



Maryland Development Company Pty Ltd  
Contamination Management Plan

Central Precinct and Dunheved Precinct,  
Llandilo NSW

24 January 2018  
43352/61064 (Rev 3)  
JBS&G

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## List of Abbreviations

A list of the common abbreviations used throughout this report is provided below. Additional development site specific terminology is discussed in **Section 1**.

ACM	Asbestos Containing Material
AHD	Australian Height Datum
As	Arsenic
Cd	Cadmium
Cr	Chromium
Cu	Copper
CSM	Conceptual site model
BTEX	Benzene, toluene, ethylbenzene and xylenes
B(a)P	Benzo(a)pyrene
DEC	NSW Department of Environment and Conservation
DECCW	NSW Department of Environment, Climate Change and Water
DQI	Data quality indicator
DQOs	Data Quality Objectives
DWE	NSW Department of Water and Energy
EPA	NSW Environment Protection Authority
ha	Hectare
Hg	Mercury
HIL	Health based investigation level
JBS&G	JBS&G Australia Pty Ltd
LOR	Limit of Reporting
Ni	Nickel
OCP	Organochlorine Pesticides
OEH	Office of Environment and Heritage
PAHs	Polycyclic aromatic hydrocarbons
Pb	Lead
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RPD	Relative Percentage Difference
SAQP	Sampling, Analysis and Quality Plan
TPH	Total Petroleum Hydrocarbons
VOC	Volatile Organic Compound
Zn	Zinc

# 1. Introduction

## 1.1 Background

JBS&G Australia Pty Ltd (JBS&G) was engaged by Maryland Development Company Pty Ltd (the client, MDC) to revise the Contaminant Management Plan (CMP) for the Central Precinct Development and associated Regional Park site, located at Llandilo, NSW ('Central Precinct'). The Central Precinct is the third residential development area located within the former ADI St Marys property ('the property') (**Figure 1**). The Central Precinct is within part Lot 1003, DP1215087, (it is noted that the lot DPs have changed recently due to subdivision within the southern portion of the site).

It is understood the Central Precinct is to be developed for residential land use and remedial works will involve relocation of materials unsuitable for residential use but suitable for commercial/industrial to the Dunheved Industrial Precinct (Dunheved) located within the property. The location of Dunheved is shown on **Figure 1**.

This CMP has been updated for the remediation phase of works which includes the Dunheved Industrial Precinct and updated details regarding the principal contractor conducting the works. The objectives of the CMP, including the roles and responsibilities of various parties, remain the same for the updated plan.

The former Australian Defence Industries (ADI) Property at St Marys was endorsed by the NSW Government for inclusion on the Urban Development Program in 1993. The Property was seen to present an opportunity to provide housing for Sydney's growing population within an environmentally sustainable framework.

The Property is located approximately 45km west of the Sydney CBD, 5km north-east of the Penrith City Centre and 12km west of the Blacktown City Centre. The main western railway is located approximately 2.5km south of the Property. The Great Western Highway is located another 1 km south and the M4 Motorway a further 1.5km south.

The Property has an area of 1,545ha, and stretches roughly 7 kilometres from east to west and nearly 3 kilometres from north to south, from Forrester Road, St Marys in the east to The Northern Road, Cranebrook in the west, and is bounded by Llandilo and Willmot in the north and Cambridge Gardens/ Werrington County and the Dunheved Industrial Area in the south.

Given that the Property straddles the boundary between two local government areas (Blacktown and Penrith), the NSW Government decided that a regional environmental plan should be prepared covering development of the Property. Technical investigations into the environmental values and development capability of the land were commenced in 1994, and the Regional Environmental Plan for St Marys (Sydney Regional Environmental Plan No. 30 (SREP 30)) was gazetted in January, 2001. SREP 30 zoned the land for a combination of "urban", "employment", "regional open space", and "regional park" uses.

A package of documents was prepared to guide and control development comprising SREP 30 (maps and a written instrument) and an Environmental Planning Strategy (EPS) which sets out performance objectives and strategies to address key constraints associated with the Property, including: conservation, cultural heritage, water and soils, transport, urban form, energy and waste, human services, employment and land contamination.

In December 2002, a Deed of Agreement was entered into between the landowner and developers of the land (a Joint Venture comprising ComLand and Lend Lease Development) and the NSW Government setting out the developer's and State Government's responsibilities in providing services and infrastructure.

SREP 30 identified six development “precincts” (known as the Western Precinct, Central Precinct, North and South Dunheved Precincts, Ropes Creek Precinct and Eastern Precinct) within the Property.

SREP 30 requires that a Precinct Plan, addressing the issues in SREP 30 and the EPS (including preparation of management plans for a range of key issues), be adopted by Council prior to any development taking place.

In March 2002, the Commonwealth Government advised those areas of the Property listed on the Register of the National Estate should be excluded from urban development. This had the effect of changing the boundaries of the areas to be set aside for conservation.

Central Precinct and the Dunheved Industrial Precinct (north and south), the subject of this CMP, occupies a combined area of approximately 160 hectares (**Figures 1 and 2**). Central Precinct and Dunheved has already been the subject of extensive investigation and remediation since the 1990s. The investigation and remediation work was undertaken with the full involvement of the EPA and subsequently an independent NSW EPA accredited Site Auditor who produced and issued Site Audit Statements for the whole of the St Marys Property (Stage 2 Decontamination Audit of ADI St Marys Munitions Factory, dated 7 June 1999).

The investigation and remediation programme for the Property commenced in 1990, with the objective of assessing the nature, degree of munition and chemical contamination and remediating to a level suitable for redevelopment for a variety of land uses including residential. For the purposes of the remediation and validation, the Property was divided into nine sectors. The Central Precinct covers part of the following sectors as follows:

- Southern West Sector: Covered by Site Audit Statements (SASs) CHK001/1 and CHK001/6;
- Southern Sector East: Covered by Site Audit Statement (SASs) CHK001/1;
- Central West Sector: Covered by SASs CHK001/1, CHK001/5, CHK001/6 and CHK001/7; and
- North Western Sector: Covered by SASs CHK001/1, CHK001/4, CHK001/6 and CHK001/7.

The CMP is a condition of all SASs requiring an appropriate management plan including procedures for the safe handling and disposal of any items of explosive ordnance, shall be in place before development earthworks commences and shall remain in place to cover any excavation on within Central Precinct during its ongoing use.

The information presented in the remediation and validation reports for these sectors has been considered, along with other relevant information for the Property, to develop this CMP (Central Precinct).

The majority of the Central Precinct was assessed by the Site Auditor to pose a negligible risk to the public or the environment with regard to chemical contamination and/or explosive ordnance (See SASs as listed above in **Appendix A**). Conditions on the SASs required investigation and assessment of areas underlying roadways and stockpiles which has been recently been completed in accordance with the JBS&G Sampling Analysis and quality Plan (SAQP) (JBS&G 2017a<sup>1</sup>).

## 1.2 Objectives

The objectives of this CMP is to provide an Unexpected Finds Protocol (UFP) with an appropriate framework for identifying and addressing any discovery of chemical contamination, potentially explosive ordnance or any other form of hazard during development prior to subdivision so as to

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<sup>1</sup> *Sampling Analysis and Quality Plan, Central Precinct, Ropes Crossing NSW, Maryland Development Company Pty Ltd, JBS&G, December 2017 Rev 5 (JBS&G 2017a).*



ensure a safe working environment for workers and to avoid unacceptable impact on the natural environment.

Unexpected finds may occur in areas which, although searched extensively, contain remnant materials which were obscured by the local topography, the type of surface cover (e.g. building) or at a depth preventing detection. The Site Auditor<sup>2</sup> considered that, while explosive ordnance may be uncovered during earthworks, it is unlikely that these will present an unacceptable risk provided appropriate procedures for the safe handling and disposal of such material are adopted.

Furthermore the CMP provides an appropriate framework for an Asbestos Management Plan (AMP) including procedures required for handling and disposing of any identified asbestos containing materials and asbestos impacted soils during the development and/or remediation of the Central Precinct. A specific AMP has been prepared under **Section 3** below.

The successful implementation of the CMP requires the appropriate briefing and Specific OHS Induction of site workers who may uncover potential chemical contamination (including potential asbestos containing materials) and/or explosive ordnance. It is proposed this briefing will include the review of this CMP and the associated flow chart (**Appendix B**).

This CMP describes reporting procedures and lines of responsibility, including the contact numbers for relevant experts at the commencement of the development works (See **Section 1.3**). These experts should include those with detailed knowledge of the remediation which has been undertaken at the Property and details on the location of, and access to, the supporting documents related to the assessment and remediation of the Central Precinct.

The Property has been remediated, audited and declared suitable for its intended land uses, and remnant contamination, if present, is most likely to be discovered during the development earthworks which occur prior to subdivision. The approaches included in this CMP are intended for use only during the Central Precinct preparation phase of development, during which structures are demolished and disposed of, land levels are altered and redundant infrastructure is removed and new infrastructure is installed. Post-subdivision management plans, if required, would be administered through the relevant local government authority.

### 1.3 Terminology and Roles and Responsibilities

Provided in the tables below are the terminology and roles and responsibilities relevant to the Central Precinct.

**Table 1.1: Terminology**

Abbreviation	Term	Definition
ACM Bonded	Asbestos Containing Materials Bonded	Bonded ACM comprises ACM which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin. This term is restricted to material that cannot pass a 7 mm x 7mm sieve. Equivalent to “non-friable” asbestos in <i>How to Manage and control asbestos in the workplace Code of Practice</i> (Safe Work Australia 2011).
AF	Asbestos Fines	AF includes free fibres, small fibre bundles and also small fragments of bonded ACM that pass through a 7 mm x 7mm sieve. Equivalent to “friable” asbestos in <i>How to Manage and control asbestos in the workplace Code of Practice</i> (Safe Work Australia 2011).
Ammunition	Ammunition	A device charged with explosives, propellants, pyrotechnics, initiating composition, or nuclear, biological or chemical material for use in connection with defence or offence

<sup>2</sup> Stage 2 Decontamination Audit of ADI St Marys Munitions Factory (HLA, 1999)

Abbreviation	Term	Definition
		including demolitions. Certain ammunition can be used for training, ceremonial or other non-operational purposes.
AMP	Asbestos Management Plan	See <b>Section 3</b>
AOC	Area of Concern	An area identified as containing potential contamination. Also referred to as Quarantined Area.
Category A	Category A ordnance Item	An item clearly of a military nature and which might readily be recognised by a member of the public as such (e.g. in effect complete in appearance as a projectile of 20 mm calibre or greater, hand grenade, mortar, bomb, etc.) and <u>containing explosive filling</u> , but excluding small arms ammunition.
Category B	Category B Ordnance Item	An item clearly of a military nature and which might readily be recognised by a member of the public as such (e.g. in effect complete in appearance as a projectile of 20 mm calibre or greater, hand grenade, mortar, bomb, etc.) and <u>not containing explosive filling</u> , but excluding small arms ammunition.
Central Precinct	Central Precinct	The development site as shown on <b>Figure 1 and 2</b> .
CMP	Contamination Management Plan	This plan. This is a revision of the previous CMP (URS 2008 <sup>3</sup> ).
Dunheved	Dunheved Industrial Precinct	The Dunheved Industrial Precinct within the property as shown on <b>Figure 1</b> .
DUXOP	Defence Unexploded Ordnance Panel	The panel of contractors and consultants from whom the Department of Defence selects remembers for UXO related tasks.
FA	Fibrous Asbestos	FA comprises friable asbestos material and includes severely weather cement sheet, insulation products and woven asbestos material. Defined as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. Equivalent to “friable” asbestos in <i>How to Manage and control asbestos in the workplace Code of Practice</i> (Safe Work Australia 2011).
Induction	Site Specific Induction	The <i>Work Health and Safety Act 2011</i> (WHS Act) main objective is to secure the health and safety of workers and workplaces. A site specific induction is necessary for all workers on the Central Precinct to understand the site specific risks.
Metallic Debris	Metallic Debris	Debris comprising metal (ferrous) items. May include fragments of former ordnance items.
Ordnance	Ordnance	Any item of potential military origin. See Ammunition, Category A and B Ordnance Item and UXO
Property	Former St Marys ADI Property	The whole of the landholding formerly known as the ADI St Marys Property as shown on <b>Figure 1</b> .
Quarantined Area	Quarantined Area	Area removed from development activities due to potential contamination. Also see AOC.
Site	Site	The subject area, where potential contamination has been found.
UXO	Unexploded Ordnance	Explosive ordnance that has been primed, fused, armed or otherwise prepared for action and which has been fired, dropped, launched, projected or placed in such a manner as to constitute a hazard to operations, installations, personnel or material but remains unexploded either by malfunction or design or for any cause. UXO includes items of military ammunition or explosives removed from their original resting place for any reason, including souveniring.

<sup>3</sup> Contamination Management Plan Central Precinct Development Phase, URS Australia Pty Ltd, 7 July 2008 (URS 2008).

**Table 1.2: Roles and Responsibilities**

Responsibility	Role and Company (where available)
Client	Maryland Development Company (MDC). The owner of the Central Precinct. Responsible for the overall management of the Central Precinct and the engagement of the Principal Contractor and Environmental Consultant.
Principal Contractor	Liberty Industrial (Liberty) – Mitch Broughton 0408 750 090 ----- Means the contractor in primary control of the Central Precinct, or site. Responsible for notifying the client, appropriate consultant or contractor in relation to unexpected finds. Also responsible for quarantining AOC with suitable barricades and informing other workers of its location.
Site Auditor	Zoic Environmental - Kylie Lloyd ----- Responsible for review of works conducted by the environmental consultant at the site and ultimately provides Site Audit Statements following completion of assessment and remediation works.
Environmental Consultant	JBS&G – George Black 0400 300 552 Katie Linz – 0422 913 638 Rob Sharp – 0435 152 557 Samuel Heaton – 0433 148 010 ----- As defined under the NEPM (NEPC 2013) (Schedule B9) the environmental consultant responsible for the assessment of contaminated sites and preparation of assessment reports should be able to demonstrate relevant qualifications and experience to a level appropriate to the contamination issues relevant to the site under investigation. ----- Responsible for notifying the Client and Principal Contractor of any unexpected finds. Also responsible for undertaking the assessment, remediation and validation of any AOC in relation to chemical contamination. Additionally responsible for engaging the Ordnance contractor.
Ordnance Contractor	Persons and/or company appropriately qualified to undertake ordnance searches, clearances and prepare reports. Responsible for undertaking ordnance searches, removal of items and clearances.
Licenced Asbestos Assessor	JBS&G – Michael Samuel/George Black 02 8245 0300 ----- Means a person who holds an asbestos assessor licence. Responsible for final clearances after asbestos removal works are undertaken.
Licensed asbestos removalist (Asbestos Removal Contractor)	Means a person conducting a business or undertaking who is licensed under the WHS regulation to carry out Class A or Class B asbestos removal work. Responsible for the safe removal of asbestos of any AOC in accordance with the relevant legislation and codes of practice.
Asbestos Consultant / Competent Person	A person who has acquired through training or experience the knowledge and skills of relevant asbestos removal industry practice and holds a certification in relation to the specified VET course for asbestos assessor work or a tertiary qualification in occupational health and safety, occupational hygiene, science, building, construction or environmental health. For all other purposes, competent person means a person who has acquired through training, qualification or experience, the knowledge and skills to carry out the task.
Worker	Any worker on the Central Precinct development site, including any contractor or sub-contractor. Responsible for undertaking their tasks in a safe manner and notifying the Principal Contractor if they see any items/conditions which may constitute and unexpected find.

## 2. Unexpected Finds Protocol

The Central Precinct has previously been the subject of number of environmental investigations. Detailed site history is provided in the SAQP (JBS&G 2017a). However, given the size of the Central Precinct, there is potential for the presence of unexpected finds of contamination during bulk excavation. The unexpected Finds Protocol (UFP) is summarised in **Appendix B** and is detailed in the following sections.

The objective of the UFP is to provide clear guidance on the safe and appropriate actions in the event of encountering potential chemical or ordnance contamination during development works. Where such material is uncovered the UFP prescribes the quarantining of the relevant area of concern, allowing other works to proceed unhindered, while the area of concern is assessed and, if necessary, remediated and validated.

Areas of Concern (AOC) may be identified by the Principal Contractor, Environmental Consultant or a site worker. The AOC will be quarantined by the Principal Contractor by means of some appropriate barrier to prevent access to the area. The quarantined area/s will be communicated with workers during the daily tool box talks.

Two classes of potential contamination are discussed separately below: chemical (including potential asbestos containing materials) and ordnance.

### 2.1 Potential Chemical Contamination

#### 2.1.1 State the Problem

It is acknowledged that previous investigations of the development site have been undertaken to assess contaminants of potential concern. However, ground conditions between sampling points may vary, and further hazards may arise from unexpected sources and/or in unexpected locations during redevelopment. The nature of any residual hazards which may be present at the Central Precinct are generally detectable through visual or olfactory means, for example:

- Potentially asbestos containing sheeting, fragments or insulation materials (visible);
- Discoloured / Odorous soils (visible and odorous);
- Drums / bottles / containers of chemicals (visible);
- Construction / demolition waste (visible);
- Ash and/or slag contaminated soils / fill materials (visible);
- Petroleum contaminated soils (staining / discolouration visible);
- Volatile organic compound contaminated soils (odorous);
- Asphalt contaminated fill (visual); or
- Uncovering in-ground infrastructure (e.g. underground storage tanks, USTs).

As a precautionary measure to ensure the protection of the workforce and surrounding community, should any of the abovementioned substances be identified (or any other unexpected potentially hazardous substance), the procedure summarised in **Appendix B** and detailed in the following sections is to be followed.

An enlarged version of the unexpected finds protocol, suitable for use on site, should be posted in the Site Office and referred to during the Site Specific Induction by the Principal Contractor.

If the Principal Contractor considers material to be potential chemical contamination the area will be quarantined and a suitably qualified Environmental Consultant will be contacted. The

Environmental Consultant will be responsible for assessing the findings, taking samples to characterise and delineate the extent of the potential contamination and defining appropriate remedial actions, if required, in accordance with **Section 2.1.2 to 2.1.14**.

Suspected asbestos containing materials should be assessed in accordance with **Section 2.1.2 to 2.1.14** and managed in accordance with relevant WorkCover requirements and the asbestos management plan (AMP) detailed in **Section 3**.

Where contamination is identified (**Section 2.1.15**) within any AOC by the Environmental Consultant it will be managed, validated and reported in accordance with the Specific Remedial Strategy (SRAP) (JBS&G 2017b<sup>4</sup>) for the Precinct.

If the area is determined by the Environmental Consultant to not be contaminated or the analyses meet the relevant site criteria (SRAP), the Environmental Consultant should notify the Principal Contractor that the quarantine restrictions on the area can be lifted and the works in that area may resume. The Environmental Consultant will prepare a report on the investigation and the conclusions drawn.

### **2.1.2 Identify the Decision**

Based on the decision making process for assessing urban redevelopment site detailed in EPA (2017<sup>5</sup>), modified to meet the specific project objectives, the following decisions must be made during any unexpected find assessment:

- Are there any unacceptable risks to likely future onsite receptors from impacted soils during development?
- Are there any issues relating to local area background soil concentrations that exceed the appropriate soil criteria?
- Are there any impacts of chemical mixtures?
- Are there any aesthetic concerns in fill soils present at the site?
- Are there any items of UXO present at the site?
- Is there any evidence of, or potential for, migration of contaminants off-site?
- Is the site specific risk assessment required to be updated?
- Is a site management strategy required?

