed development and recommend further investigation/remediation requirements for the site to be suitable for the proposed use.

The site is located on the southern side of Princes Highway, Tempe NSW (Figure 1). The site consists of four different lots:

- Lot A DP 399884, including 630 Princes Highway
- Lot B in DP 399884, including 632 Princes Highway
- Lot A DP 385209 & Lot E DP 385210, including 634-726 Princes Highway.

No. 630 Princes Highway comprises an automotive workshop (KAS Auto). The site is approximately 0.2ha in size. Historical information indicates that the site was previously a service station with underground storage tanks in its western portion.

No. 632 Princes Highway comprises Kennards Self Storage, a large storage facility consisting mainly of rectangular, galvanised sheeting, single and double storey buildings. The site is approximately 2ha in size. The site was formerly a brick works, with an associated brick pit where the Tempe landfill is located.

No. 634 – 726 Princes Highway comprises a two storey brick warehouse structure that is currently occupied by a logistics company and tyre and alloy wheel storage facility. The site also has a Volkswagen garage to the rear. The site is approximately 2.9ha in size. The site was formerly the Ateco car parts manufacturing facility and prior to that a Penfolds Wines depot.

The field investigations were undertaken over 10 days on 19th through 31st May and 3rd June 2008 by Coffey Environmental Scientists.

A total of fifty one boreholes were drilled on site to collect soil samples and to assess the subsurface conditions. Environmental samples were collected from the near surface, at each layer of fill/natural soil encountered, and also at 1m intervals within the fill and within the natural substrate. In total, 137 primary soil samples were selected for a range of laboratory analysis.

Fourteen groundwater monitoring wells were installed in boreholes MW2 through MW18 down to a maximum of 15m depth. Groundwater samples were collected from the monitoring wells 5th and 6th June 2008.

The analysis suite was generally based on the chemicals of concern identified during the site history review, summarised in Section 5.

EXECUTIVE SUMMARY

The soil samples were selected for analysis on the basis of field observations and PID,measurements which targeted AECs, as well as providing lateral and vertical distribution of sampling across the investigation area.

Fourteen groundwater samples, identified as MW2 through MW4 and MW6 through MW18 were analysed for heavy metals, TPH, BTEX and VOCs. Selected samples (MW2, MW8, MW12, MW13, MW14, MW16, MW19, MW20) were also analysed for PAH and phenols. Samples from along the boundary of the Tempe landfill (MW2, MW6, MW8, MW13, MW14, MW15) along with two samples from the centre of the site (MW7, MW16) were also analysed for ammonia. A further round of sampling for ammonia was undertaken on all wells on site following the detection of elevated levels of ammonia in the first round of sampling. The analytical suite was selected based on potential chemicals of concern identified in the site history review, particularly those associated with the former service station.

Groundwater standing water levels were measured on 5th and 6th June 2008 at depths between 1.701m and 10.335m below the top of the casing. The groundwater levels appear to indicate flow in a general south easterly direction, towards the Tempe landfill.

Significant contamination was not identified within the soil samples tested. Heavy metals analysis returned results below the relevant HIL in all samples tested. Soil TPH (C_{10} – C_{36}) concentration was detected at concentrations above the investigation criteria in four samples (BH10 10.0-10.2, BH5 1.0-1.2, BH5 1.3-1.5 and MW17 1.5-1.7), but the impact appeared localised. The impact at BH10 is at depth and is most likely due to presence of hydrocarbon containing material in the landfill material (i.e. waste) identified in this location. The impact at BH5 is a localised hotspot in the shallow fill. It could be associated with a minor fuel/oil spill or historical activities undertaken at the brickworks in this location. The exceedance at MW17 coincides with the area of the tank pits and USTs at the former service station. BTEX, benzo(a)pyrene, PCBs and OCPs (Aldrin and Dieldrin) were not detected above the relevant HILs in the samples tested.

Asbestos, in the form of fibre bundles and /or fragments of fibre-cement sheeting was detected by the laboratory in two out of fifty soil samples analysed.

Heavy metal concentration in the groundwater samples were, in general, above the adopted investigation level, however it is considered the levels generally consistent with background levels expected in the local area of industrial and commercial development. TPH was detected above the LOR in two samples. There is no investigation level established for TPH in water so the LOR is adopted as the default investigation level.

Ammonia was at concentrations exceeding the investigation levels in three groundwater samples. This is considered to be due to the presence of some landfill material present in the area. The groundwater flow is in a general southerly direction, towards the Tempe landfill, which has been found to contain groundwater/leachate containing ammonia well in excess of the investigation levels.

