

ARMIDALE REGIONAL LANDFILL Environmental Assessment



Preliminary Contaminated Site Investigation

Lot 1 DP 253346 and 2 DP 253346 and (County of Sandon, Parish of Gara) located on Gara Road, Armidale, NSW



by

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Prepared for

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Executive Summary

This report presents the findings of a Preliminary Contaminated Site Investigation (PCSI) undertaken by E.A. Systems Pty Limited (EAS) of Lot 1 DP 253346 and Lot 2 DP 253346 (County of Sandon, Parish of Gara) located on Gara Road, Armidale, NSW.

The scope of work included the following:

- A site history review and site visit to identify potential areas of environmental concern (AECs) and chemicals of concern (CoCs); and
- Assessment of site contamination based on the site history review and site visit.

The information obtained from the site history review and site inspection can be summarised as follows:

- The registered owners of Lot 1 DP 253346 "*Edington*" are Kenneth Paul Waters and Deirdre Antoinette Waters.
- The registered owners of Lot 2 DP 253346 "*Sherraloy*" are Derry Wallace Crisp and Gail Margaret Crisp.
- The subject lots have been used for grazing.
- A small quarry is in operation in Lot 2 DP 253346, this quarry is used for extracting gravel.
- Sheep yards are located in Lot 1 DP 253346. Two empty 200 litre (44 gallon) drums were located near the yards.
- There was no permanent infrastructure present in or near the sheep yards that would have allowed for sheep dipping or fixed hose jetting.

Based on the site history review and site inspection, it is considered that:

- There is no evidence of oil spills or stains from the use of heavy vehicles in the quarry area.
- No dangerous goods or explosives were used in the quarry.
- No chemicals of concern have been used for gravel extraction.
- There is no evidence of either contaminated or clean earth fill material (acquired from another site) present on the site.
- There is no evidence of old rubbish tips on the site.
- The onsite sewage system connected in 1991 for the residence on Lot 2 DP 253346 is outside the proposed landfill site boundary (approximately 300 m down slope on the other side of a ridge) and is therefore unlikely to be a source of potential contamination for the site.
- There may be areas in and around the sheep yards that have been exposed to chemicals associated with routine sheep drenching, jetting and vaccination. However as there is no permanent infrastructure present that would have allowed dipping or fixed hose jetting, therefore any contamination would be low and limited to localised surface stains.
- The overall potential for the site to be contaminated is low.

Table of Contents

Doci	ument	Status Record	i
Exec	cutive	Summary	ii
Tab	le of C	Contents	iii
1.	Intr	oduction	1
	1.1	General	1
	1.2	Objectives and Scope of Work	1
2.	Loca	al Context of Site	1
	2.1	Site Location	1
	2.2	Surrounding Land Use	4
	2.3	Geology, Soils and Hydrogeology	4
		2.3.1 Local Geology	4
		2.3.2 Local Soils	4
		2.3.3 Local Hydrogeology	5
3.	Site	History Review	6
	3.1	Site Inspection	6
	3.2	Interviews	10
	3.3	Titles Search	10
	3.4	Council Records	11
	3.5	Environmental Protection Agency Records	11
	3.6	New South Wales Environment Protection Authority Records	11
	3.7	Aerial Photograph Review	11
4.	Pote	ential Areas of Environmental Concern and Chemicals of Concern	12
5.	Con	clusions	13
6.	Proj	ect Limitations	13
7.	Refe	erences	14
8.	Арр	endices	15

List of Tables

Table 1.	Registered Owners – Lot 1 in DP 253346	10
Table 2.	Registered Owners – Lot 2 in DP 253346	10
Table 3.	Summary of historical aerial photograph review for Lot 1 and 2 in DP 253346 (County of Sandon, Parish of Gara)	11
Table 4.	Summary of Potential Areas of Environmental Concern and Chemicals of Concern on Lot 1 and 2 DP 253346 (County of Sandon, Parish of Gara)	12

List of Figures

Figure 1.	Site location for proposed new landfill (County of Sandon, Parish of Gara)	2
0	Site plan for Lot 1 and 2 in DP 253346 (County of Sandon, Parish of Gara),	_
	including proposed landfill area.	3