### **2.1.3 Identify Inputs to the Decision**

Inputs to the decisions are:

- Environmental data, and or UXO survey data as collected by sampling and analysis and site observations made during this investigation;
- Assessment criteria to be achieved on the site as based on the intended landuse and project objectives, as defined by assessment criteria nominated in Section 8 of the SAQP (JBS&G 2017a);
- Final site surface survey; and

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<sup>4</sup> *Specific Remedial Action Plan - Central Precinct Llandilo, NSW*, JBS&G Australia Pty Ltd, 24 August 2017 Rev 5 (JBS&G 2017b).

<sup>5</sup> *Contaminated Land Management – Guidelines for the NSW Site Auditor Scheme (3<sup>rd</sup> Edition)* October 2017 (EPA 2017)

- Confirmation that data generated by sampling and analysis are of an acceptable quality to allow reliable comparison to assessment criteria as undertaken by assessment of quality assurance / quality control (QA/QC) as per the data quality indicators (DQIs) established in **Section 2.1.6**.

#### 2.1.4 Define the Study Boundaries

Each AOC identified and investigated and where required, remediated, will be surveyed to provide accurate boundaries.

The vertical extent of soil investigation will be 0.3 m into natural soils. For groundwater the vertical extent of the investigation will extend to the shallowest depth/aquifer that groundwater is encountered.

Data will be representative of the timing and duration of each investigation.

#### 2.1.5 Develop a Decision Rule

Laboratory analytical data will be assessed against EPA endorsed criteria as identified in **Section 8** of the SAQP (JBS&G 2017a) and in the SRAP (JBS&G 2017b).

The decision rules adopted to answer the decisions identified in **Section 2.1.2** are summarised in **Table 2.1**.

**Table 2.1 Summary of Decision Rules**

Decision Required to be made	Decision Rule
1. Are there any unacceptable risks to likely future onsite receptors from impacted soils during development?	The nature and extent of soil impacts will be assessed, and soil analytical data will be compared against EPA endorsed criteria. Statistical analyses of the data in accordance with relevant guidance documents will be undertaken, if appropriate, to facilitate the decisions. The following statistical criteria will be adopted with respect to soils: Either: the reported concentrations are all below the site criteria; Or: the average site concentration for each analyte must be below the adopted site criterion; no single analyte concentration exceeds 250% of the adopted site criterion; and the standard deviation of the results must be less than 50% of the site criteria. And: the 95% upper confidence limit (UCL <sup>6</sup> ) of the average concentration for each analyte must be below the adopted site criterion. If the statistical criteria stated above are satisfied, and an assessment of risk indicates no unacceptable risks, the decision is No. Otherwise, the decision is Yes.
2. Are there any issues relating to the local area background soil concentrations that exceed appropriate soil criteria?	If the 95% UCL of surface soils exceeded published background concentrations (NEPC 1999), the decision is Yes. Otherwise the decision is No.
3. Are there any chemical mixtures	Are there more than one group of contaminants present which increase the risk of harm? If there is, the decision is Yes. Otherwise, the decision is No.
4. Are there any aesthetics issues in fill soils at the site?	If there are any unacceptable odours, anthropogenic materials or staining the answer to the decision is Yes. Otherwise, the answer to the decision is No.
5. Are there any items of UXO present at the site?	If there are any UXO items identified at the site the answer to the decision is Yes. Otherwise, the answer to the decision is No.
5. Is there any evidence of, or potential for, migration of contaminants off-site?	Are contaminants present within natural soils at concentrations exceeding EPA endorsed criteria? If yes, the answer to the decision is Yes. Otherwise, the answer to the decision is No. And If groundwater analytical results exceed the NEPC 2013 criteria and the downgradient groundwater impacted, the decision is yes.

<sup>6</sup> Sampling Design Guidelines (NSW EPA, 1995).

Decision Required to be made	Decision Rule
	Otherwise, the decision is No.
6. Is an update to the site specific risk assessment required?	A Qualitative Risk Assessment has been undertaken for the development site however, if concentrations of TPH/BTEX, PAH, OCPs and explosives are detected above the LOR, an update to the Quantitative Site Specific Risk Assessment will be required.
7. Is a site management strategy required?	Is the answer to any of the above decisions Yes? If yes, a site management strategy will be required to be developed. If no, a site management strategy is not required.

Statistical analyses of the data will be undertaken, if required, in accordance with relevant guidance documents. The following statistical criteria shall be adopted:

- The upper 95% confidence limit on the average concentration for each analyte (calculated for samples collected from consistent soil horizons, stratigraphy or material types) must be below the adopted criterion;
- No single analyte concentration shall exceed 250% of the adopted criterion; and
- The standard deviation of the results must be less than 50% of the criterion.

### 2.1.6 Specify Limits of Decision Error

This step is to establish the decision maker's tolerable limits on decision errors, which are used to establish performance goals for limiting uncertainty in the data. Data generated during this project must be appropriate to allow decisions to be made with confidence.

Specific limits for this project have been adopted in accordance with the appropriate guidance from the NSW EPA, NEPC (2013), appropriate indicators of data quality (DQIs used to assess QA/QC) and standard JBS&G's procedures for field sampling and handling.

To assess the usability of the data prior to making decisions, the data will be assessed against pre-determined Data Quality Indicators (DQIs) for completeness, comparability, representativeness, precision and accuracy. The acceptable limit on decision error is 95% compliance with DQIs.

The pre-determined Data Quality Indicators (DQIs) established for the project are discussed below in relation to precision, accuracy, representativeness, comparability and completeness (PARCC parameters), and are shown in **Table 2.2**.

- **Precision** - measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is assessed by calculating the Relative Percent Difference (RPD) of duplicate samples.
- **Accuracy** - measures the bias in a measurement system. The accuracy of the laboratory data that are generated during this study is a measure of the closeness of the analytical results obtained by a method to the 'true' value. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes and analyses against reference standards.
- **Representativeness** –expresses the degree which sample data accurately and precisely represent a characteristic of a population or an environmental condition. Representativeness is achieved by collecting samples on a representative basis across the site, and by using an adequate number of sample locations to characterise the site to the required accuracy.
- **Comparability** - expresses the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples; ensuring analysing laboratories use consistent analysis techniques and reporting methods.

- **Completeness** – is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study.

If any of the DQIs are not met, further assessment will be necessary to determine whether the non-conformance will significantly affect the usefulness of the data. Corrective actions may include requesting further information from samplers and/or analytical laboratories, downgrading of the quality of the data or alternatively, re-collection of the data.

**Table 2.2 Summary of Quality Assurance / Quality Control Program**

Data Quality Objective	Frequency	Data Quality Indicator
<b>Precision</b>		
Blind duplicates (intra laboratory)	1 / 20 samples	<50% RPD1
Blind duplicates (inter laboratory)	1 / 20 samples	<50% RPD1
<b>Accuracy</b>		
Surrogate spikes	All organic samples	70-130%
Laboratory control samples	1 per lab batch	70-130%
Matrix spikes	1 per lab batch	70-130%
<b>Representativeness</b>		
Sampling appropriate for media and analytes		-
Samples extracted and analysed within holding times.	-	organics (14 days), inorganics (6 months)
Trip spike (for volatiles)	1 per sampling event when sampling for volatile or semi-volatile COPC	70-130% recovery
Trip blank	1 per sampling event for ambient air sampling	<LOR
Rinsate	1 per sampling event where reusable sampling equipment used	<LOR
<b>Comparability</b>		
Standard operating procedures for sample collection & handling	All Samples	All samples
Standard analytical methods used for all analyses	All Samples	All samples
Consistent field conditions, sampling staff and laboratory analysis	All Samples	All samples
Limits of reporting appropriate and consistent	All Samples	All samples
<b>Completeness</b>		
Sample description and COCs completed and appropriate	All Samples	All samples
Appropriate documentation	All Samples	All samples
Satisfactory frequency and result for QC samples	All QA/QC samples	-
Data from critical samples is considered valid	-	Critical samples valid

1. Relative per cent difference

### 2.1.7 Optimise the Design for Obtaining Data

Various strategies for developing a statistically based sampling plan are identified in EPA (1995<sup>7</sup>), including judgemental, random, systematic and stratified sampling patterns. Random sampling is not appropriate. Based on the history of the site a systematic sampling program is considered the most appropriate for any unexpected finds. Testpit locations will initially be placed systematically across the AOC.

### 2.1.8 Soil Sampling Methodology

Testpitting will be undertaken by the Environmental Consultant, with the use of an excavator or backhoe, on a 10 m grid (*in situ* materials and stockpile footprints) or 1 sample per 100 m<sup>3</sup> if

<sup>7</sup> *Sampling Design Guidelines*. NSW EPA. September 1995. (EPA 1995)



potential impacts are identified within a stockpile. Testpits will be extended through fill material or the stockpile to a maximum depth of 0.3 m into natural, whichever is the shallower.

Soil samples will be collected at 0-0.15 m, 0.3 m, 0.5 m and every 0.5 m interval to a maximum depth of 0.3 m into natural materials (or prior refusal). Should physical evidence of gross contamination be identified during the works, sampling locations may be extended to vertically delineate contamination. During the collection of soil samples, features such as seepage, discolouration, staining, odours and other indicators of contamination will be noted. All testpit locations will be recorded with a hand held trimble GPS.

Collected samples will be immediately transferred to laboratory supplied sample jars. The sample jars will then be transferred to a chilled ice box for sample preservation prior to and during shipment to the testing laboratory. A chain-of-custody form will be completed and forwarded with the samples to the testing laboratory.

Where potential ACM has been identified an additional 10 L sample will be collected from each 1 m interval for asbestos quantification, as detailed below:

- Environmental Consultant trained and experienced in the identification of ACM;
- If ACM is identified within stockpiled material, the AQ sample will be collected at a rate of 1/70 m<sup>3</sup> (as per guidance provided in NEPM 2013<sup>8</sup>);
- If ACM is identified within in-situ fill material, the AQ samples will be collected on a 10 m grid across the area;
- Testpit locations will be flagged and surveyed by a Trimble GPS with an accuracy of sub-1 m. GPS data will be used to plot the testpit locations on a site plan, as well as being presented in a tabular format to enable investigations locations to be located (if required) for subsequent remedial works;
- ACM in stockpiled fill material will be quantified by the methods advised in NEPM 2013 and WA DoH 2009. At each sample location, recovered fill material (10 L) will be spread and raked. All ACM will be recovered and bagged. The volume of fill material within the testpit will be calculated and logged;
- One 500 mL soil sample will be collected from within the 10 L AQ sample and submitted for laboratory analysis to assess for the presence of free asbestos fibres and friable asbestos;
- ACM collected and bagged from each testpit will be weighed in-house using an externally calibrated scale with an accuracy of 1 g; and
- Should any fibrous or friable asbestos be observed during field works, these areas will be noted for later excavation for off-site disposal and validation. No allowance is made for management of such material during assessment works.

### 2.1.9 Photo Ionisation Detector

All soil samples will be screened on site during works using a photo-ionisation detector (PID) to assess the presence of volatile organic compounds (VOCs) including petroleum hydrocarbons. Based upon field observations and the PID screening results, samples will be analysed in accordance with the laboratory schedule as detailed in **Table 2.3** below.

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<sup>8</sup> National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No 1) (NEPM 2013)

### 2.1.10 Field Descriptions and Photographic Record

During the collection of soil samples, features such as seepage, discolouration, staining, odours and other indications of contamination (e.g. ACM, staining, odours) will be noted. Photographs of site layout and features will be taken.

### 2.1.11 Decontamination

Prior to the commencement of sampling activities, any non-disposable sampling equipment, including sampling trowel/knife will be cleaned with a water/detergent spray, rinsed with water and then air dried. The equipment will then be inspected to ensure that no soil, oil, debris or other contaminants were apparent on the equipment prior to the commencement of works. Sampling equipment will be subsequently decontaminated using the above process between each sampling location.

### 2.1.12 Duplicate and Triplicate Sample Preparation

Field soil duplicate and triplicate samples will be obtained during the field works. The collected samples will be divided laterally into three samples with minimal disturbance to reduce the potential for loss of volatiles and placed in three clean glass jars and sample bags as appropriate. Each sample will then be labelled with a primary, duplicate or triplicate sample identification before being placed in the same chilled esky for laboratory transport.

### 2.1.13 Laboratory Analysis

The Environmental Consultant will contract a NATA registered primary and secondary laboratory for all analyses.

Laboratory analysis of samples will be conducted as summarised in **Table 2.3**.

**Table 2.3 Unexpected Finds Sampling and Analytical Program**

Potential Unexpected Find	Sampling Frequency	Analytes
Discoloured / Odorous soils (visible and odorous); Drums / bottles / containers of chemicals (visible); Construction / demolition waste (visible); Ash and/or slag contaminated soils / fill materials (visible); Petroleum contaminated soils (staining / discolouration visible); or Volatile organic compound contaminated soils (odorous).	10 m grid Or 1 per 100 m <sup>3</sup>	Heavy Metals <sup>1</sup> TPH/BTEX PAHs OCP/PCBs Explosives <sup>2</sup> Asbestos
Potentially asbestos containing sheeting, fragments or insulation materials (visible)	10 m grid Or 1 per 70 m <sup>3</sup>	Asbestos
Uncovering in-ground infrastructure (e.g. underground storage tanks, USTs)	As per EPA 2014 <sup>9</sup>	Heavy Metals <sup>1</sup> TPH/BTEX VOCs PAHs Phenols MTBE

<sup>1</sup> Heavy metals analysis includes As, Ba, Cd, Cr, Cu, Pb, Ni, Hg, Ni, Zn.

<sup>2</sup> Explosives analysis will include but not limited to RDX, TNT, 2,4-DNT and 2,6-DNT

In addition to the above analyses, for QA/QC purposes field duplicates and triplicates will be analysed at a rate of 1/20 primary samples. Rinsate samples will be obtained from all reusable sampling equipment per sampling event, and trip spike and trip blank samples will accompany the soil samples for each batch of samples submitted to the laboratory.

<sup>9</sup> *Technical Note: Investigation of Service Station Sites*, NSW EPA, 2014 (EPA 2014)

#### 2.1.14 Potential Groundwater Contamination

Based on the previous remediation and validation works conducted across the former ADI St Marys Property, it is considered unlikely groundwater has been impacted. However should other indicators of potential groundwater contamination be noted during any unexpected find assessment works, then the installation and sampling of groundwater wells will be recommended.

Indicators for potential groundwater impact can include the following:

- Concentration of contaminants in soils above the site criteria within natural soils; and / or
- Odours or sheen on seepage water.

Groundwater assessment, if required, should consider DEC (2007) guidance, including adoption of appropriate groundwater investigation levels protective of relevant environmental values. Reference will also be given to the SAQP (JBS&G 2017a).

It is noted that additional groundwater assessment for PFAS was also conducted in the PFAS Human Health and Ecological Risk Assessment (HHERA) (JBS&G 2017c<sup>10</sup>).

#### 2.1.15 Remediation and Validation of Unexpected Finds

If any of the decisions in **Table 2.1** are 'yes', i.e. where unexpected finds are assessed as a potential human health risk to remain on the Central Precinct, the AOC will be remediated and validated in accordance with the SRAP (JBS&G 2017b).

Upon successful validation of the AOC the environmental consultant shall prepare a validation/clearance letter.

### 2.2 Potential Explosive Ordnance Materials

#### 2.2.1 State the Problem

While the majority of the Central Precinct has been investigated and remediated for metallic debris and / or ordnance items the potential remains for unexpected finds of ordnance related materials during the redevelopment of the precinct.

Potential explosive ordnance material may be indicated in the field by:

- Munitions shells / projectiles;
- Flares;
- Ammunition packaging;
- Grenade components; or
- Metal debris not identifiable as non-munitions or of uncertain origin.

Should potential ordnance material be uncovered, the earthworks will cease immediately and the Principal Contractor informed. The area should be quarantined, by means of some appropriate barrier to prevent access to the area to protect the workforce from potential injury.

The Environmental Consultant shall contact an appropriately qualified Ordnance Contractor, to assess the item and/or the area.

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<sup>10</sup> PFAS Human Health and Ecological Risk Assessment – Former St Marys ADI Property Central Precinct Llandilo, NSW (Rev C) JBS&G Australia Pty Ltd (JBS&G 2017c)

Should the Ordnance Contractor consider the object(s) to be non-ordnance or harmless fragments of ordnance, the object(s) can be removed and disposed of appropriately. The quarantine restrictions can be lifted and the earthworks continued.

If the Ordnance Contractor identifies the object(s) as potential explosive ordnance, the Ordnance Contractor shall inform the Environmental Consultant and Principal Contractor, and arrange disposal.

Based on the nature of find, it may be recommended that a geophysical survey of the area be undertaken to establish whether the item was an individual piece, one of a number of pieces or a disposal pit. Further surveys are mandatory if the explosive ordnance is considered a Category A item or more than three readily identifiable Category B items are found at one location.

- Category A - An item clearly of a military nature and which might readily be recognised by a member of the public as such (e.g. in effect complete in appearance as a projectile of 20 mm calibre or greater, hand grenade, mortar, bomb, etc) and containing explosive filling, but excluding small arms ammunition.
- Category B - An item clearly of a military nature and which might readily be recognised by a member of the public as such (e.g. in effect complete in appearance as a projectile of 20 mm calibre or greater, hand grenade, mortar, bomb, etc) and not containing explosive filling, but excluding small arms ammunition.

Any additional ordnance surveys should be designed to characterise the extent and character of the ordnance contamination and then (or concurrently) to remove the contaminant so the area is safe for the development activities to resume. These surveys should be undertaken by an Ordnance Contractor, with the objective of characterising and delineating the extent of the explosive ordnance contamination. The survey should be in accordance with **Sections 2.5.3 to 2.5.5**. In the event that ordnance is discovered the search area may need to be extended to ensure a suitable buffer zone is searched.

The Ordnance Contractor will prepare a report on the investigations undertaken, any remediation works undertaken and validation surveys completed. The quarantine restrictions on the area can be removed and the earthworks resumed.

### **2.2.2 Objectives (Decision)**

The principal objectives based on the issues and uncertainties stated in **Section 2.5.1** are:

- Locate, remove and validate the ordnance potentially present within fill materials within the AOC.
- Confirm/validate the removal of the ordnance via review and reporting of clearance documentation.
- If required, confirm there are no items the size of a complete 20 mm projectile within 150 mm of the finished surface within the site.

### **2.2.3 Identify Inputs to the Decision**

Inputs identified to determine the location of ordnance within the AOC include progress records including dig sheets, images, shallow search logs and clearance certificates covering the AOC.

### **2.2.4 Define the Study Boundaries**

Each AOC identified and investigated and where required, remediated, will be surveyed to provide accurate boundaries.

## 2.2.5 Methodology

### Shallow Search

The AOC will be marked out with rope into two one metre lanes between 20 – 40 m in length.

The area will then be searched with a MineLab F3 UXO Metal Detector with a black cap to locate all metallic objects in the top 150 mm of the ground surface. A GPS will be attached to the operator to track the walked lanes.

All metallic items of the size of a 20 mm projectile or greater will be identified, recorded and removed from the AOC.

### Deep Search and Imaging

An imaging survey (deep search) utilising an EM61 Deep Metal Detector (MK1 unit) on a 0.75 to 1.0 m line spacing and a Differential Global Positioning System (DGPS) for the positioning of the digital data will be undertaken.