Based on these findings, Coffey Environments considers the site can, with some limited localised remedial work, be made suitable for the proposed commercial development. The localised areas of asbestos impact would need to be excavated and removed to a suitable licensed facility. The presence of asbestos is seemingly not widespread. The shallow hotspot areas (area of former tank pits and area around BH5) could be excavated and disposed of to a suitably licensed landfill. These works require the development of a Remediation Action Plan.

1. INTRODUCTION

This report presents the findings of a Contamination Assessment undertaken by Coffey Environments Pty Limited (Coffey Environments) at a site located at 630 - 726 Princes Highway, Tempe, NSW (Figure 1).

The work was commissioned by Mr Denis Ghernisich of the Valad Property Group Ltd.

It is understood that the site is to be developed for a large commercial outlet, which comprises a large warehouse development, and that the Assessment is required to accompany the development application for the proposed development.

1.1 Objectives & Scope of Works

The objectives of the contamination assessment were:

- To identify potentially contaminating activities that are currently being performed on the site and that may have been performed on the site in the past;
- To make an assessment of potential contamination problems by undertaking sampling and testing; and
- To assess the suitability of the site for the proposed development and recommend further investigation/remediation requirements for the site to be suitable for the proposed use.
- The objectives of the investigations were addressed through the following scope of works:
- A site visit and site history review, including review of aerial photographs, title information, WorkCover records search, council information search and a search of NSW DECC records;
- Soil and Groundwater sampling;
- Laboratory testing;
- Data assessment and reporting.

2 SITE CONDITION AND SURROUNDING ENVIRONMENT

2.1 Site Identification

The site is located on the southern side of Princes Highway, Tempe NSW (Figure 1). The site consists of four different lots:

- Lot A DP 399884, including 630 Princes Highway
- Lot B in DP 399884, including 632 Princes Highway
- Lot A DP 385209 & Lot E DP 385210, including 634-726 Princes Highway.

2.2 Current Site Condition

KAS Auto

630 Princes Highway is about 0.2 ha in area and contains a mechanical workshop the eastern part, an attached office area on the western part and a canopy that extends from the main building to the front of the property. The property is bounded to the north by the Princess Highway and further on by commercial buildings and residences, to the south and east by vacant land (former Tempe landfill) and to the west by Industrial warehousing (Kennards Self Storage).

The Lot is generally flat and with the exception of planter beds along the front boundary, buildings, asphalt or concrete pavements cover the site. Based on the topography of the surrounding area, which falls away to the south east and west, it is considered that the site may have been filled. The fill would have been imported to backfill the tank and pipe excavations as well as other underground utility excavations on the site.

Kennards Storage

632 Princes Highway comprise Kennards Self Storage, a large storage facility consisting mainly of rectangular, galvanised sheeting, single and double storey buildings. Six single storey structures and 4 double storey structures were observed on site during the site visit. The lot is entirely paved by sealed surfaces in good condition. A former residential building, now used as an office by Kennards, is located in the north eastern corner of the lot. Access from Princes Highway is provided by the gates along the northern boundary. The topography of the northern part of the site gently slopes towards south east from the northern boundary to the middle of the site where a drop of approximately 3.0 m was observed. The southern half of the lot is essentially flat.

The goods stored on this site are unknown although site regulations prevent hazardous goods from being stored. It is considered that most goods are personal belongings and goods for commercial purposes. There are several areas where old vehicles (cars buses and boats) are stored. One area in the centre of the site is used for the storage of old electrical appliances comprising oven, washing machines and fridges.

Ateco

634-726 Princes Highway include sealed surfaces and garden beds. The main structure is a two storey building with an approximate rectangular shape and allocates an empty warehouse in its northern part, the “Summit Logistics” warehouse in the central part, where numerous boxes of appliances were observed, and alloy wheel and tyre storage (ground level) and Volkswagen and Audi car storage (top level) in the southern part. A sealed car park for truck loading operations is located along the north eastern boundary of this lot. A minor building, used as a car workshop, was observed in the south western corner of the lot.. The workshop also comprises a car wash facility. Three concrete lined car inspection pits were noticed in this building. A small quantity of waste engine oil (approximately 2 litres) was present in a small sump in the base of one of the pits. Two vent pipes suggesting the presence of two underground storage tanks were observed respectively in the car workshop area and below the car access ramp situated in the southern corner of the main building.