Data will be processed and imaged using suitable UXO data processing package.

The criteria for target investigation will be based on a clearance to a depth of one (1) metre for ordnance items such as 20 pound (lb.) projectile and greater.

The threshold for interpretation is set at 3.5 mV with lower amplitude anomalies picked at the discretion of the Processing Geophysicist.

### Location Pegging

Anomalies will be pegged and investigated using an EM61 Deep Digital Metal Detector in relocation mode.

### Item Removal

On removal of a metallic item from an AOC, the location will be searched again to ensure a deeper item is not being masked by the original find. This process will be repeated until the location gives no more responses.

The initial search is a 0.5 m radius around the peg. If nothing is found the search will be extended to 1.5 m radius around each peg. If after the extended search nothing is found the ordnance supervisor (or senior operator if ordnance supervisor is original searcher) will search the peg to 1.5 m radius. If nothing is found the find will be recorded as an unable to locate (UTL).

### Daily calibration

#### *F3 Minelab (Shallow Search)*

The F3 MineLab is calibrated firstly by using the set procedures in the F3 Manual using the 'Test Piece' supplied by the manufacturer with the detector. This confirms that the detector is working to correct specifications to confirm the sensitivity of the unit.

Before proceeding into the field the unit is also operated over the field test site where a 20mm projectile is buried at 150 mm depth. Provided a signal is obtained over this target the unit is ready for field operations.

This information will be noted on the Daily Diary.

#### *EM61 (Deep Search)*

Prior to Geophysical data collection each day, the EM61 will be run over a test pit to confirm the successful operation of the unit as detailed below:

- A backfilled test pit will be set-up on site containing various items (equal or greater than a 20 lb) anticipated to be buried on the site.
- The items will be buried, horizontally, at varying depths of up to 1 m (from top of target) to confirm the correct operation of the EM61 Deep Metal detector and its ability to meet the specifications for the deep search.
- The EM61 will be allowed to warm up until the readings stabilises (usually 10-15 minutes).
- The EM61 will then be moved to an area determined as a 'clean' area and the instrument will be nulled.
- Once this has been completed data will be collected over the backfilled test pit.
- The ability of the equipment to detect the seeded target will be assessed by the Geophysicist in the field.
- The test data will also be stored with all other data to show evidence of the systems functionality.

This calibration method will be used to establish a cut-off for detection of the EM61 Deep Search detector.

#### Limit of Reporting

A trial of the response of the EM61 must give a 3.5 mV response over a 20 lb projectile, buried at a depth of 1 m prior to use on site.

All data anomalies are to be selected for investigation at a level of 3.5 mV and above. However, a small number of targets with slightly lower amplitude will also be picked at the discretion of the Processing Geophysicist.

At the completion of anomaly investigation, a 10% of area shallow search will be carried out with an appropriate Electromagnetic Detector. If during QC a metallic item is located of a size equivalent to or greater than a 20 mm projectile, the search grid will be subject to a 100% shallow search again followed by a QC search.

The survey is carried out using Digital Global Positioning System (DGPS) for positioning then the operator is to ensure at the end of each line that positional accuracy is better than 0.3 m.

At the end of the day, data will be downloaded to a processing computer and checked for inconsistencies.

Checks include rejecting noisy lines. Lines will be redone if problems are encountered.

Data will be processed and interpreted by a Geophysicist. At the completion of processing a Senior Processing Geophysicist will complete a QC review of each grid.

To assure procedures are effective, at the completion of the clearance operation a 10% of area QC check will be performed. During any of the QC checks, location of a fail-size item within the soil will trigger a 100% repeat search of that grid.

### **2.3 Temporary Stockpiling of Materials**

Earthworks in the development phase are likely to, temporarily, generate excess material which may be stockpiled for re-use. Unless some event or observation indicates the material excavated and placed into the stockpile is potentially contaminated, no particular treatment is required other than normal dust suppression, and erosion controls in accordance with relevant Council requirements.

Material movement around the site will be managed in accordance with the SRAP (2017b), IFP JBS&G (2015<sup>11</sup>) (including addendum IFP JBS&G (2017c<sup>12</sup>)) which specifies the material tracking and stockpiling procedures and also verifies suitable materials for relocation from Central Precinct to Dunheved including placement requirements.

If assessment by the Environmental Consultant or the Ordnance Contractor identifies contamination, or a stockpile is observed to be contaminated, then the Environmental Consultant will assess the stockpile in accordance with **Sections 2.1 and / or 2.2** to delineate the contamination and assess the extent of remediation, if required.

Subject to the agreement of the relevant Consultant, it may be possible to move and stockpile the affected material. Where temporary stockpiling is permitted such stockpiles shall be installed and maintained to eliminate risk to workers and other people due to exposure to contaminants in dust or vapours and risk to the environment as a result of silt or contamination of stormwater in accordance with the JBS&G SRAP (JBS&G 2017b).

Validation sampling (JBS&G 2017b) and surveying of the AOC and stockpile would be required before earthworks continue in the AOC.

It is noted that the most recent version of JBS&G documentation should be adopted at the time that works may be occurring. It is noted that the IFP (JBS&G 2015) and addendum IFP (JBS&G 2017c) are currently not endorsed by the auditor and therefore future changes to these documents could occur.

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<sup>11</sup> *Imported Fill Protocol – Central Precinct, Llandilo, NSW*. October 2015 (Rev 3i) JBS&G Australia Pty Ltd (JBS&G 2015)

<sup>12</sup> *Dunheved Addendum to the Imported Fill Protocol – Central Precinct Llandilo, NSW*. 11 December 2017 (Rev 0) JBS&G Australia Pty Ltd (JBS&G 2017c)

### 3. Asbestos Management Plan

An Asbestos Management Plan (AMP) is required to ensure asbestos containing materials (ACM) or asbestos impacted soils encountered at the Central Precinct during redevelopment and/or remediation is appropriately managed to ensure protection of human health of site workers, future site workers and the neighbouring community. This AMP also outlines the requirements for managing any potentially asbestos impacted fill materials identified as unexpected finds and for managing asbestos impacted stockpiles such as those in EW14.

#### 3.1 Objectives

The purpose of this AMP is to outline the required procedures for handling and disposing of any identified ACM and asbestos impacted soils during the bulk earthworks and remediation of the Central Precinct, to outline the measures required to protect the health and safety of Central Precinct workers who may encounter asbestos containing materials or asbestos impacted soils whilst completing the planned works and to prevent any adverse health effects on any future workers or neighbouring community in accordance with relevant National Codes of Practice and Work Health and Safety Legislation.

Specifically, the objectives are to:

- Outline, monitor and enforce safe working condition for all workers;
- Outline, monitor and enforce safe environmental conditions for all persons outside of the Area of Concern;
- Outline, monitor and enforce procedures to manage works within asbestos impacted soils identified in the Central Precinct during works;
- Outline measures for the safe onsite storage and, if required, off-site disposal of asbestos materials in accordance with all relevant legal and statutory requirements; and
- Outline ongoing management requirements of the Central Precinct to ensure the risk posed by any potential asbestos contamination is properly managed.

#### 3.2 AMP Responsibilities during Redevelopment Works

##### 3.2.1 Appointment of Principal Contractor

In accordance with the provisions of the Work Health and Safety Regulation 2011 prepared under the Work Health and Safety Act 2011 Liberty Industrial has been appointed as the “person conducting a business or undertaking” (PCBU), or Principal Contractor.

##### 3.2.2 Responsibilities of the Principal Contractor

Responsibilities of the Principal Contractor include, but are not limited to the following. The Principal Contractor must:

- Be responsible for the proposed project work at all times until the work is completed;
- Ensure that all persons involved with proposed project work have undertaken occupational health and safety training if ACM is identified;
- Keep records of induction training for workers and any specific training;
- Ensure that any subcontractors provide safe work method statements for the activities for which they are engaged;
- Monitor any subcontractors to ensure that they are complying with the safe work method statements; and



- Maintain a hazardous substances register for all hazardous substances used or present on Central Precinct.

The Principal Contractor is responsible for co-ordinating health and safety activities for the project. Other responsibilities of the Principal Contractor include:

- Compliance with occupational health and safety and environmental legislation, regulations, standards, codes and the Central Precinct specific rules relating to safety contained in this AMP;
- Ensuring that sufficient funds are available to procure the necessary health and safety equipment such as personal protective equipment (PPE);
- Managing accident and emergency procedures;
- Managing workplace injury management and rehabilitation.

The Principal Contractor has the authority to provide for the auditing of compliance with the provisions of this AMP, suspension or modification of work practices, and administration of disciplinary actions for individuals whose conduct does not meet the requirements set forth herein.

### **3.2.3 Asbestos Consultant or Competent Person**

An Asbestos Consultant or Competent person, shall be engaged to assess any suspected asbestos containing materials when encountered during the redevelopment of the Central Precinct. The asbestos consultant or competent person shall also complete airborne asbestos monitoring and dust monitoring during any asbestos works. Where required, air monitoring will be conducted in accordance with **Section 3.6.1**.

The Asbestos Consultant shall:

- Provide on-site supervision of all potential asbestos works;
- Complete static asbestos air monitoring during any potential asbestos works and display daily results for the information of workers;
- Provide on-site advice, if required, in relation to suspected asbestos containing materials and the management of asbestos issues associated with the works; and
- Be available, if required, for consultation with regards to the conditions and requirements of this AMP.

Should asbestos be encountered during the planned excavation works, additional clearance inspections and clearance asbestos air monitoring may be required to confirm the suitability of the Area of Concern prior to works recommencing.

### **3.2.4 Class A/ B Licensed Asbestos Removal Contractor**

A Class A (friable) or Class B (non-friable) licensed asbestos removal contractor shall be engaged if ACM is identified. The asbestos removal contractor will remove ACM or asbestos impacted soils from the Area of Concern and dispose of them to a suitably licensed waste facility. The licensed asbestos removal contractor will be the primary person responsible and in charge for works on site involving ACM or asbestos impacted soils.

Their responsibilities include:

- Complete a site walkover and 'emu-pick' to remove any observed ACM on the ground surface prior to any topsoil stripping works commencing;

- Completion of required WorkCover permits (friable asbestos removal) or notifications (non-friable asbestos removal);
- Prepare a site specific Asbestos Removal Control Plan (ARCP) prior to any asbestos removal works being completed;
- Ensuring compliance with relevant legislation and the conditions of this AMP;
- Removal and disposal of asbestos containing materials or asbestos impacted soils from the site in accordance with relevant legislation;
- Ensure appropriate environmental and safety controls outlined in this AMP are maintained for the duration of the works;
- Assisting all site sub-contractors where required in complying with relevant legislation and the procedures outlined in this AMP; and
- Completion of a final site walkover and removal of all visible asbestos containing material from the ground surface across the site.

### **3.3 Summary of Contaminant Type**

Friable asbestos is defined by Safe Work Australia in the Code of Practice – How to Safely Remove Asbestos (2011) as being “...material that is in a powder form or that can be crumbled, pulverised or reduced to a powder by hand pressure when dry, and contains asbestos”. This includes asbestos fibre impacted soils and asbestos fines as identified by laboratory analysis.

Non-friable asbestos material is defined by Safe Work Australia (2011) as being “...material containing asbestos that is not friable asbestos, including material containing asbestos fibres reinforced with a bonding compound.” This includes bonded asbestos fragments found in soils, subject to laboratory analysis for respirable fibres.

Mechanical disturbance of the fragments may result in the release of fibres and therefore, such activities should be managed to prevent any fibres becoming airborne. The health effects of asbestos are detailed in enHealth (2005)<sup>13</sup> Management of Asbestos in the Non- Occupational Environment.

The primary issue associated with the asbestos contamination is inhalation of respirable fibres if the materials were to be disturbed and abraded.

A secondary issue with asbestos contamination is disposal of excess spoil that may be impacted with asbestos.

### **3.4 Health and Safety Management**

#### **3.4.1 Safe Work Method Statements**

Safe work method statements must be prepared by the Principal Contractor or by subcontractors completing significant intrusive works and also covering other aspects of the proposed project works not related to significant intrusive works, are to be prepared and approved by the Principal Contractor prior to those activities commencing.

Safe Work Method Statements must:

- Describe how work is to be carried out;
- Identify the safety risks;

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<sup>13</sup> *Management of Asbestos in the non-occupational environment.* enHealth, 2005 (enHealth 2005)

- Describe the control measures that must be applied to the work;
- Describe the equipment used in the work;
- Describe any standards or codes applicable to the work; and
- Training and qualifications required of persons undertaking the work.

Safe work method statements for all workers must be reviewed and approved by the Principal Contractor.

### 3.4.2 Site Access Control

The Principal Contractor shall ensure if works are to occur in an area in which ACM has been identified that the construction area is securely fenced and access is controlled. Entrance to the asbestos area will be via a dedicated entry point which will contain the following features in addition to site security measures as required for a construction site as per relevant health and safety provisions:

- Readily identifiable and delineated site access / egress point. Where possible this location shall be visibly identifiable by site fencing / barricading;
- Decontamination unit for all workers to remove PPE and dispose of contaminated articles and will also include a hand wash and boot wash facility. The decontamination unit will be located in close proximity of the designated site access / egress point;
- Signage including “No Entry Without Required PPE” and a contact number for members of the public to direct any queries / complaints; and
- Emergency contact details.

The overall construction site boundary will be secured by fencing. It is anticipated if areas of ACM are identified then localised active construction site access points maybe delineated within the overall site boundaries. Access to the construction site will be controlled and permitted by the Principal Contractor only after persons entering the site have been advised of the potential contamination hazards. This shall at least include notification of the potential presence of asbestos containing materials and asbestos impacted soils.

If ACM is identified then any authorised person accessing the site should do so in accordance with health and safety requirements as indicated in this AMP. The implementation of the health, safety and environmental requirements should be administered by the Principal Contractor.

Site access will not be allowed until the workers have been inducted, have signed in, and if entering the asbestos area must have donned the required PPE (**Section 3.4.5**). Upon exiting the site, personnel must remove and dispose of/clean the PPE in the provided decontamination area.

Asbestos removal boundaries (if required) shall be determined by the Principal Contractor in consultation with the asbestos consultant and will vary according to the location and size of the required daily activities. Any asbestos removal boundaries will be designed to allow other site works not involving significant intrusive works to continue without being required to adhere to this AMP.

It may be found that the asbestos removal boundaries require to be assigned to the site boundaries, in which case all site workers must adhere to the requirements of this AMP.

### 3.4.3 Training and Certification

The Principal Contractor must not allow any person to carry out project works unless he/she are satisfied that the person has undergone OHS induction training.

The OHS induction training required by the Regulation is as follows:

- General occupational health and safety training for construction work;
- Work activity based health and safety training (job specific training); and
- Site-specific health and safety induction training.

For each person carrying out project works, for a period of three years, the Principal Contractor must keep a record of the following:

- A copy of relevant statements of OHS induction training, or a statement indicating that the Principal Contractor is satisfied that the relevant OHS induction training has been undertaken; and
- A brief description of the site-specific training undertaken by the person.

#### **3.4.4 Site Safety Induction**

If ACM is identified it is the responsibility of the Principal Contractor to ensure all persons carrying out construction work on site are given site-specific occupational health and safety training. The induction shall be undertaken by the Principal Contractor. The induction shall be undertaken as per a standard presentation which will address the following topics as per the requirements of this AMP:

- Identification of any site specific hazards and risk control measures in relation to the asbestos impacted nature of the site;
- Regulatory requirements or codes of practice relevant to identified site specific hazards as restricted to asbestos impact;
- Directions on what to do if suspected asbestos containing materials or asbestos impacted soils are encountered
- Site orientation at least including location of asbestos decontamination areas at site access / egress points; and
- Site specific safety rules in relation to asbestos.

The Principal Contractor is responsible for establishing site specific safety rules. The rules must be displayed in an easily observable location (nominally in the site office) so as to ensure that all site workers, have ready access.

At the completion of the Induction Presentation, each worker shall be required to acknowledge that they have understood the requirements for the site works and health, safety and environmental obligations by completion of a Site Induction Form.

#### **3.4.5 Personal Protective Equipment (PPE) Requirements**

Prior to any asbestos containing materials or asbestos impacted soils being encountered, no additional PPE is required above the standard construction site PPE outlined by the Principal Contractor for the site. Should suspected ACM be identified then the supervising asbestos consultant should be contacted, the following additional items of PPE are required in addition to the standard construction site PPE outlined by the Principal Contractor for the site, and applies for any ground workers within the asbestos work area, as defined by the supervising asbestos consultant:

- Disposable 'tyvek' coverall suits must be worn;

- Disposable gloves – non disposable gloves must be cleaned within the decontamination unit in accordance with Safe Work Australia (2011);
- P2 class respirator or higher – non disposable respirators must be cleaned in the decontamination unit in accordance with Safe Work Australia (2011) and
- Laceless steel capped rubber soled work shoes or gumboots.

Plant operators must close cabin doors and windows and set air conditioning to re-circulate when operating within the asbestos work area.

### **3.4.6 Management of Subcontractors**

If ACM is identified then workers on-site will be required to adopt the provisions of this AMP and will be advised of potential safety and environmental issues on site during site-specific induction training. This induction will include the occupational health and safety responsibilities, requirements and controls for all workers on site. All workers activities involved in asbestos works will be monitored by the Principal Contractor, the licensed asbestos removal contractor and the Asbestos Consultant to ensure compliance with the requirements of this AMP.

Workers whose work will be performed on-site, or who otherwise could be exposed to health and safety hazards, will be advised of known hazards through distribution of site information contained in this AMP.

They shall be solely responsible for the health and safety of their employees and shall comply with all applicable laws and regulations. All workers are responsible for:

- Providing their own personal protective equipment as required by the Principal
- Conditions set out in this AMP;
- Training their employees in accordance with applicable laws;
- Providing medical surveillance and obtaining medical approvals for their employees, as appropriate;
- Ensuring their employees are advised of and meet the minimum requirements of this AMP and any other additional measures required by their site activities; and
- Designating their own site safety officer.

Workers must sign an acceptance form prior to commencing work on site. Workers may only modify, and then only to improve, the conditions specified in this AMP with approval from the Principal Contractor, or his nominee.

## **3.5 Environmental Management**

### **3.5.1 Asbestos Works**

In the event that significant asbestos contamination is identified and intrusive works are to be carried out in the asbestos work area then the following management measures will apply:

Prior to any intrusive work commencing:

- Review of the information available for the site;
- Approval for the works must be sought from the Principal Contractor who will assess whether the works are necessary or if there is an alternative that will not result in exposure of ACM impacted soils. The Principal Contractor's must review the job specific risk assessment (JSRA) and safe work method statements (SWMS) and ensure that workers who will undertake the works are inducted into the AMP;

- The asbestos consultant must complete supervision of the significant intrusive works and complete regular inspections for the presence of visible asbestos. Static airborne asbestos monitoring must also be completed by the asbestos consultant for the duration of significant intrusive works;
- The works area must be isolated from casual entry using temporary barriers and only personnel inducted in the requirements of the AMP will be permitted to enter the works area;
- Sufficient room must be provided within the works area to allow stockpiling of spoil from excavations, if required, in accordance with **Section 3.5.4**;
- A water supply must be provided to the works area for the purpose of maintaining exposed asbestos impacted fill or soil in the excavations and stockpiles in a moist state;
- Personnel entering the works area must wear appropriate PPE in accordance with **Section 3.4.5**;
- Stockpiles of excavated spoil must be managed in accordance with **Section 3.5.4** and **3.5.5**; and
- Air monitoring requirements must be met as outlined in **Section 3.6**.