2.3 Current Surrounding Land Use

The property is bounded to the north by the Princess Highway and further on by commercial buildings and residences, to the south and east by vacant land (former Tempe landfill) and to the west by ‘Pretty Girl’ clothing warehouse.

2.4 Local Geology and Hydrogeology

2.4.1 Geology

The 1:250,000 Sydney Geological Series Sheet (Geological Survey of New South Wales, 3rd ed.1966) indicates that the site locality is underlain by Quaternary Hawkesbury sandstone characterized by alluvium, gravel, sand, silt and clay. The Hawkesbury sandstone is described as medium to coarse grained sandstone with very minor shale and laminate lenses.

Soil Landscape of The Sydney Sheet Map (Chapman et al., 2005) indicates the site is located on the Oxford Falls division of the Fluvial Landscapes group soils.

The soils in the Fluvial Landscapes group are described as hanging valleys on Hawkesbury Sandstone with occasional broad benches and broken scraps, relatively wide valley floors and often poorly drained soils, characterised by low eucalypt woodland, scrub, heathland and sedgeland.

Soils in this group generally include moderately deep to deep earthy sands, yellow earths, siliceous sands on slopes, deep leached sands, podzols and grey earths on valley floors.

Limitations in this soil group may include very high soil erosion hazard, perched water tables and swamps, highly permeable soil, very low to low soil fertility, localised rock outcrop.

2.4.2 Hydrology & Hydrogeology

The site topography is essentially flat, sloping gently towards south. Alexandria Canal is situated approximately 300m south-east of the site and the Cooks River approximately 700m south-west of the site.

Regional groundwater would be expected to be present within the sandstone bedrock beneath the site. Perched groundwater could potentially be present on top of the sandstone bedrock. The groundwater is likely to flow in the southern direction towards the canal and the river.

2.5 Acid Sulphate Soil Maps

The Australian Soil Research Information Service (A.S.R.I.S.) map (CSIRO Land and Water, 2006) was accessed to provide a preliminary indication of the risk of acid sulphate soils at the site. According to A.S.R.I.S. map, no data on acid sulphate soil is available for the site. A.S.R.I.S recommends low probability for the occurrence of Acid Sulphate Soils on site. However, possibility of potential acid sulphate soils could not be ruled out, given the site is very close to the Cooks River and the Alexandria Canal. The area immediately south and south-east of the site is indicated on the ASRIS map as characterised by low probability of acid Sulphate soil occurrence. Areas characterised by high probability of acid sulphate soil occurrence are situated between 700 and 1000m south and south-west of the site.

The site topography shows that the site occurs in the disturbed terrain that may include filled areas which often occur during reclamation of low lying swamps for urban development. Other disturbed terrain includes areas which have been mined or dredged, or have undergone heavy ground disturbance through general urban development or construction of dams or levees. Soil investigations are required to assess these areas for acid sulphate soils. A map showing the location of the site in relation to surrounding areas potentially affected by acid sulphate soils is presented in Appendix A.

3 SITE HISTORY REVIEW

3.1 Previous Reports and Investigations

3.2 Titles Information

Coffey contacted Advance Legal Search Pty Limited with the aim of identifying historical ownership details through a search of title records (Appendix B).

According to the title search findings, 630 Princes Highway is identified by Lot A in DP 399884 and is allocated in the north western corner of the site. The lot belonged to a brick maker between 1919 and 1924 and allocated a brickwork facility between 1924 and 1957. A Caltex service station occupied the lot between 1957 and 1991, when the lot was purchased by the current owners, George, Nancy and Angelo Kohilas.

The land title records for 632 Princes Highway (as shown in plan CTVol 73311 Fol 76, CTVol 6849 Fol 173, CTVol 3869 Fol 12 and CTVol 2955 Fol 129) are dated to 1919; prior to 1919 Land Title is unknown. The property was owned by Ernest Loftus Speare, a brick maker. Spear's Brick & Pipe Works Pty Limited owned the site until 1973, when it was purchased by Kalang Pty limited. From 1981 the Lot was used for self storage, as suggested by the name of the company that owned it until 1989. Wolford Limited held the Lot for a short period of time in 1989, when the site was released to Storage Equities Pty Limited, the current site owner. The land uses today remain generally unchanged, consisting of a self storage facility.

634-726 Princes Highway consists of Lot A in DP 385209 & Lot E in DP 385210. Both lots belonged to a widow from 1926 to 1940, when they were purchased by the Perpetual Trustee Company. The Lots were under the ownership of WD&WO Wells Limited from 1947 to 1954, and then belonged to Penfolds Wines Pty Limited from 1954 to 1956 and to Dalwood Vineyards Pty Limited until 1986. Penfold Management Services Pty Limited owned the Lots until 1994, when they were purchased by Southcorp Wines Asia Pty Limited. From 1995 to 2007 the Lots belonged to Ateco Automotive Pty Limited and the current owner is Valad Commercial Management Limited.

3.3 Council Records Search

3.4 Work Cover Records

A search of the Stored Chemical Information Database (SCID) for licences to keep dangerous goods at the site was conducted by the WorkCover NSW. The information disclosed by WorkCover is summarised below. Copies of the documentation provided by WorkCover are included in Appendix C.

KAS Auto

The earliest records disclosed by WorkCover for this part of the site dated back to 1957 and refer to the presence of 4,000 gallon and 3,000 gallon mineral spirit UST's. In addition, a 1,000 gallon UST is mentioned in 1961records. Renewals for the licence to keep three UST's were submitted in 1963 and 1971. From 1973 to 1976 applications for a licence to keep the above mentioned UST's and 2 LPG cylinders were submitted by Demetrios Chalkiotis, proprietor of a Caltex service station. In 1988 a renewal application was submitted for three UST's and one cylinder store and for three UST's only in 1995.

The 1995 application for licence renewal was cancelled and a note states that all tanks were removed from the site.

Kennards Self Storage

No records were located by WorkCover pertaining to this part of the site.

Ateco

Records for this part of the site start in 1958, where an application was submitted by Penfold Wines Pty Ltd for a licence to keep three 1,000 gallon mineral spirit UST's. A renewal for this licence was submitted in 1969, 1990 and 1993. A map attached to the 1993 application shows the location of three 4,500 litres petrol UST's in the south western corner of the main building, underneath the car access ramp.

A 1995 application submitted by Ateco Automotives states that one of the UST was abandoned and filled with sand/cement slurry. The vents and bowser outlets were disconnected and concrete filled.

An application for licence to keep two 4,500 litres petrol UST's was submitted in 1997 by Ateco and renewed in 2004 and 2007. A declaration signed by Ateco and dated 2008 states that dangerous goods were no longer stored at the site and that the premises were sold on 1 September 2007.

3.5 Groundwater Bore Search

A search of records held by the Department of Water and Energy revealed no licensed bores within 1km of the Site.

3.6 NSW Department of Environment and Climate Change (DECC) Records

A search of the record of NSW EPA notices revealed that various notices have been issued for an adjacent site under the Contaminated Land Management Act (NSW EPA, 1997). The site is situated in Swamp Road and lies immediately south of 632 Princes Highway. The NSW EPA documentation is shown in Appendix D and summarised below:

Table 3.2 – Summary of NSW EPA Documentation

Notice issued	Site and site address	Owner	Type of Notice	Status
25 May 00	Alexandra Canal, off Swamp rd Tempe	Sydney Water Corporation	Remediation order	Current
25 Aug 00	Alexandra Canal	Sydney Water Corporation	Declaration of remediation site	Current
27 Sept. 05	Tempe Tip Swamp rd and other lots	Marrickville Council	Site Audit Statement	Current
30 Aug 04	Tempe Tip	Marrickville Council	Site Audit Statement	Current
19 Mar 03	Tempe Tip	Marrickville Council	Note of existence of voluntary remediation	Current
26 Nov 01	Tempe Tip	Marrickville Council	Site Audit Statement	Current
25 Jul 00	Tempe Tip	Marrickville Council	Declaration of remediation site	Current
22 Mar 01	Tempe Tip	Marrickville Council	Site Audit Statement	Former

3.7 Aerial Photography Review

A selection of historical aerial photographs of the site was obtained from the Department of Lands and Conservation of NSW for the years 1951, 1961, 1970, 1986, 1991, 1994, 1998, 1999, 2002 and 2008. These photographs are presented in Appendix E. A review of historical and current aerial photographs of the site is presented in Table 3-1.