Should visible asbestos be identified by the asbestos consultant or airborne asbestos monitoring results identify airborne asbestos fibres in the vicinity of the works area, specific requirements for working with asbestos containing materials or asbestos impacted materials shall be enforced as outlined in **Section 3.5.2**.

### **3.5.2 Specific Requirements for Working with Asbestos Impacted Material**

Asbestos may be present in non-friable or friable form. In the event that either friable or non-friable asbestos is encountered, as determined by the asbestos consultant, the following procedures shall be implemented for the remaining significant earthworks to ensure workers safety and to mitigate any potential off site migration of contamination.

#### **Friable and Non-Friable Asbestos**

##### *Prior to Excavation*

- Workers and visitors to the asbestos work area will be made aware of the encountered soil contamination and only authorised people shall enter the asbestos work area, which must contain a perimeter barrier separate to the site boundaries to restrict entry. Where the asbestos work area boundary is also the site perimeter boundary, an exclusion zone of at least 5 m shall be erected beyond the site perimeter boundary (if practical/possible) to restrict access to the asbestos work area.
- Asbestos removal caution signs shall be placed on the perimeter barrier (or exclusion zone barrier, whichever is furthest from the asbestos removal work area), as per AS1319.

##### *During Excavation/Transport/Disposal*

- A WorkCover permit for friable asbestos removal works or WorkCover notification for non-friable asbestos removal works shall be sought by the licensed asbestos removal contractor. Friable asbestos removal permits must be submitted at least 7 days prior to any friable asbestos being disposed off-site.
- All wastes will be classified, managed and disposed in accordance with the Waste Classification Guidelines: Part 1 Classifying Waste (DECCW 2009).

- Personnel within the excavation work area shall wear a Tyvek suit, respirator (e.g. half faced P2 respirator), disposable gloves and laceless steel capped rubber soled work shoes or gumboots at all times when within the asbestos work area and until clearance certification is provided by the asbestos consultant.
- Any obvious pieces of asbestos containing materials shall be picked up and placed into a labelled asbestos waste bag and set aside in a designated waste storage area for off-site disposal.
- The excavation shall be kept damp by water spraying at all times during excavation to reduce the possibility of dust generation.
- Personal protective equipment used during the works, such as disposable coverall suits and half faced respirators, shall be disposed of as asbestos waste.
- Airborne asbestos monitoring shall be conducted for the duration of the excavation works.
- Any stockpiled excavated material shall be kept moist and covered if left for more than 24 hours.
- Appropriate leak proof transport vehicles must be used to transport materials offsite.
- Transport vehicle shall be covered prior to leaving site and any material removed from wheels to prevent tracking outside the site.
- Backfill of any areas to required levels must only be completed with clean imported material classified as VENM as per Waste Classification Guidelines: Part 1 Classifying Waste (EPA 2014<sup>14</sup>) and can include mulch and landscaping materials and must be classified as VENM as per Waste Classification Guidelines: Part 1 Classifying Waste (EPA 2014) and can include mulch and landscaping materials.

#### Post Excavation

- Any excavation floor and walls shall be inspected by the asbestos consultant who is trained and experienced in the identification of asbestos. Any visible ACM shall be removed by the licensed asbestos removal contractor.
- Where friable asbestos has been encountered, validation samples shall be collected from the excavation walls and base and analysed at a NATA Accredited testing laboratory for the presence of asbestos. Clearance airborne asbestos monitoring shall also be conducted following the completion of the excavation and reinstatement works to be included in clearance certification. Clearance monitoring is not required if only non-friable asbestos is encountered.
- Upon receipt of both visual and laboratory data (where required) confirming the absence of asbestos, the asbestos work area shall be deemed suitable for reoccupation and a clearance letter shall be provided by the asbestos consultant.

### 3.5.3 Disposal and Storage of Asbestos Containing Materials

Where asbestos fragments or other forms of asbestos are identified either during redevelopment works or on the ground surface, these materials should be removed under the supervision of a licensed asbestos removal contractor and in accordance with Safe Work Australia (2011).

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<sup>14</sup> Waste Classification Guidelines Part 1: Classifying Waste. EPA November 2014

The asbestos materials should be placed into heavy-duty 200µm (minimum thickness) polythene bags that are no more than 1200 mm long and 900mm wide. The bags should be labelled as asbestos waste, sealed and placed in a designated waste area for off-site disposal.

#### **3.5.4 Stockpile Management**

Any stockpiles of excavated materials, including topsoil and grass cover, will be periodically sprayed with water to control dusts.

In the event that covers are required, they shall extend beyond the perimeter of the stockpiles and shall be secured to prevent being blown away by wind.

Stockpiles must be placed in a secure location onsite and covered if to remain for more than 24 hours.

#### **3.5.5 Dust Management**

Dust levels shall be managed by ensuring:

- All stockpiles will be either periodically wetted down or covered to control dusts;
- Water sprays will be used on the excavation areas, stockpiles and haulage pathways;
- Any haulage vehicles shall be covered and leave via the designated (stabilised) site access;
- All haulage vehicles and plant and equipment shall be washed down whenever they leave the Asbestos in Soil (ASBINS) work area.
- All access roads are sufficiently maintained to ensure no visible dust at the site boundary; and
- Dust suppressors will be fitted to equipment as required.

If dust is visible at the site boundary, then additional dust control measures shall be employed, which may include:

- Temporarily suspending activities until winds speeds reduce; and/or
- Additional use of water sprays.

#### **3.5.6 Waste Management**

There shall be no wastes brought onto the site for storage, treatment, processing, reprocessing or disposal unless permitted by a licence issued under the POEO Act.

All wastes will be classified, managed and disposed in accordance with the Waste Classification Guidelines: Part 1 Classifying Waste (EPA 2014).

All wastes disposed off-site will be controlled as per the EPA's requirements for waste tracking and acceptance. These are as follows:

- Obtain a written consignment authorisation number from an EPA-licensed waste disposal or treatment facility before moving waste to the facility.
- Accurately complete a waste data form signed by the consignor before the waste is dispatched.
- The waste consignor, the waste transporter and the waste facility must each keep a copy of the waste data form for up to four years for auditing purposes.
- The waste consignor must give a completed copy of the waste data form to the transporter, who must check that it is completed and then sign it. The driver must carry the waste data form in the vehicle.



- The transporter must give a completed copy of the waste data form to the waste facility on arrival at the destination. The waste facility operator must check the load details on the form. The waste data form must be signed by a representative of the waste facility on receipt of the waste at the destination.
- The waste consignor must receive from the waste facility written confirmation of receipt of the waste within 21 days of dispatch. This must be kept for up to four years for auditing purposes.

### 3.6 Monitoring Program

In the event that significant asbestos is found a monitoring program may be needed to ensure that the control measures being implemented at the site are effective, the following monitoring procedures will be implemented:

- Daily static airborne asbestos fibre monitoring at site boundaries during significant asbestos works; and
- Clearance monitoring (if friable asbestos is encountered only).
- Site Inspections.

#### 3.6.1 Daily Static Airborne Asbestos Fibre Monitoring

During excavation works or any other works that may disturb significant asbestos in soil on site, airborne asbestos fibre monitoring may be undertaken by the Asbestos Consultant using calibrated portable air sampling pumps. Monitoring will be conducted at 4 locations around the site boundaries each day over an approximate 4 to 6 hour period and targeting any neighbouring sensitive receptors and with consideration to the daily location of works.

At the end of each monitoring period the pump and attached filter will be collected and analysed at a NATA-accredited laboratory in accordance with NOHSC Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition (NOHSC:3003 [2005]).

The results of air monitoring will be available on a 24-hour turnaround time basis. Daily air monitoring reports shall be displayed in a common area outside of the asbestos work area (e.g. site office or lunch shed) or be able to be produced upon request.

The following action levels will be applied upon receipt of daily results, as outlined in the Safe Work Australia (2011):

- Reading of less than 0.01 fibres/mL – control measures in place are working effectively, site works to continue;
- Reading between 0.01 and 0.02 fibres / mL – a review of control measures shall be completed in the work area; and
- Reading greater than 0.02 fibres / mL – works shall cease until the cause of contamination is identified and rectified.

It is noted that these action levels adopted are more conservative than the exposure standard for airborne asbestos (0.1 fibres/mL (TWA)) as outlined in the Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC: 1003(1995)] for an 8 hour shift.

#### 3.6.2 Clearance Monitoring

In the event that friable asbestos is encountered during the excavation works, clearance airborne asbestos monitoring shall be required following the friable asbestos removal. Following the completion of all earthworks, backfill of the excavated area and installation of the proposed car

park, clearance air monitoring will take place in the vicinity of the work area to ensure that there is no residual contamination remaining at the site.

Ambient air conditions clearance will be gained by recording airborne asbestos concentration levels in all sampling locations below 0.01 fibres / mL.

### **3.6.3 Site Inspections**

Following the completion of any asbestos removal works, a final site walkover will be completed by the asbestos consultant to inspect the site ground surface for the presence of ACM. Any ACM observed will be removed and placed in asbestos waste bags in accordance with Safe Work Australia (2011). Once a successful inspection has been completed and both the licensed asbestos removal contractor and the asbestos consultant are satisfied there is no visible residual asbestos impacts on the ground surface, the area shall be deemed suitable for re-occupation and a clearance report issued by the asbestos consultant.

## 4. Limitations

This advice is provided for use by the client who commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties. The advice has been prepared specifically for the client for the purposes of the commission. No warranties, express or implied, are offered to any third parties and no liability will be accepted for use or interpretation of this advice by any third party.

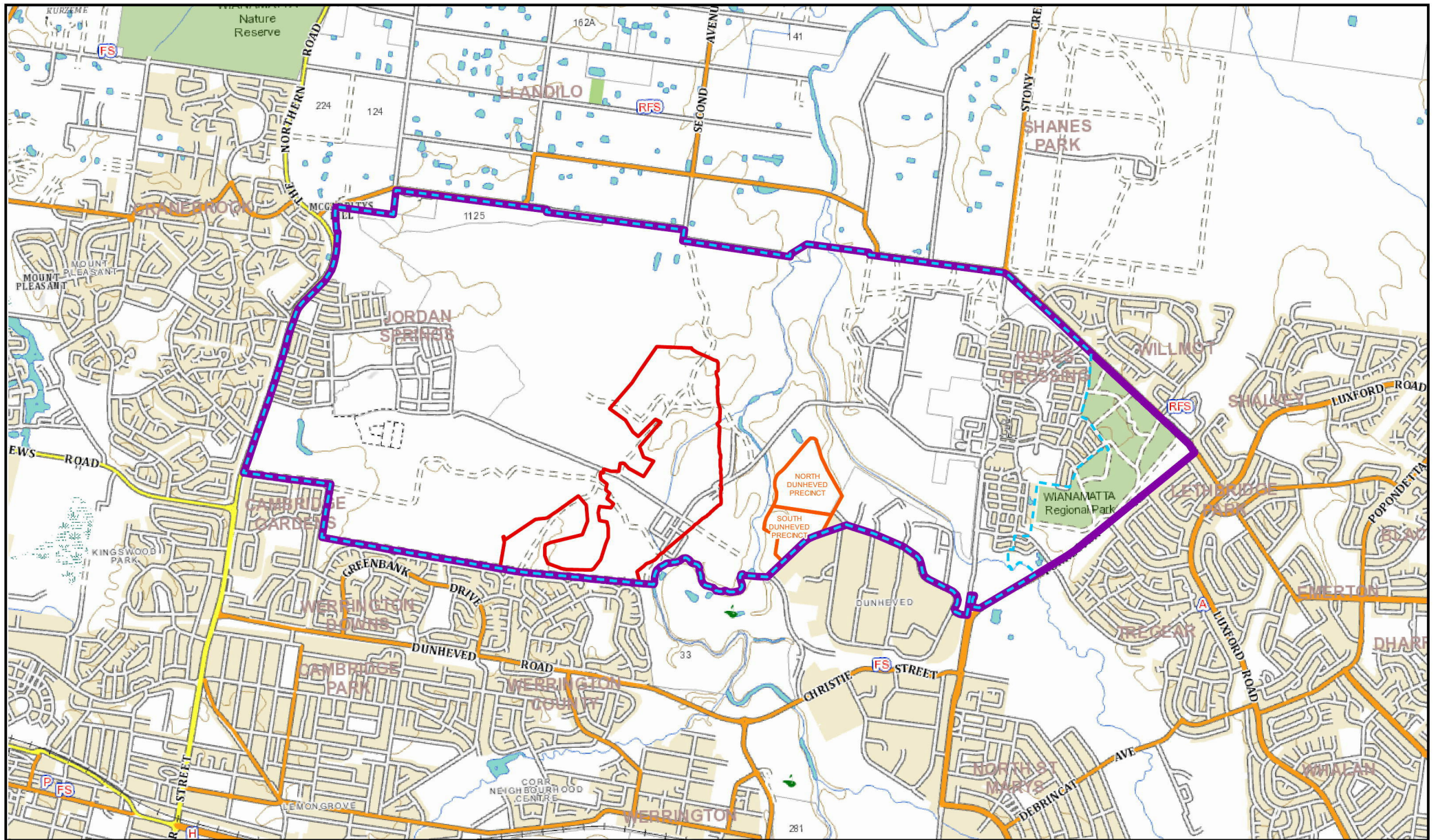
The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G.

Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, that were not identified in the site history and which may not be expected at the site.

Changes to the subsurface conditions may occur subsequent to the advice provided herein, through natural processes or through the intentional or accidental addition of contaminants. The advice is based on the information obtained or available at the time the advice is provided.

This advice is not a complete assessment of the status of the site, and it is limited to the scope of works commissioned. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the advice in the context of the additional information.

## Figures



Source: Base Image - © SIX Maps www.maps.six.nsw.gov.au, accessed 26-03-2014

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0 400 800 1,600 m			
Scale: 1:40,000			
Datum: GDA 1994 MGA Zone 56 - AHD			
A4			
A	Original Issue - R03	SE	08-11-2017
Rev	Description	Drn.	Date:

- Legend:**
- Central Precinct (133.2ha)
  - Dunheved Precinct (31.1ha)
  - CHK001/1 Audit Statement Boundary
  - Former ADI St Marys Property

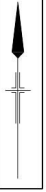
**JBS&G** Figure 1: Central Precinct Location

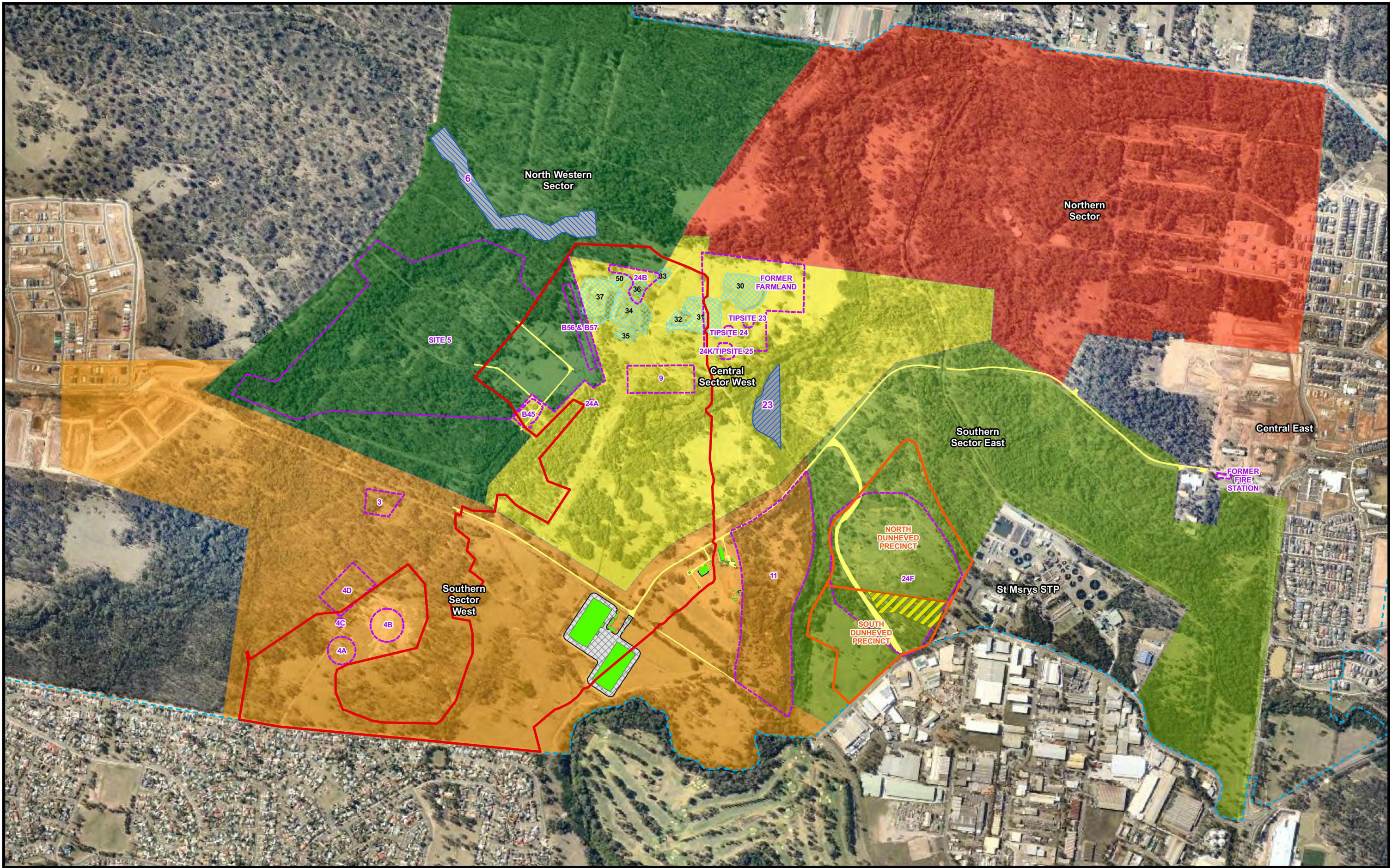
Client: Maryland Development Company

Project: Central Precinct

Job No: 43352

File Name: 43352\_01





Source: Base Image - © Near Map www.nearmap.com, imagery date 19-09-2013, accessed 24-03-2014

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0	120	240	480
Scale: 1:12,500			
Datum: GDA 1994 MGA Zone 56 - AHD			
A3			
A	Original Issue - R03	SE	18-12-2017
Rev	Description	Dm.	Date

Legend:		Former Validation Sectors	
	Central Precinct Residential Boundary		CHK001/6 Building Extent
	Dunheved Precinct		CHK001/6 Concrete Building Footprint
	CHK001/1 Audit Statement Boundary		CHK001/6 Bitumen Roads
	Former Areas of Environmental Concern (Approximate Locations)		Central Sector West
			North Western Sector
			Northern Sector
			Southern Sector East
			Southern Sector West
			Fill Area
			CHK001/7 Stockpile Footprints

Reference: Site delineation and features based on Cardno 17-11-2014: Drawing Number 89914020-SK1006 Rev 1

**JBS&G** Figure 2: Central Precinct Site Layout with CHK001/1 Site Audit Boundary and Former Validation Sectors

Client: Maryland Development Company

Project: Central Precinct

Job No: 43352 File Name: 43352\_02

## Appendix A: Site Audit Statements



NSW Environment Protection Authority  
SITE AUDIT STATEMENT (SAS)

Site Audit Statement No.: CHK001/1

Site Auditor (accredited under NSW Contaminated Land Management Act 1997):

Name: Christopher H Kidd Company: HLA-Envirosciences Pty Limited  
Address: 55-65 Grandview Street, Pymble, NSW Postcode: 2076  
Phone: (02) 9988 4422 Fax: (02) 9988 4441

Site Details

ADI St. Marys Property – excluding Eastern Sector, QEL, Site 6 and Site 23, buildings and concrete stockpile.

Address: Forrester Road, St. Marys Postcode: 2760  
Lot and DP Number: Lot 2 in DP803832  
Lot 2 and 3 in DP223888 (part of)  
Lot 3 in DP789196  
Lot 3 in DP598653  
(see attached map for excluded areas)

Local Government Area: Penrith and Blacktown

Site Audit requested by:

Name: Mr P Newton Company: Department of Urban Affairs and Planning  
Address: Sydney Region West  
Level 8, Signature Tower  
2-10 Wentworth Street  
Parramatta NSW 2150  
Phone: (02) 9895 7142 - Fax: (02) 9895 6270

Name of contact person (if different from above):

Consultancy(ies) who conducted the site investigation(s) and/or remediation:

- ADI Limited Chemical and Explosives Ordnance Investigations, Remediation and Validation 1990 - 1999
- Mackie Martin & Associates Groundwater Investigations, 1991

Title(s) of Report(s) reviewed:

1. Historical Report – St Marys Property, ADI Limited, 1996;
2. Validation Report for the Western Sector, ADI St Marys Facility, ADI Limited November 1994;
3. Validation Report for the North Western Sector of the ADI St Marys Facility, Report No. 498800, ADI Limited 1995;
4. Validation Report for the Southern Sector West of the ADI St Marys Property, Report No. 498810, ADI Limited 1996;





5. Validation Report for the Southern Sector East of the St Marys Property, Report No. 498810, ADI Limited 1996;
6. Validation Report for the Northern Sector of the ADI St Marys Property, Report No. 498820, ADI Limited 1996;
7. Validation Report for the Central Sector East of the ADI St Marys Property, Report No. 498840, ADI Limited 1997;
8. Validation Report for the Central Sector West of the ADI St Marys Property, Report No. 498840, ADI Limited 1996;
9. Validation Report for the North Eastern Sector of the ADI St Marys Property, Report No. 498850, ADI Limited 1996;
10. QA/Verification Survey Results, ADI St Marys Property, Report No. PG980323da ADI Limited, 1999.

**Other Information reviewed:**

1. Site Investigation Report of St Marys Facility Ammunition and Missiles Division, Volume 4 - Discussions and Conclusions, ADI, June 1991.
2. Remediation Action Plan for the Northern Sector, ADI St Marys Facility, Report No. 498820, ADI Limited 1996;
3. Remediation Action Plan for Central Eastern Sector, ADI St Marys Facility, Report No. 498840, ADI Limited 1996;
4. Remediation Action Plan for the Eastern Sector of the ADI St Marys Property, Report No. 498830, ADI Limited 1996;
5. Stage I Decontamination Audit, ADI St Marys CMPS&F, 1997.

**Summary Site Audit Report Title:**

Stage 2 Decontamination Audit Report for ADI Site, St Marys.

I have completed a site audit (as defined in the Contaminated Land Management Act 1997) and reviewed the reports and information referred to above with due regard to relevant laws and guidelines. I certify that the site (tick **all** appropriate boxes)

**(a) is suitable for the following use(s):**

- residential, including substantial vegetable garden and poultry;
- residential, including substantial vegetable garden, excluding poultry; *llll*
- residential with accessible soil, including garden (minimal home grown produce contributing less than 10% fruit and vegetable intake), excluding poultry; *llll*
- residential with minimal opportunity for soil access including units;
- daycare centre, preschool, primary school;
- secondary school;
- park, recreational open space, playing field;
- commercial/industrial use;
- Other *llll*



subject to

✓ Conditions

1. Excludes Eastern Sector, QEL, Site 6 and Site 23 which are covered by separate site audit statements, namely CHK001/2, CHK001/3, CHK001/4 and CHK001/5.
2. Excludes areas not yet investigated including the footprint of original buildings, car parks and roads, mainly around former Administration Centre Buildings CHK001/6) and the concrete stockpile in Central Sector West. (Stockpile CHK001/7)
3. An appropriate management plan, including procedures for the safe handling and disposal of any items of ordnance that may be found during earthworks, should be lodged prior to the commencement of development earthworks. This plan should be similar to the "Remnant Contamination Management Plan" submitted by ADI (see Appendix E of the Site Audit Report).

~~(b) is not suitable for any beneficial use due to risk of harm from contamination~~ *Luca*

(comments): *Luca*

I am accredited by the NSW Environment Protection Authority under the Contaminated Land Management Act, 1997 as a site auditor (Accreditation No. 9813).

I Certify that:

- (a) I have personally examined and am familiar with the information contained in this statement, including the reports and information referred to in this statement, and
- (b) this statement is to the best of my knowledge, true, accurate and complete, and
- (c) on the basis of my inquiries made to those individuals immediately responsible for making the reports, and obtaining the information, referred to in this statement, those reports and that information are, to the best of my knowledge, true, accurate and complete.

I am aware that there are penalties for wilfully submitting false, inaccurate or incomplete information.

Signed: *Luca*

Date: *7/6/99*

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PREPARED BY:

**Whelans**  
 Surveyors  
 Planners  
 Consulting Engineers

Whelans Australia Pty Ltd

Head Office:

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 12 Victoria Road, Parramatta  
 NSW 2150  
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 Facsimile (02) 9630 4599

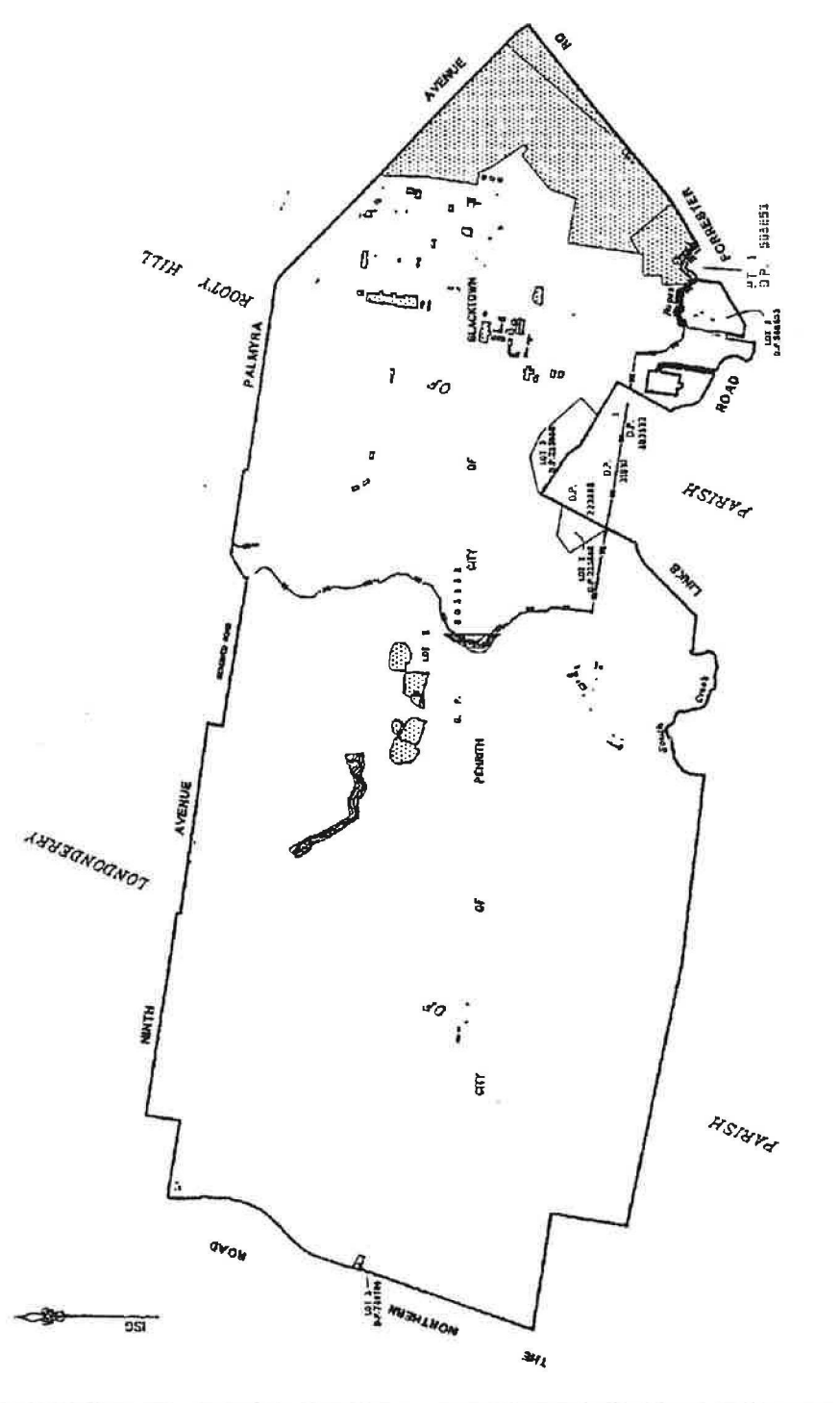
PREPARED FOR:

ADI Property

**ADI ST MARYS PROPERTY  
 PLAN TO ACCOMPANY SITE  
 AUDIT STATEMENT CHK001/1**

**A3**

ORIGINAL SIZE:			
SCALE:	HOR: 1:25,000	VERT:	
CO-ORDS:	EG	GANG:	
DATE OF SURVEY:	DATE OF PLAN: 11 May 1998		
SURVEY:		DRAWN:	AMM/AMB
CHECKED:	MTB	DATE:	24.3.1999
APPROVED:	PN	DATE:	24.3.1999
JOB REF:	8662		
CAD REF:	5467-122.DWG	SHEET:	1 OF 13 SHEETS



NOTE:  
 GEOMETRY SHOWN AS SUPPLIED BY ADI LIMITED TO DATE  
 OF ISSUE 10.3.1999  
 FOR SITE DETAILS ON EXCLUDED AREAS PLEASE REFER TO  
 DRAWINGS:

- 5467-123
- 5467-125
- 5467-126
- 5467-127
- 5467-128
- 5467-129
- 5467-130
- 5467-131
- 5467-132
- 5467-133
- 5467-134
- 5467-135

SHADED AREAS ARE EXCLUDED FROM  
 AUDIT STATEMENT CHK001/1



*Handwritten signature or initials.*





**Summary Site Audit Report Title:**

Stage 2 Decontamination Audit Report for ADI Site, St Marys.

I have completed a site audit (as defined in the Contaminated Land Management Act 1997) and reviewed the reports and information referred to above with due regard to relevant laws and guidelines. I certify that the site (tick all appropriate boxes)

(a) is suitable for the following use(s):

- residential, including substantial vegetable garden and poultry;
- residential, including substantial vegetable garden, excluding poultry; *not*
- residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry; *not*
- residential with minimal opportunity for soil access including units;
- daycare centre, preschool, primary school;
- secondary school;
- park, recreational open space, playing field;
- commercial/industrial use;
- Other *not*

subject to

- Conditions

1. Appropriate management plan including procedures for the safe handling and disposal of any items of explosive ordnance, shall be in place before development earthworks commences and shall remain in place to cover any excavation on the site during its ongoing use. This plan should be similar to the "Remnant Contamination Management Plan" submitted by ADI (see Appendix E of the Site Audit Report).
2. The final surface of any earthworks in areas which are to be used for active recreational land uses, e.g. sports grounds, school grounds and picnic areas, or low density residential use, should, on completion of the earthworks, be surveyed with a metal detector by appropriately qualified and experienced personnel, and the work reviewed by an independent site auditor.

~~(b) is not suitable for any beneficial use due to risk of harm from contamination~~ *not*  
 (comments) *not*

I am accredited by the NSW Environment Protection Authority under the Contaminated Land Management Act, 1997 as a Site Auditor (Accreditation No. 9813).



I Certify that:

- (a) I have personally examined and am familiar with the information contained in this statement,
- (b) including the reports and information referred to in this statement, and
- (c) this statement is to the best of my knowledge, true, accurate and complete, and
- (d) on the basis of my inquiries made to those individuals immediately responsible for making the reports, and obtaining the information, referred to in this statement, those reports and that information are, to the best of my knowledge, true, accurate and complete.

I am aware that there are penalties for wilfully submitting false, inaccurate or incomplete information.

Signed:  Date: 7/6/99

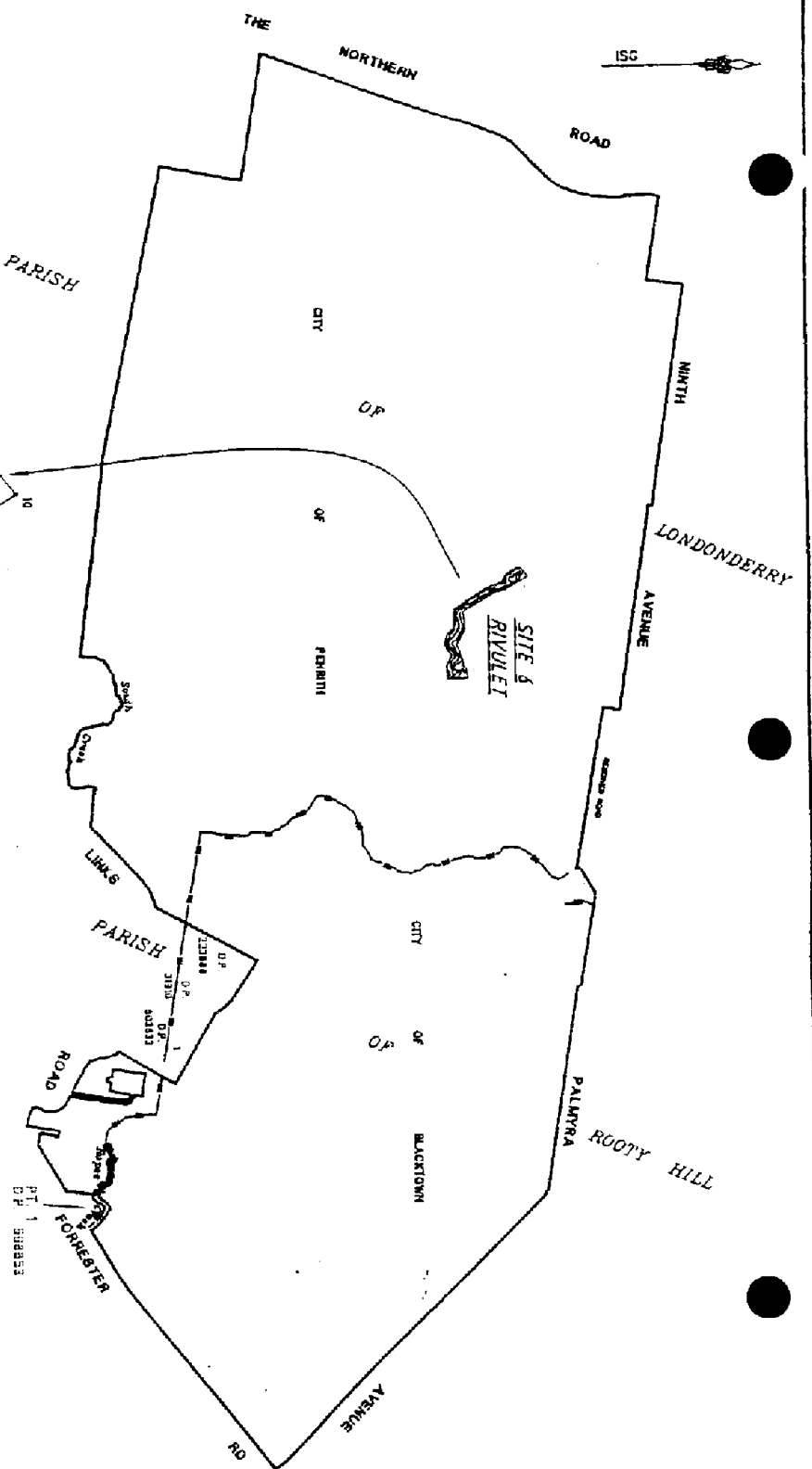
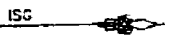
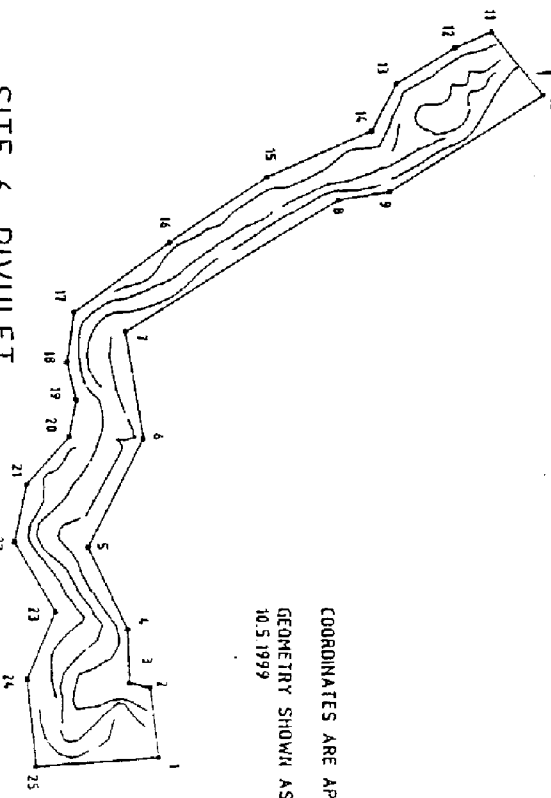


TABLE OF CO-ORDINATES

No.	EASTING	NORTHING
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2	1 216 991	1 267 034
3	1 216 987	1 267 017
4	1 216 944	1 267 016
5	1 216 879	1 266 984
6	1 216 792	1 267 030
7	1 216 700	1 267 016
8	1 216 604	1 267 191
9	1 216 598	1 267 231
10	1 216 522	1 267 310
11	1 216 470	1 267 310
12	1 216 443	1 267 282
13	1 216 512	1 267 237
14	1 216 549	1 267 211
15	1 216 588	1 267 134
16	1 216 637	1 267 051
17	1 216 692	1 266 975
18	1 216 732	1 266 975
19	1 216 762	1 266 976
20	1 216 791	1 266 959
21	1 216 828	1 266 936
22	1 216 875	1 266 926
23	1 216 930	1 266 958
24	1 216 983	1 266 935
25	1 217 051	1 266 941

SITE 6 RIVULET  
NOT TO SCALE



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GEOMETRY SHOWN AS SUPPLIED BY ADI TO OUR OFFICE  
10.5.1999

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PREPARED BY:

**Whelans**  
Whelans Australia Pty Ltd  
Structural  
Engineers  
Quantity  
Engineers

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Facsimile (02) 9630 4599

PREPARED FOR:

ADI Property

ADI ST MARYS PROPERTY  
SITE 6 RIVULET WITHIN  
REGIONAL PARK  
PLAN TO ACCOMPANY SITE  
AUDIT STATEMENT CHK001/4

**A3**

ORIGINAL SIZE	SCALE	HOB	1 : 25,000	VERT.	-
CD-0885	ISG	DATE	-	DATE OF PLAN	11 May 1999
DATE OF SURVEY	DATE	DATE	DATE	DATE	DATE
SURVEY	DATE	DATE	DATE	DATE	DATE
CHECKED: DW	DATE	DATE	DATE	DATE	DATE
APPROVED: PW	DATE	DATE	DATE	DATE	DATE
JOB REF: 9682	DATE	DATE	DATE	DATE	DATE
CAO REF: 5467-1110MC	SHEET	4	OF	13	SHEETS