Table 3-1: Summary of Aerial Photographs

Date	On site	Offsite	Reference
1951	The south–western part of the site (currently allocating 634-726 Princes Highway) is mainly undeveloped and appears to be part of a public park or recreational area which extends in a south-west direction. This lot consists mainly of grassed areas with some trees and some unsealed access ways. A small rectangular building, with a gable roof is visible in the central area of the southern site boundary. The north eastern part of the site (currently including 632 Princes Highway) is occupied by several industrial style building, showing factory-like features. A chimney is visible in the central part of the site. The southern part of this lot seems to allocate vacant grassed soil. The northern corner of the site (630 Princes Highway) is occupied by some small building of a rectangular shape.	The area north, west and south west of the site (across the Princes highway, and south west of the site between the Princes Highway, Smith Rd and the Cooks River), is mainly occupied by medium density residential development. Vegetated open space is visible beyond the south eastern boundary of the site. The railway runs in the vicinity of the eastern site boundary and the rail terminal is visible east of Terry Street.	(unknown scale) BW, Run 16 (466-92), May 1951.
1961	The southern lot has been developed. The rectangular building along the southern boundary appears unchanged. The lot seems to allocate a warehouse style building, approximately rectangular in shape, elongated in a north south direction, surrounded by grassed area and access ways. The sign PENFOLDS WINES is clearly visible on the roof. An access ramp is visible in the south eastern corner of the building. A smaller industrial looking building is visible in the south eastern corner of the site and some trees are visible along	The site immediately south west of the site has been developed into a large industrial-like structure. The rest of the surrounding area appears substantially unchanged in comparison to the 1951 photograph.	(unknown scale) BW, Run 38E (1042-5181), Cumberland 1961 Series.

Date	On site	Offsite	Reference
	the access ways. The northern lots appear substantially unchanged, with the exception of a minor structure in the northern corner of the site. The exact nature of this structure could not be identified.		
1970	The main features of the south western lot appear unchanged in comparison to the 1961 photograph. The open space in the southern part of 632 Princes Highway seems to be now used as a quarry. The rest of the site appears substantially unchanged in comparison to the 1961 photograph.	The surrounding area appears substantially unchanged in comparison to the 1961 photograph.	(unknown scale) BW, Run 19 (1909-5010), 7 July 1970.
1978	The main features of the south western lot appear unchanged in comparison with the 1970 photograph. The lot currently occupied by 632 Princes Highway appears to have been cleared or in the early stages of a redevelopment. The conditions of northern lot are difficult to assess given the low definition of the photograph.		(1:16000) BW, Run 18 (2713-153), 6 May 1978.
1986	The main features of the south western lot appear unchanged. The eastern lot has been entirely paved and a number of long rectangular industrial buildings have been erected across the entire lot area. Five of them are parallel to the Princes Highway, elongated in an east to west direction. One is situated along the boundary between the two lots. The remaining three are situated in the southern portion	The residential development south east of the site appears substantially unchanged. The vegetated area surrounding the south western boundary of the site has been cleared and it now appears to be used as a quarry. The north eastern portion of the park south of the site appears to allocate a concrete/asphalt paved storage area, where several containers are visible. The railway and its related	(1:16000) Colour, Run 24E (3527-112), 2 August 1986.

Date	On site	Offsite	Reference
	of the site, stretched in a north-south direction. Several minor structures are visible in the far north eastern corner of the site. The northern corner of the site appears to have been redeveloped into three main building with a industrial or commercial appearance.	structures and the surrounding urban development appear substantially unchanged.	
1991	The site appears substantially unchanged in comparison with the 1986 photograph.	The surrounding area appears substantially unchanged in comparison to the 1986 photograph. The north western part of the quarry situated immediately south of the site has been paved, a number of containers have been stored in this area and a warehouse style building has replaced several smaller buildings in the north eastern corner of the quarry. Sydney Airport is now visible south of the Alexandria Canal.	(1:25000) Colour, Run 12 (3527), 13 August 1991
1994	The site appears substantially unchanged in comparison with the 1991 photograph.	The surrounding area appears substantially unchanged in comparison to the 1991 photograph. The containers have been removed from the paved area south of the site. The unpaved area of the quarry appears to have been revegetated. This may indicate a change in the site land use.	(1:25000) Colour, Run 12 (95-107), 4 October 1994.
1998	The site appears unchanged in comparison with the 1994 photograph. A car park has been built along the south western boundary of the site.	The surrounding area appears substantially unchanged in comparison to the 1994 photograph. The paved area adjacent to the south boundary of the site appears entirely occupied by stored containers.	(1:25000) Colour, Run 12 (91-104), 29 September 1998.
1999	The site appears unchanged in comparison with the 1998 photograph. A second car park	The surrounding area appears substantially unchanged in comparison to the 1998	(1:20000) Colour, Run 7 (113-125), 4 May 1999.

Date	On site	Offsite	Reference
	has replaced the garden bed in the western lot, along the northern boundary.	photograph.	
2002	The site appears unchanged in comparison with the 2002 photograph. The paved car parks in the western lot have been replaced by garden beds.	The surrounding area appears substantially unchanged in comparison to the 1999 photograph.	(1:25000) Colour, Run 12 (37-49), 16 March 2002
2008	The site appears substantially unchanged in comparison to the 2002 photograph.	The surrounding area appears substantially unchanged in comparison to the 2002 photograph. The area south of the site is now occupied by the Tempe Tip landfill.	Google Image

In summary, the aerial photographs indicate the three lots of the site were developed in different stages. The south western lot was developed between 1951 and 1961. The early development of this part of the site appeared to show the current features, including a rectangular warehouse style building and some smaller structures, and has not experienced major changes since. The central lot of the site was already developed into an industrial plant in 1951 and was redeveloped between 1978 and 1986. Similarly to the western lot, the features of the eastern lot have not experienced major changes since their redevelopment. The main buildings in this part of the site included a number of narrow rectangular buildings distributed across the entire lot area. The structures present on the northern corner of the site in 1951 were demolished and redeveloped between 1970 and 1986.

The surrounding area showed a number of industrial and residential dwellings already in 1978. The railway was developed before 1951. The site immediately south of 632 Princes Highway was undeveloped until at least 1978 and was developed into a quarry between 1978 and 1986. The quarry was disused between 1986 and 1994, when it appeared covered by vegetation. The area is currently occupied by the Tempe Tip landfill.

3.8 Summary of Site History and Walk Over

KAS Auto

The Lot appeared to be already developed prior to 1951 and, according to the title search documentation, belonged to a brick maker. This suggests it was part of the brickworks facility located in the lot adjacent to the south western boundary.

A Caltex service station was erected in the northern corner of this lot between 1951 and 1961 and redeveloped into an automotive workshop, the current land use, between 1978 and 1986.

WorkCover records confirmed the presence of UST's at the site between at least 1957 and 1995.

Kennards Self Storage

The lot was used for industrial purposes since prior to 1951. According to the Land Title documentation, it allocated a brickwork facility with a quarry in the southern part until at least 1973. This lot was redeveloped into a storage facility between 1978 and 1986. The site is currently used as a storage facility. According to WorkCover records, no dangerous goods were stored at the site.

Ateco

The south-western part of the site consisted mainly of grassed areas and garden beds in 1951, when according to the Land Title documentation belonged to private owners. In 1954 Penfolds Wines Pty Ltd purchased this part of the site and an industrial style building was erected between 1951 and 1961.

The site features remained substantially unchanged since 1961, while an automotive company took ownership of the site in 1995 and Valad Commercial management limited, the current owner, purchased the lots in 2007. Different areas of the main building are currently used for different purposes, as revealed by the site walkover, including tyre storage, warehouse and car storage. The smaller building in the southern corner of this part of the site is currently used by a car workshop.

WorkCover records revealed that a number of UST's have been kept in the depot situated in the south west corner of the main building since 1958. Filling points were located in the automotive area of the lot. According to a declaration signed by the site owner, dangerous goods were no longer stored in this part of the site in 2008.

A possible vent pipe was located on the eastern wall of the Ateco building in the loading yard area. It is possible that this could be linked to an underground storage tank. No other infrastructure associated with an underground tank was seen and no records of a tank in that location were revealed in the WorkCover search.

3.9 Gaps in Site History

The nature of the activity undertaken at 630 and 632Princes Highway prior to 1919 is unknown.

The nature of the activity undertaken at 634-726 Princes Highway prior to 1926 is unknown.

The exact nature of the activities undertaken by the wine company (storage, production, distribution or other) located in Lot A in DP 385209 is unknown.

Potential Areas of environmental concern

Based on the site history review, potential areas of environmental concern (AECs) and associated chemicals of concern were identified. These are summarised in Table 4.1.