**NSW Environment Protection Authority**

**SITE AUDIT STATEMENT (SAS)**

**Site Audit Statement No.:** CHK001/5

**Site auditor** (accredited under NSW Contaminated Land Management Act 1997):

**Name:** Christopher H Kidd      **Company:** HLA-Envirosiences Pty Limited  
**Address:** 55-65 Grandview Street, Pymble, NSW      **Postcode:** 2076  
**Phone:** (02) 9988 4422      **Fax:** (02) 9988 4441

**Site Details**

**ADI St. Marys Property -Site 23**  
**Address:** Forrester Road, St. Marys      **Postcode:** 2760  
**Lot and DP Number:**      **Lot 2 in DP803832 (part of)**  
      **(see attached map)**  
**Local Government Area:**      **Penrith and Blacktown**

**Site Audit requested by:**

**Name:** Mr P Newton      **Company:** Department of Urban Affairs and  
      **Planning**  
**Address:**      **Sydney Region West**  
      **Level 8, Signature Tower**  
      **2-10 Wentworth Street**  
      **Parramatta NSW 2150**  
      **Phone:** (02) 9895 7142 - **Fax:** (02) 9895 6270

**Name of contact person** (if different from above):

**Consultancy(ies)** who conducted the site investigation(s) and/or remediation:

- **ADI Limited**      **Chemical and Explosives Ordnance**  
      **Investigations, Remediation and Validation 1990-**  
      **1999**
- **Mackie Martin & Associates**      **Groundwater Investigations, 1991**

**Title(s) of Report(s)** reviewed:

1. **Historical Report – St Marys Property, ADI Limited, 1996;**
2. **Validation Report for the Central Sector West of the ADI St Marys Property, Report No. 498840, ADI Limited 1996;**
3. **QA/Verification Survey Results, ADI St Marys Property, Report No. PG980323da ADI Limited, 1999.**

**Other Information** reviewed:

- 1 **Site Investigation Report of St Marys Facility Ammunition and Missiles Division, Volume 4 – Discussions and Conclusions, ADI, June 1991.**
- 2 **Stage I Decontamination Audit, ADI St Marys CMPS&F, 1997.**



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PREPARED BY:

**Whelans**

Surveyors  
Planners  
Geomatic Engineers

**Whelans Australia Pty Ltd**

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NSW 2150  
Telephone (02) 9630 4199  
Facsimile (02) 9630 4599

PREPARED FOR:

**ADI Property**

**ADI ST MARYS PROPERTY  
SITE 23 WITHIN REGIONAL PARK.**

**PLAN TO ACCOMPANY SITE AUDIT  
STATEMENT CHK001/5**

ORIGINAL SIZE: **A3**

SCALE: HOR: 1 : 25,000 VERT: -

CO-ORDS: ICG DATUM: -

DATE OF SURVEY: - DATE OF PLAN: 11 May 1999

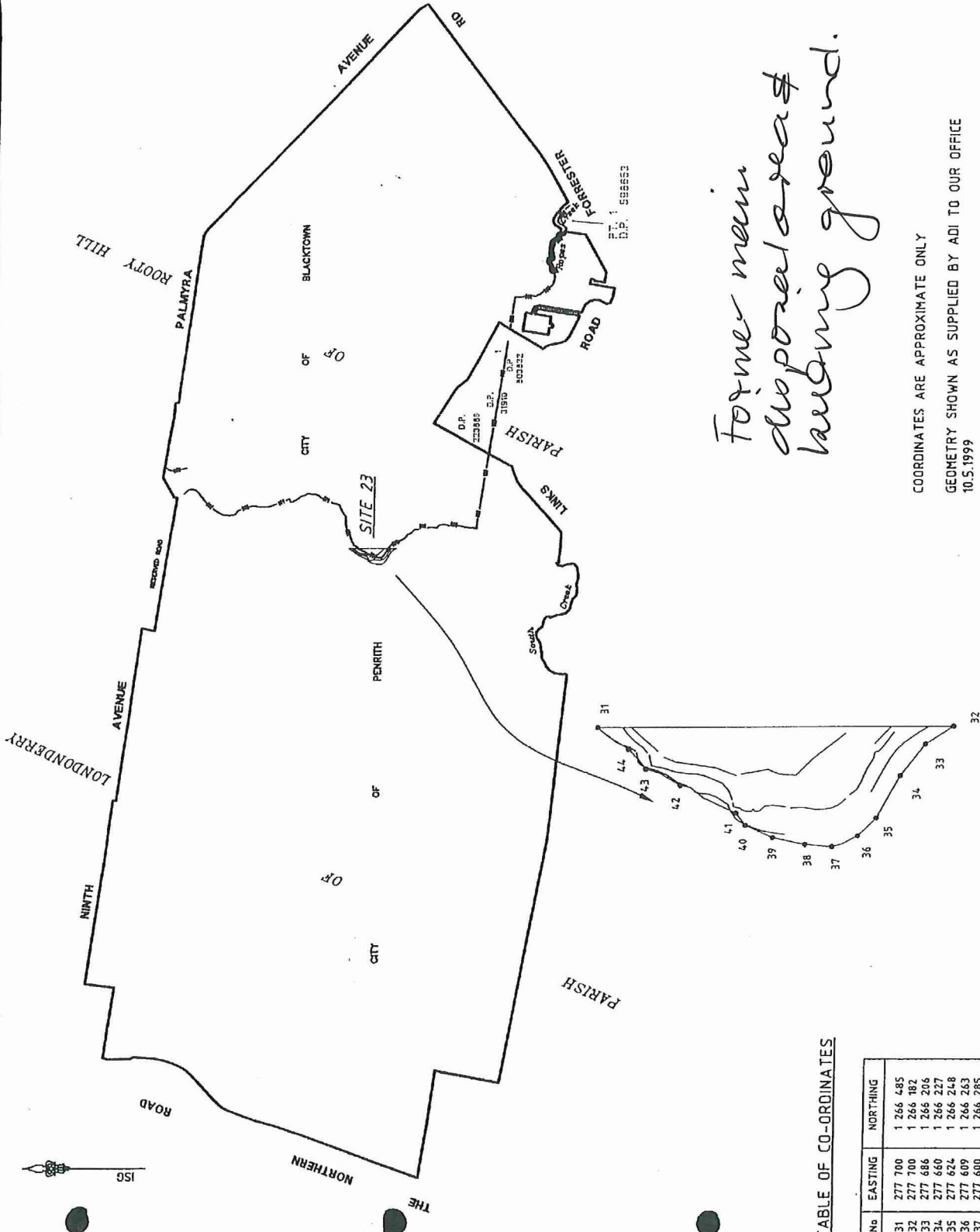
SURVEY: - DRAWN: Acad/DDW

CHECKED: DOW DATE: 24.5.1999

APPROVED: PW DATE: 24.5.1999

JOB REF: 8662

CAD REF: 5467-132/DWG SHEET 3 OF 13 SHEETS



*Former main  
dipping area &  
landring ground.*

COORDINATES ARE APPROXIMATE ONLY  
GEOMETRY SHOWN AS SUPPLIED BY ADI TO OUR OFFICE  
10.5.1999

**SITE 23**

NOT TO SCALE

TABLE OF CO-ORDINATES

No	EASTING	NORTHING
31	277 700	1 266 485
32	277 700	1 266 182
33	277 686	1 266 205
34	277 660	1 266 227
35	277 624	1 266 248
36	277 609	1 266 263
37	277 600	1 266 285
38	277 602	1 266 308
39	277 608	1 266 336
40	277 618	1 266 359
41	277 629	1 266 367
42	277 652	1 266 414
43	277 666	1 266 444
44	277 682	1 266 458



NSW Environment Protection Authority  
SITE AUDIT STATEMENT (SAS)

Site Audit Statement No.: CHK001/6

Site Auditor (accredited under NSW Contaminated Land Management Act 1997):

Name: Christopher H Kidd Company: HLA-Envirosciences Pty Limited  
Address: 55-65 Grandview Street, Fybble, NSW Postcode: 2076  
Phone: (02) 9988 4422 Fax: (02) 9988 4441

Site Details

ADI St. Marys Property – existing buildings and paved areas scattered about the site.  
Address: Forrester Road, St. Marys Postcode: 2760  
Lot and DP Number: Lot 2 in DP803832  
Lot 2 and 3 in DP223888 (part of)  
Lot 3 in DP789196  
Lot 3 in DP598653  
(see attached 7 maps)  
Local Government Area: Penrith and Blacktown

Site Audit requested by:

Name: Mr P Newton Company: Department of Urban Affairs and  
Planning  
Address: Sydney Region West  
Level 8, Signature Tower  
2-10 Wentworth Street  
Parramatta NSW 2150  
Phone: (02) 9895 7142 - Fax: (02) 9895 6270

Name of contact person (if different from above):

Consultancy(ies) who conducted the site investigation(s) and/or remediation:

- ADI Limited Chemical and Explosives Ordnance  
Investigations, Remediation and Validation 1990 -  
1999
- Mackie Martin & Associates Groundwater Investigations, 1991

Title(s) of Report(s) reviewed:

11. Historical Report – St Marys Property, ADI Limited, 1996;
12. Validation Report for the Western Sector, ADI St Marys Facility, ADI Limited  
November 1994;
13. Validation Report for the North Western Sector of the ADI St Marys Facility, Report No.  
498300, ADI Limited 1995;
14. Validation Report for the Southern Sector West of the ADI St Marys Property, Report  
No. 498310, ADI Limited 1996;

15. Validation Report for the Southern Sector East of the St Marys Property, Report No. 498810, ADI Limited 1996;
16. Validation Report for the Northern Sector of the ADI St Marys Property, Report No. 498820, ADI Limited 1996;
17. Validation Report for the Central Sector East of the ADI St Marys Property, Report No. 498840, ADI Limited 1997;
18. Validation Report for the Central Sector West of the ADI St Marys Property, Report No. 498840, ADI Limited 1996;
19. Validation Report for the North Eastern Sector of the ADI St Marys Property, Report No. 498850, ADI Limited 1996;
20. QA/Verification Survey Results, ADI St Marys Property, Report No. PG980323da ADI Limited, 1999.

**Other Information reviewed:**

6. Site Investigation Report of St Marys Facility Ammunition and Missiles Division, Volume 4 – Discussions and Conclusions, ADI, June 1991.
7. Remediation Action Plan for the Northern Sector, ADI St Marys Facility, Report No. 498820, ADI Limited 1996;
8. Remediation Action Plan for Central Eastern Sector, ADI St Marys Facility, Report No. 498840, ADI Limited 1996;
9. Remediation Action Plan for the Eastern Sector of the ADI St Marys Property, Report No. 498830, ADI Limited 1996;
10. Stage I Decontamination Audit, ADI St Marys CMPS&F, 1997.

**Summary Site Audit Report Title:**

Stage 2 Decontamination Audit Report for ADI Site, St Marys.

I have completed a site audit (as defined in the Contaminated Land Management Act 1997) and reviewed the reports and information referred to above with due regard to relevant laws and guidelines. I certify that the site (tick all appropriate boxes)

**(a) is suitable for the following use(s):**

- residential, including substantial vegetable garden and poultry; *msk*
- residential, including substantial vegetable garden, excluding poultry; *msk*
- residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry; *msk*
- residential with minimal opportunity for soil access including units; *msk*
- day care centre, preschool, primary school; *msk*
- secondary school; *msk*
- park, recreational open space, playing field; *msk*
- commercial/industrial use;
- Other – May continue to be used for existing commercial use and carparks, but underlying soils need to be tested for chemical and ordnance contamination after demolition.

subject to

✓ Conditions

1. Soils under existing buildings, car parks, roads and the concrete stockpile shall be tested for ordnance and/or chemical contamination when these facilities are removed; site audits statements for these areas will also be required.
2. An appropriate management plan, including procedures for the safe handling and disposal of any items of ordnance that may be found during earthworks, should be lodged prior to the commencement of development earthworks. This plan should be similar to the "Remnant Contamination Management Plan" submitted by ADI (see Appendix E of the Site Audit Report).

~~(b) is not suitable for any beneficial use due to risk of harm from contamination~~  
 (comments) *per*

I am accredited by the NSW Environment Protection Authority under the Contaminated Land Management Act, 1997 as a Site Auditor (Accreditation No. 9813).

I Certify that:

- (a) I have personally examined and am familiar with the information contained in this statement, including the reports and information referred to in this statement, and
- (b) this statement is to the best of my knowledge, true, accurate and complete, and
- (c) on the basis of my inquiries made to those individuals immediately responsible for making the reports, and obtaining the information, referred to in this statement, those reports and that information are, to the best of my knowledge, true, accurate and complete.

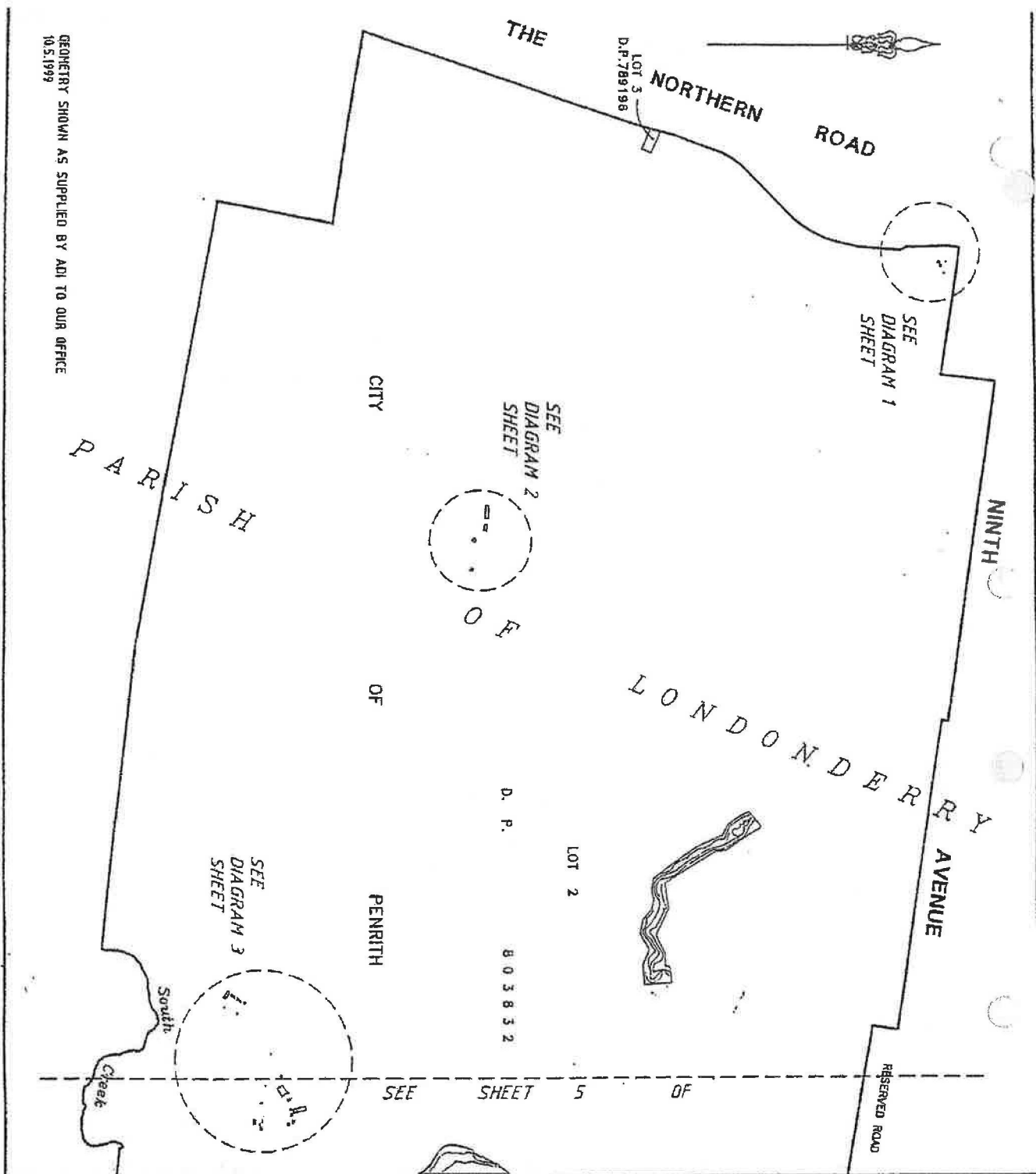
I am aware that there are penalties for wilfully submitting false, inaccurate or incomplete information.

Signed: \_\_\_\_\_

Date: \_\_\_\_\_

*Lawson*

7/6/99



GEOMETRY SHOWN AS SUPPLIED BY ADI TO OUR OFFICE  
10.5.1999

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PREPARED BY:

**Whelans** SURVEYING  
CONSULTING ENGINEERING

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PREPARED FOR:

**ADI PROPERTY**

ADI ST MARYS PROPERTY  
 RETAINED BUILDINGS/PAVED AREA  
 PLAN TO ACCOMPANY SITE AUDIT  
 STATEMENT CHK001/6

ORIGINAL SIZE:	VERT:	<b>A3</b>
SCALE: 1:12500	DATE:	
CO-ORDS:	DATE OF PLOT:	19 MAY 1995
DATE OF SURVEY:	DATE:	
SURVEY:	DRAWN:	DDW
CHECKED:	DATE:	24.5.1995
APPROVED:	DATE:	24.5.1999
JOB REF: 4462		
CAD REF: 4462-126		SHEET 7 OF 13 SHEETS

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PREPARED BY:

**Whelans**  
 Surveyors  
 Planners  
 Geomatics Engineers  
**Whelans Australia Pty Ltd**

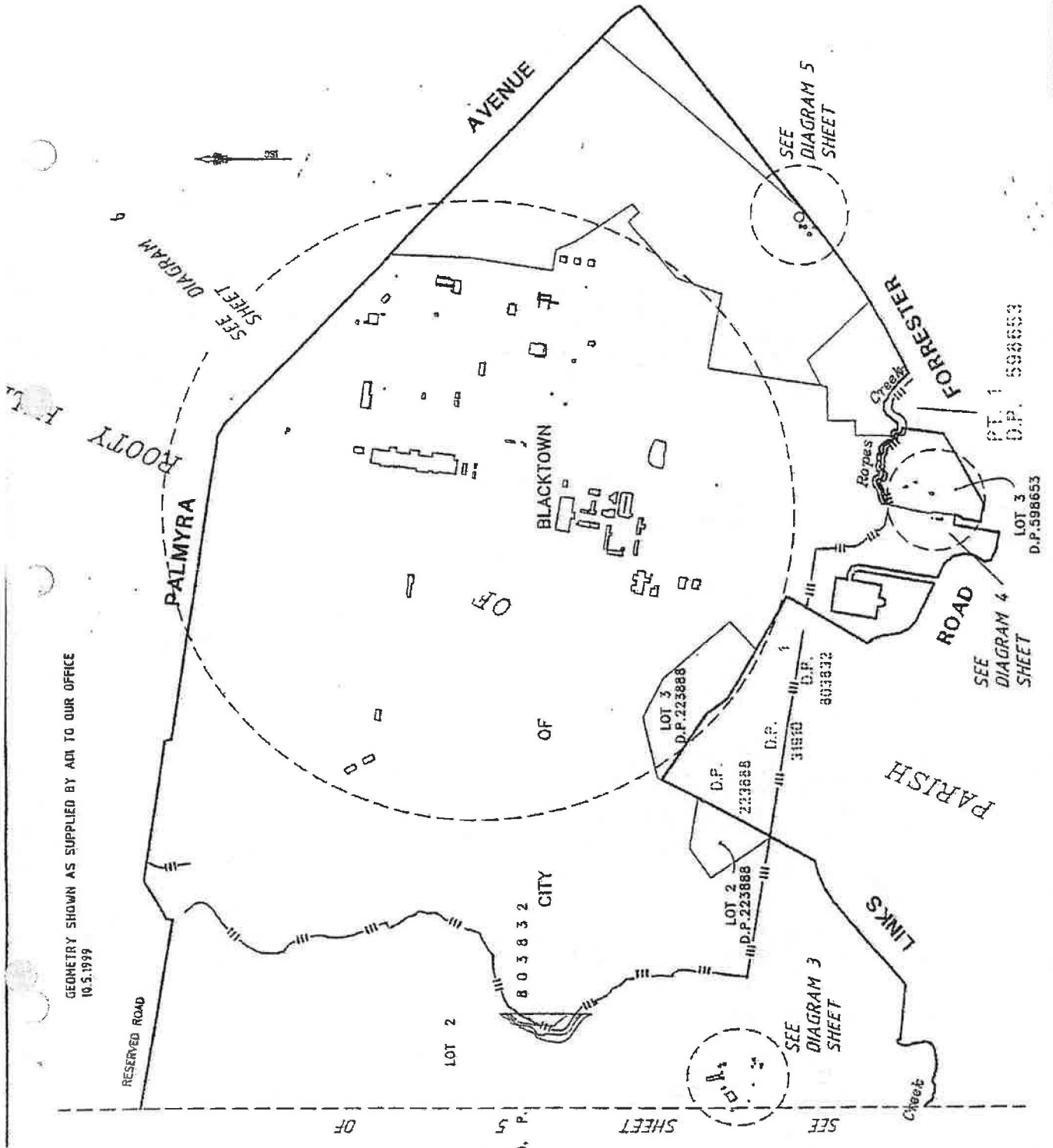
**Head Office:**  
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 Sydney, New South Wales  
 2000 Australia  
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 Facsimile (02) 9261 5012

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PREPARED FOR:

**ADI PROPERTY**  
**ADI ST MARYS PROPERTY**  
**RETAINED BUILDINGS/PAVED AREA**  
**PLAN TO ACCOMPANY SITE AUDIT**  
**STATEMENT CHK001/6**

ORIGINAL SIZE:	<b>A3</b>
SCALE:	HORI: 1:2500 VERT: DATUM:
CD-ORGS:	DATE OF PLAN: 19 MAY 1999
DATE OF SURVEY:	
SURVEY:	GNANH DOW
CHECKED:	DOW DATE 24.5.1999
APPROVED:	PH DATE 24.5.1999
JOB REF:	8662
CAD REF:	5487-123
	SHEET 6 OF 13 SHEETS



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 10.5.1999

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PREPARED BY:

**Whelans**  
 SURVEYOR  
 Electrical Engineering  
 Mechanical Engineering

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 Facsimile (02) 9630 4599

PREPARED FOR:

**ADI PROPERTY**

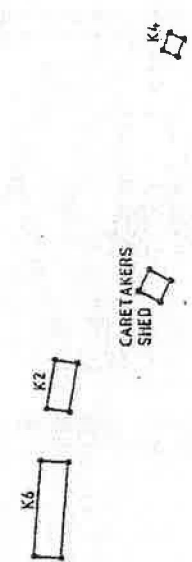
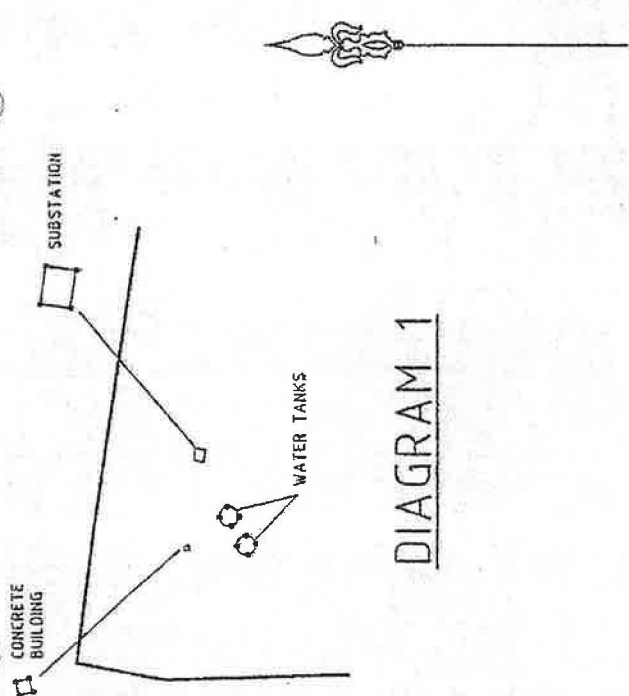
ADI ST MARYS PROPERTY  
 RETAINED BUILDINGS/PAVED AREA  
 PLAN TO ACCOMPANY SITE AUDIT  
 STATEMENT CHK001/6

**A3**

ORIGINAL SIZE	VERT.
SCALE	HORZ. 2000
CO-ORDS.	BATHY.
DATE OF SURVEY	DATE OF PLAN: MAY 1999
SURVEY	DRAWN: DOW
CHECKED: DOW	DATE: 21.5.1999
APPROVED: PH	DATE: 21.5.1999
JOB REF: 8862	
CAD REF: 5487-127	SHEET 8 OF 13 SHEETS

CONCRETE BUILDING	274588 1267987 274590 1267987 274590 1267985 274588 1267985
SUBSTATION	274625 1267979 274626 1267983 274631 1267982 274630 1267978
WATERTANK	274606 1267968 274603 1267964 274598 1267968 274602 1267972
WATERTANK	274589 1267965 274586 1267960 274591 1267957 274594 1267960
K6	275465 1266407 275425 1266410 275426 1266422 275466 1266419
K2	275507 1266403 275487 1266407 275488 1266416 275508 1266413
CARETAKERS SHED	275532 1266368 275537 1266377 275546 1266373 275541 1266364
K4	275642 1266357 275635 1266360 275637 1266367 275645 1266364

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 10.5.1999



**DIAGRAM 2**

*pull*

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PREPARED BY:



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PREPARED FOR:

**ADI PROPERTY**

**ADI ST MARYS PROPERTY  
 RETAINED BUILDINGS & PAVED AREA  
 PLAN TO ACCOMPANY SITE  
 AUDIT STATEMENT CHK0016 (Rev. 1)**

**A3**

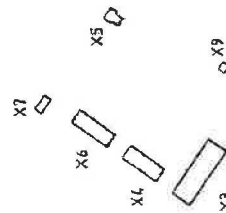
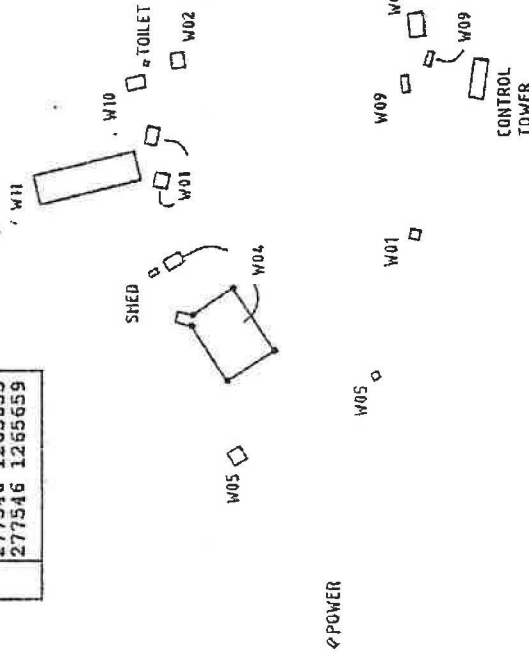
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	DATE OF SURVEY:	MAY 1999	
	DATE:	31.5.1999	
	DATE:	24.5.1999	
	CAD REF:	5467-128	
	SHEET 10 OF 13 SHEETS		

BDG No	EASTING	NORTHING
W09	277529	1265648
	277530	1265651
	277524	1265652
	277524	1265650
W02	277513	1265658
	277513	1265661
	277520	1265662
	277520	1265659
W01	277453	1265658
	277511	1265634
	277527	1265632
	277526	1265626
W05	277536	1265658
	277536	1265652
	277546	1265653
	277546	1265659

BDG No	EASTING	NORTHING
TOILET	277519	1265773
	277521	1265766
	277516	1265765
	277514	1265772
POWER	277283	1265688
	277285	1265686
	277287	1265689
	277286	1265691
W11	277477	1265767
	277468	1265809
	277480	1265811
	277489	1265770
SHED	277439	1265759
	277437	1265763
	277439	1265764
	277441	1265761
CONTROL TOWER	277453	1265658
	277511	1265634
	277527	1265632
	277526	1265626

BDG No	EASTING	NORTHING
W01	277452	1265655
	277456	1265654
	277457	1265658
	277453	1265658
W04	277475	1265762
	277481	1265760
	277479	1265755
	277474	1265756
W06	277493	1265765
	277500	1265764
	277499	1265759
	277492	1265760
W07	277433	1265729
	277407	1265712
	277395	1265731
	277418	1265746
W08	277444	1265749
	277440	1265753
	277444	1265758
	277448	1265751
W05	277399	1265671
	277397	1265674
	277395	1265672
	277396	1265670
W03	277360	1265728
	277365	1265731
	277368	1265726
	277363	1265723

BDG No	EASTING	NORTHING
X1	277113	1265596
	277111	1265594
	277105	1265598
	277107	1265601
X6	277106	1265581
	277101	1265585
	277091	1265570
	277096	1265566
X4	277076	1265549
	277082	1265545
	277091	1265559
	277086	1265563
X3	277067	1265535
	277072	1265542
	277094	1265527
	277089	1265520
X9	277127	1265521
	277125	1265518
	277122	1265520
	277124	1265523
X5	277142	1265565
	277145	1265563
	277150	1265568
	277145	1265571



**DIAGRAM 3**

*Handwritten mark*



NOTES:

**Whelans Australia Pty Ltd.**  
 SURVEYORS  
 Geomatics Engineers

**Whelans Australia Pty Ltd**

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 Facsimile 02) 9630 4593

PREPARED BY:  
**Whelans Australia Pty Ltd**

ORIGINAL SIZE: **A3**

SCALE: HOR: 2000 VERT: 2000

DATE OF SURVEY: MAY 1999

DRAWN: ACAD/DGM

CHECKED: DOW DATE: 24.5.1999

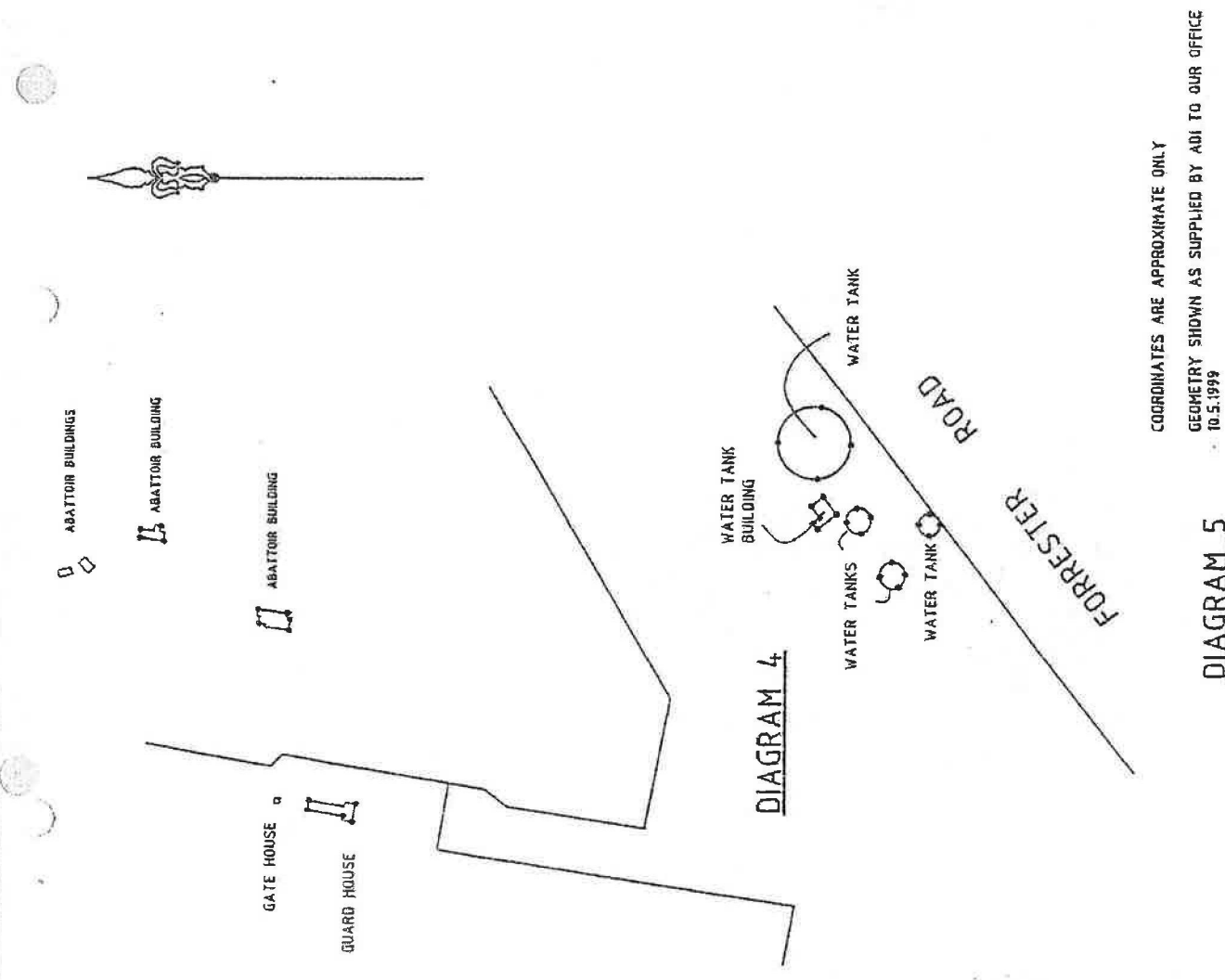
APPROVED: PY DATE: 24.5.1999

JOB REF: 862

CAD REF: 5467-129

SHEET 11 OF 13 SHEETS

BUG NO	EASTING	NORTHING
WATER TANK BUILDING	280345 1265484	280349 1265492
	280351 1265494	280354 1265491
	280359 1265495	
	280389 1265510	280403 1265494
	280385 1265477	280371 1265496
	280357 1265477	280358 1265474
	280350 1265468	280347 1265475
	280326 1265452	
	280372 1265458	
	280334 1265459	
	280330 1265444	
	280354 1265445	
	280356 1265441	
	280347 1265444	
	280349 1265436	
GATE HOUSE	279372 1265033	279375 1265032
	279372 1265030	279374 1265030
	279369 1265017	279374 1265016
	279372 1264995	279364 1264997
	279366 1265001	
	279459 1265041	279453 1265040
	279450 1265027	279454 1265026
	279457 1265027	279491 1265094
	279495 1265093	279489 1265083
	279496 1265084	
	279473 1265130	279476 1265131
	279478 1265125	279475 1265124
	279475 1265117	279480 1265121
	279482 1265118	279478 1265114
	-279470	



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PREPARED FOR:  
**ADI PROPERTY**  
**ADI ST MARYS PROPERTY**  
**RETAINED BUILDINGS/PAVED AREA**  
**PLAN TO ACCOMPANY SITE AUDIT**  
**STATEMENT CHK001/6**

ORIGINAL SIZE:	A3
SCALE:	NONE
CD-0805:	6090
DATE OF SURVEY:	10.5.1999
DATE OF PLAN:	MAY 1999
DRAWN:	ACD/GDW
CHECKED:	DNW
DATE:	24.5.1999
APPROVED:	PNV
DATE:	24.5.1999
JOB REF:	6692
SHEET:	12 OF 13 SHEETS

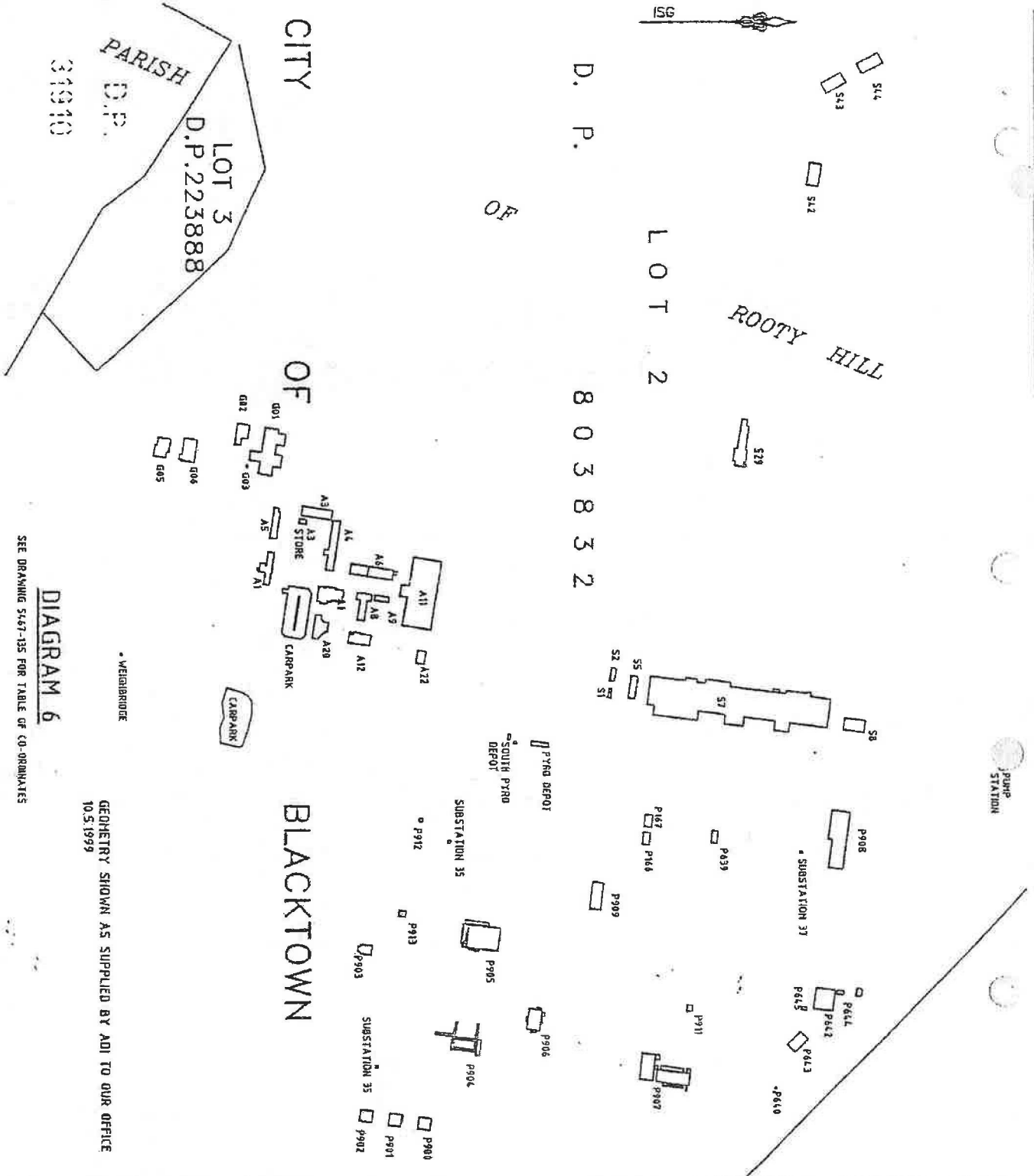


DIAGRAM 6

SEE DRAWING 5467-135 FOR TABLE OF CO-ORDINATES

GEOMETRY SHOWN AS SUPPLIED BY ADI TO OUR OFFICE  
 10.5.1999

BODG NO	EASTING NORTHING
A11	279334 1266754 279340 1266297 279448 1265929 279442 1266227
A22	279484 1266274 279303 1266270 279482 1266261
A9	279398 1266217 279406 1266217 279403 1266194 279394 1266195
A8	279394 1266191 279435 1266178 279402 1266172 279390 1266168
A6	279344 1266158 279359 1266155 279370 1266222 279354 1266224
A4	279274 1266141 279274 1266129 279353 1266117 279355 1266128
A3	279268 1266138 279274 1266126 279266 1266077 279252 1266079
A3 STORE	279273 1266086 279271 1266074 279281 1266086 279279 1266078 279302 1266076 279304 1266077 279284 1266043 279284 1266033
A5	279324 1266023 279324 1266023 279357 1266017 279342 1266010
A1	279380 1266107 279404 1266108 279409 1266143 279387 1266146
A22	279454 1266162 279455 1266155 279470 1266153 279475 1266187
A12	279428 1266100 279462 1266094 279453 1266119 279437 1266113