Table 4.1: Summary of Potential Areas and Chemicals of Concern

Potential AECs	Description of potentially contaminating activity	CoCs*	Likelihood of Contamination (Based on Site History Study Only)**	Comments
All Lots	Importation of Contaminated Fill	Metals***, TPH, BTEX, PAHs, PCBs, OCPs, OPPs, asbestos, acid sulphate soils	Moderate	Imported fill material could have been used on site to level the ground for the erection of structures. The source and contamination status of the fill is not known.
Lot A DP 399884	Former service station	PAH, TPH, BTEX, Heavy Metals***	High	The site was owned by Caltex oil Pty Limited between 1957 and 1991. According to WorkCover records, a number of UST's were located on site between 1957 and 1995.
	Mechanics workshop	Heavy metals, PAH, Asbestos	High	A mechanic workshop is located in the southern part of this lot. Oil spills and leaks from machinery or vehicles in this part of the site may have penetrated the shallow layers of soil.
	Former brickworks activities	Heavy metals, PAH, Asbestos	High	Former brickworks activities conducted on site until 1957 are a potential source of contaminations.

Potential AECs	Description of potentially contaminating activity	CoCs*	Likelihood of Contamination (Based on Site History Study Only)**	Comments
	Demolition of former buildings Weathering and leaching of hazardous material potentially present within former structures	Asbestos, lead, PCB	Moderate	Parts of the buildings in this part of the site were demolished and/or redeveloped between 1978 and 1986. Hazardous material, including asbestos cement sheeting and lead based paint, may have been introduced to the site during the demolition works or as a result of leaching or weathering while the buildings were standing on-site.
Lot B DP 399884	Former brickworks activities	Heavy metals, PAH, Asbestos	High	Former brickworks activities conducted on site until at least 1970 are a potential source of contamination.
	Importation of contaminated fill	Heavy Metals***, TPH, BTEX, PAHs, PCBs, OCPs, OPPs, asbestos, acid sulphate soils	High	The southern part of the lot was used as a quarry between 1961 and 1978. Fill material may have been used on site to fill up the quarry area and level the site.
	Demolition of former buildings Weathering and leaching of hazardous material potentially present within former structures	Asbestos, lead, PCB	Moderate	Hazardous material, including asbestos cement sheeting and lead based paint, may have introduced to the site during the demolition works conducted on site between 1970 and 1978 or as a result of leaching or weathering while the buildings were standing on-site.

Potential AECs	Description of potentially contaminating activity	CoCs*	Likelihood of Contamination (Based on Site History Study Only)**	Comments
Lot A DP 385209 and Lot E DP 385210	Oil spills and leaks within the car workshop area	PAH, TPH, BTEX, Heavy Metals***	High	The site walkover revealed the presence of a car workshop in the southern corner of the lot. Engine oil in the form of free product was observed at the bottom of three car inspection pits.
	Leaks and spills from the two UST's	PAH, TPH, BTEX, Heavy Metals***	High	Two underground storage tanks were observed on site during the site walk over in the vicinity of the car workshop building. WorkCover records revealed that 3 UST's were located on site between 1958 and 1995, when one tank was disused and filled with cement.
	Maintenance of grassed areas and gardens	OCP, OPP, PBC	Moderate	Herbicides and pesticides may have been used on this part of the site since at least 1951, when the lots consisted mainly of grassed areas and garden beds.
	Oil leaks from vehicles used and parked on the site	PAH, TPH, BTEX, Heavy Metals***	Low	Car parks and vehicles are visible on site in some historical aerial photographs. Several trucks were observed on site during the site walkover. A Volkswagen and Audi car storage area is located in the southern part of the top level of the main building. Fuel or oil may have leaked from the vehicles and penetrated into the shallow layers of soil in localised parts of the site.

-This is not an assessment of the financial risk associated with the AEC in the event contamination is detected, but a qualitative assessment of the probability of contamination being detected at the potential AEC based on the site history study.

**CoC - Chemicals of Concern*

*** It is important to note that this is not an assessment of the financial risk associated with the AEC in the event contamination is detected, but a qualitative assessment of the probability of contamination being detected at the potential AEC based on the site history study.*

****Metals - Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc*

BTEX - Benzene, Toluene, Ethylbenzene and Xylenes

TPH - Total Petroleum Hydrocarbons

PAH - Polycyclic Aromatic Hydrocarbons

OCP - Organochlorine Pesticides

OPP – Organophosphorus Pesticides

PCB – Polychlorinated Biphenyls

4 REGULATORY BACKGROUND AND APPLICABLE GUIDELINES

4.1 Soil Investigation Criteria

The investigation criteria for soil were established based on the following references:

- NSW DEC (2006) Guidelines for the NSW Auditor Scheme (Second Edition);
- NSW EPA (1994) Guidelines for Assessing Service Station Sites; and
- NEPC (1999) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM).

Other references were used to supplement the above, where appropriate.