BODG NO	EASTING NORTHING
A11	279567 1265996 279556 1265990 279542 1265925 279567 1265945 279606 1265940 279631 1265942 279640 1265925 279659 1265990
A22	279591 1266093 279384 1266089 279379 1266086 279383 1266046 279433 1266044 279454 1266076
A9	279203 1266029 279200 1266006 279178 1265991 279156 1266026 279138 1266052
A8	279144 1265979 279145 1265960 279122 1265992 279119 1265972 279133 1265966
A6	279122 1265981 279114 1265930 279162 1265987 279177 1265971
A4	279174 1266058 279171 1266029 279141 1266088 279144 1266084
A3	279257 1267007 279251 1266998 279259 1266966 279254 1266974
A5	279258 1266936 279260 1266949 279244 1266939 279252 1266907
A1	279279 1266984 279277 1266903 279266 1266909 279263 1266890
A7	279324 1266023 279322 1266025 279377 1266023 279376 1266015
A22	279618 1266973 279618 1266941 279596 1266944 279600 1266978
A12	279564 1266923 279611 1266916 279588 1266933

BODG NO	EASTING NORTHING
A11	279525 1266609 279524 1266592 279560 1266592 279561 1266604
A22	279533 1266570 279511 1266565 279531 1266562
A9	279192 1266788 279189 1266769 279114 1266781 279115 1266791
A8	279599 1266565 279580 1266465 279575 1266465 279605 1266652
A6	279750 1266952 279746 1266923 279837 1266917 279840 1266939
A4	279910 1266872 279814 1266872 279814 1266876
A3	279859 1266784 279608 1266782 279604 1266751 279589 1266753
A1	279772 1266631 279770 1266618 279752 1266621 279755 1266634
A7	279759 1266627 279798 1266615 279779 1266617 279781 1266630
A12	279860 1266552 279858 1266533 279900 1266528 279902 1266546
A22	280251 1266231 280232 1266234 280229 1266215 280248 1266212
A1	280245 1266186 280242 1266167 280223 1266170 280226 1266189
A7	279973 1266187 279959 1266189 279971 1266170 279957 1266172

BODG NO	EASTING NORTHING
A11	280151 1266194 280155 1266193 280156 1266192 280152 1266198
A22	279792 1266310 279792 1266311 279796 1266310 279796 1266306
A9	279910 1266231 279902 1266231 279903 1266241 279913 1266240
A8	279763 1266268 279763 1266262 279757 1266263 279759 1266268
A6	280135 1266382 280105 1266371 280125 1266309
A4	279931 1266385 279967 1266380 279924 1266329 279960 1266327
A3	280063 1266452 280096 1266448 280093 1266427 280060 1266431
A1	280186 1266690 280135 1266656 280178 1266637 280178 1266637
A7	280135 1266636 280177 1266631 280174 1266609 280165 1266681
A12	280056 1266658 280066 1266657 280065 1266667 280055 1266689
A22	280192 1266831 280190 1266832 280189 1266831 280190 1266829
A1	280063 1266923 280032 1266927 280028 1266896 280058 1266892
A7	280111 1266983 280113 1266982 280130 1266982 280099 1266970
A12	280039 1266939 280034 1266930 280040 1266940 280040 1266939
A22	280041 1266958 280039 1266960 280030 1266966 280031 1266966

BODG NO	EASTING NORTHING
A11	280059 1266871 280060 1266880 280065 1266880 279799 1266627
A22	279634 1266465 279630 1266436 279637 1266435 279641 1266468
A9	279634 1266408 279631 1266408 279631 1266413 279635 1266412
A8	279619 1266399 279628 1266396 279629 1266402 279619 1266404
A6	279487 1265773 279484 1265774 279485 1265777 279488 1265776

COORDINATES ARE APPROXIMATE ONLY

ADJ ST MARYS PROPERTY  
RETAINED BUILDINGS/PAVED AREA  
PLAN TO ACCOMPANY SITE AUDIT  
STATEMENT CHK001/6

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ORIGINAL SIZE: A3  
SCALE: NONE  
CO-ORDS: DATE: DATE OF PLAN: MAY 1999  
DATE OF SURVEY: DRAWN: ACAD/OWH  
CHECKED: OWH DATE: 24.5.1998  
APPROVED: PW DATE: 24.5.1998  
JOB REF: 9632  
C/D REF: 5467-135 SHEET 13 OF 13 SHEETS

NOTES:

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TABLE OF CO-ORDINATES OF RETAINED BUILDINGS AND PAVED AREA



**Other Information reviewed:**

- 3 Site Investigation Report of St Marys Facility Ammunition and Missiles Division, Volume 4 – Discussions and Conclusions, ADI, June 1991.
- 4 Stage I Decontamination Audit, ADI St Marys CMPS&F, 1997.

**Summary Site Audit Report Title:**

Stage 2 Decontamination Audit Report for ADI Site, St Marys.

I have completed a site audit (as defined in the Contaminated Land Management Act 1997) and reviewed the reports and information referred to above with due regard to relevant laws and guidelines. I certify that the site (tick all appropriate boxes)

**(a) is suitable for the following use(s):**

- residential, including substantial vegetable garden and poultry;
- residential, including substantial vegetable garden, excluding poultry;
- residential with accessible soil, including garden (minimal home grown produce contributing less than 10% fruit and vegetable intake), excluding poultry;
- residential with minimal opportunity for soil access including units;
- daycare centre, preschool, primary school;
- secondary school;
- park, recreational open space, playing field;
- commercial/industrial use;
- Other – May continue to be used as stockpile for crushed concrete, but underlying soils need to be tested for chemical and ordnance contamination after stockpile removed.

subject to

- Conditions

- 1. On removal of all or part of the stockpile the underlying ground should be tested for both chemical and ordnance contamination. The testing should follow similar methods and levels of quality assurance as other parts of the ADI St Marys site. Appropriate remediation and validation should be performed (if necessary) the work reviewed by a site auditor.
- 3. Appropriate management plan including procedures for the safe handling and disposal of any items of explosive ordnance, shall be in place before development earthworks commences and shall remain in place to cover any excavation on the site during its ongoing use. This plan should be similar to the "Remnant Contamination Management Plan" submitted by ADI (see Appendix E of the Site Audit Report).
- 4. The final surface of any earthworks in areas which are to be used for active recreational land uses, e.g. sports grounds, school grounds and picnic areas, or low density residential use, should, on completion of the earthworks, be surveyed with a metal detector by appropriately qualified and experienced personnel and the work reviewed by an independent site auditor.

~~(c) is not suitable for any beneficial use due to risk of harm from contamination~~

(comments): .....

*1.12.11*

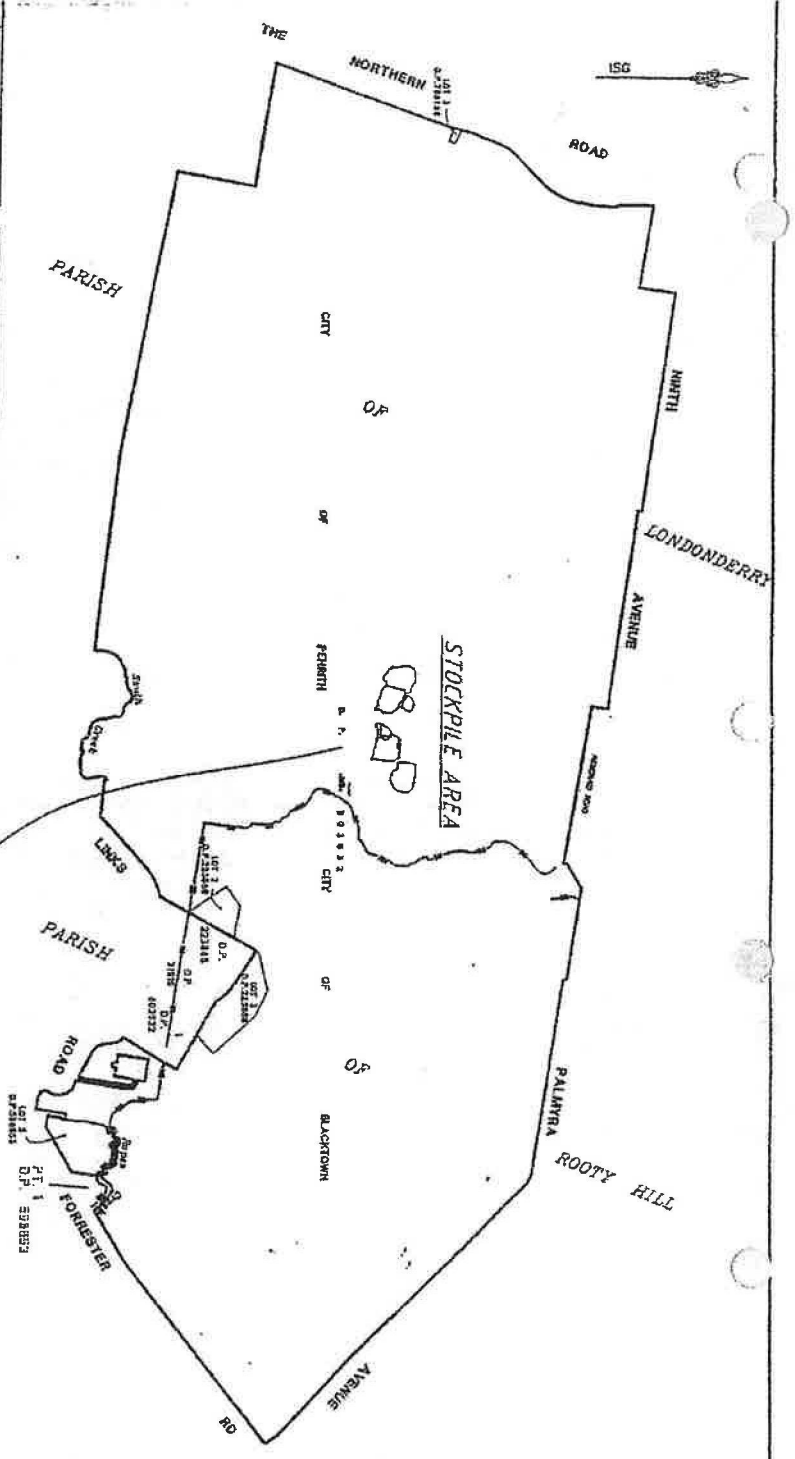
I am accredited by the NSW Environment Protection Authority under the Contaminated Land Management Act, 1997 as a Site Auditor (Accreditation No. 9813).

**I Certify that:**

- (g) I have personally examined and am familiar with the information contained in this statement, including the reports and information referred to in this statement, and
- (h) this statement is to the best of my knowledge, true, accurate and complete, and
- (i) on the basis of my inquiries made to those individuals immediately responsible for making the reports, and obtaining the information, referred to in this statement, those reports and that information are, to the best of my knowledge, true, accurate and complete.

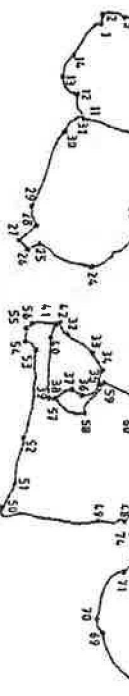
I am aware that there are penalties for wilfully submitting false, inaccurate or incomplete information.

Signed:  Date: 7/6/99



No	EASTING	NORTHING
41	277 584	1 266 725
42	277 584	1 266 727
43	277 516	1 266 793
44	277 530	1 266 791
45	277 530	1 266 792
46	277 518	1 266 791
47	277 452	1 266 766
48	277 455	1 266 770
49	277 683	1 266 670
50	277 590	1 266 684
51	277 514	1 266 691
52	277 526	1 266 700
53	277 526	1 266 701
54	277 504	1 266 699
55	277 499	1 266 716

No	EASTING	NORTHING
31	277 099	1 266 442
32	277 109	1 266 432
33	277 326	1 266 457
34	277 344	1 266 448
35	277 358	1 266 444
36	277 368	1 266 447
37	277 362	1 266 456
38	277 371	1 266 461
39	277 312	1 266 413
40	277 312	1 266 410
41	277 289	1 266 420
42	277 298	1 266 424
43	277 298	1 266 424
44	277 305	1 266 419
45	277 305	1 266 419
46	277 305	1 266 419
47	277 439	1 266 706
48	277 439	1 266 706
49	277 432	1 266 644
50	277 456	1 266 567
51	277 456	1 266 581
52	277 456	1 266 588
53	277 324	1 266 600
54	277 315	1 266 599
55	277 303	1 266 598
56	277 297	1 266 598
57	277 371	1 266 613
58	277 315	1 266 650
59	277 354	1 266 670
60	277 400	1 266 703



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 10.5.1999

STOCKPILE AREA  
 NOT TO SCALE

NOTES:

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PROJECT: ADI Property, ADI ST MARYS PROPERTY, STOCKPILE AREA, PLAN TO ACCOMPANY SITE AUDIT STATEMENT CHK001/7

ORIGINAL SIZE: A3

SCALE: 1 : 25,000

CO-ORDINATE: ISG

DATE OF SURVEY: 11 May 1999

SURVEY: DRAWN: KAD/OW

CHECKED: DOW DATE: 24.5.1999

APPROVED: PW DATE: 24.5.1999

JOB REF: 8802

CAD REF: 5407-111090

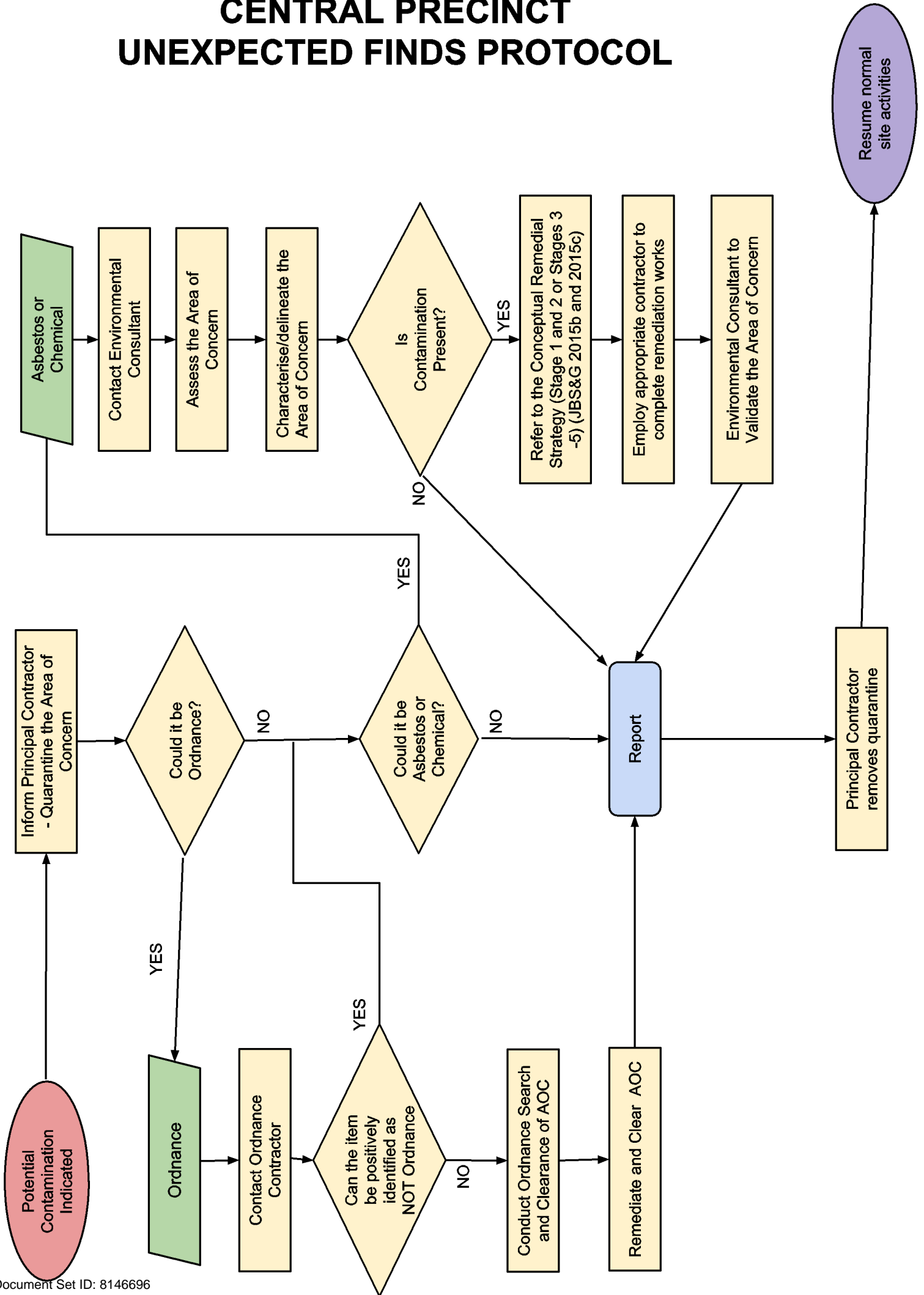
SHEET 9 OF 13 SHEETS

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## Appendix B: Unexpected Finds Protocol



# CENTRAL PRECINCT UNEXPECTED FINDS PROTOCOL



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A	Sahani Gunatunge and Katie Linz	Kellie Guenther	Kellie Guenther	Draft for review	25/02/2015
B	Sahani Gunatunge and Katie Linz	Kellie Guenther	Kellie Guenther	Final Draft for Review	5 March 2015
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