The NSW DEC (2006) Guidelines for the NSW Site Auditor Scheme and the NEPM present health based investigation levels for different land-uses (e.g. industrial / commercial, residential, recreational etc.) as well as provisional phytotoxicity based investigation levels.

The site is proposed to be developed as a large retail development with associated car parking which is considered to be consistent with a commercial land-use. Consequently the human health based soil investigation levels (HILs) for commercial and industrial land-use, provided in Column 4 of Appendix II in the NSW DEC (2006) Guidelines for the NSW Site Auditor Scheme (Second Edition) have been adopted as the soil investigation levels. Phytotoxicity does not need to be considered for commercial / industrial land-use.

NSW EPA (2006) Guidelines do not provide threshold levels for volatile petroleum hydrocarbon compounds. NSW EPA (1994) Guidelines for Assessing Service Station Sites provide an indication of acceptable cleanup levels for petroleum hydrocarbons compounds at service station sites to be reused for sensitive land-uses. The EPA has advised that these guidelines should also be used for less sensitive land-uses. For semi-volatile petroleum hydrocarbons (C16 – C35 and >C35) investigation levels are provided in the NSW EPA (2006) Guidelines, however, these are based on the NEPM health-based criteria, which require the laboratory analysis to unequivocally differentiate between aromatic and aliphatic compounds. If this cannot be done, the C10 – C40 criteria in the service station guidelines should be applied. For this investigation, we have adopted the service station guidelines for all petroleum hydrocarbon fractions.

There are currently no national or DEC-endorsed guidelines relating to human health of environmental investigation of material containing asbestos on sites. NSW DEC (2006) advise that until such guidelines become available, auditors must exercise their professional judgement when assessing if a site is suitable for a specific use in the light of evidence that asbestos may be a contaminant of concern. NSW DEC (2006) states that NSW Health will provide advice to auditors on a case-by-case basis, where appropriate. The NSW DEC previously provided interim advice that “no asbestos in the soil at the surface is permitted”. Enhealth (2005) ‘Guidelines for Asbestos in the Non-Occupational Environment’, provides some guidance on assessing and managing asbestos in soil although does not provide a threshold concentration or investigation level for asbestos. Coffey Environments has adopted an asbestos investigation level of “non-detect” for this site.

The adopted soil investigation levels are included in Table LR1.

4.2 Groundwater Investigation Criteria

4.2.1 Potential Beneficial Uses

For assessing groundwater quality, it is necessary to assess the beneficial uses of groundwater down-gradient of the site being assessed.

During the Site History Review, a search for borehole records was carried out by the Department of Water and Energy under the request of Coffey Environments. The search did not reveal any borehole records within a 1km radius of the site.

Considering the site is adjacent to the Tempe landfill, groundwater is not considered to be a viable source for potable use.

Alexandria Canal is situated approximately 300m south-east of the site and the Cooks River approximately 700m south-west of the site.

It is considered that groundwater from the site would eventually discharge into these surface water bodies either directly or through a storm water channel. These water bodies would support freshwater aquatic ecosystems and could potentially be used for recreational water use.

On this basis potential environmental values of groundwater are considered to include:

- Protection of freshwater aquatic ecosystems; and
- Recreational water use.

4.2.2 Protection of Aquatic Ecosystems

The investigation levels presented in the ANZECC (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality are considered applicable for the protection of ecosystems of the receiving waters. As these guidelines apply to receiving waters, it is generally conservative to apply these to groundwater discharging to receiving waters.

ANZECC (2000) advocates a site-specific approach to developing guideline trigger values based on such factors as local biological affects data, the current level of disturbance of the ecosystem etc. The guidelines present 'low risk guidelines trigger values' which are defined as concentrations of key performance parameters below which there is a low risk that adverse biological effects will occur. It is important to note that these are not threshold values at which an environmental problem is likely to occur if exceeded. Rather, if the trigger values are exceeded, then further action is required which may include either further site-specific investigations to assess whether or not there is an actual problem or management / remedial action.

Low risk trigger values are provided for the protection of 80-99% of species in marine (presented in Table 3.4.1 of the guidelines), with the trigger value depending on the health of the receiving waters.

It is understood that the DECC's policy is that the trigger values for the protection of 95% of aquatic ecosystems should be used except where contaminants are potentially bio-accumulative in which case the trigger values for protection of 99% of species should be used. Therefore, we have selected trigger values for protection of 95% of fresh water species for the majority of contaminants, and 99% of fresh water species for bio-accumulative contaminants for initial comparison purposes.