List of Plates

Plate 1.	Small Paddocks have sparse ground cover and are used for livestock grazing	6
Plate 2.	One of the two dams located on Lot 1 in DP 253346	7
Plate 3.	Small quarry located in the north eastern corner of Lot 2 in DP 253346	7
Plate 4.	The boundary of the small quarry located in the north eastern corner of Lot 2 in DP 253346	8
Plate 5.	Small quarry in the background of Lot 2 in DP 253346	8
Plate 6.	Sheep yards located in the centre corner of Lot 1 in DP 253346. The yards include pens and a race that are likely to have been used for drenching, jetting and vaccinating sheep	9
Plate 7.	Empty vaccination packs (foreground) and empty 44 gallon drums (background) beside the sheep yards located Lot 1 in DP 253346	9

List of Appendices

Appendix A.	Title Search and Registered Plans	.A
Appendix B.	Aerial Photograph	. B

1. Introduction

1.1 General

This report presents the findings of a Preliminary Contaminated Site Investigation (PCSI) undertaken by E.A. Systems Pty Limited (EAS) of Lot 1 DP 253346 and Lot 2 DP 253346 (County of Sandon, Parish of Gara) located on 597 Gara Road, Argyle, New South Wales. The coordinates for the approximate centre of the site are 383467 East and 6619175 North (GDA1994 MGA zone 56). A site location plan is provided in Figure 1. Figure 2 shows the site plan.

The site is proposed to be redeveloped to form the new Armidale Dumaresq landfill site and a PCSI is required for a development application.

1.2 Objectives and Scope of Work

The objective of the Preliminary Contaminated Site Investigation was to identify potentially contaminating activities that are currently being performed at the site and that may have been performed in the past on the site.

The scope of work included the following:

- A site history review and site visit to identify potential areas of environmental concern (AECs) and chemicals of concern (CoCs); and
- Assessment of site contamination based on the site history review and site visit.

2. Local Context of Site

2.1 Site Location

The site is located approximately 12 km east of the Armidale CBD along the Waterfall Way highway (also known as the Grafton Road) within the Armidale Dumaresq Council Municipality. The site is composed of sections of two lots known as *Sherraloy* Lot 2 in DP 253346 and *Edington* Lot 1 in DP 253346. The areas of *Sherraloy* and *Edington* that form the landfill site are approximately 36 and 28 hectares respectively (not including area of land required for road access). The site is bound by the Grafton Road to the north east, and rural properties to the south, east and west.



Figure 1. Site location for proposed new landfill (County of Sandon, Parish of Gara)



Figure 2. Site plan for Lot 1 and 2 in DP 253346 (County of Sandon, Parish of Gara), including proposed landfill area.

2.2 Surrounding Land Use

The surrounding land use is rural and is primarily applied to livestock (sheep and cattle) production. There is an olive grove located on the neighbouring property *Strathaven* 500 metres west of the proposed landfill site. The olive grove is estimated to be 7 ha in area. This grove is on the upper slopes of the catchment for the gully that runs from west to east across *Edington*. The land immediately north of *Edington* on either side of the Waterfall Way highway is part of the Gara Travelling Stock Reserve (TSR).

2.3 Geology, Soils and Hydrogeology

2.3.1 Local Geology

An on-ground geological survey of the site (Ashley, 2006) indicated that the underlaying substrate rocks within the landfill site are part of the Sandon Beds, and comprise siltstone, mudstone-argillite and chert. On the southern side of the landfill site are Tertiary age sedimentary rocks. There is a small Tertiary basalt mass approximately 0.5 km south of the landfill boundary. Sandon Beds greywacke comprise the dominant rock type surrounding the site.

2.3.2 Local Soils

A soil survey of the area undertaken by the Department of Natural Resources (King, in prep), indicates that the proposed landfill site occurs predominantly within two soil landscape groups; *Argyle* and *Middle Earth*. A small section of site, located along the drainage gullies, is classified as *Commissioners Waters*.

The description of the soil landscapes is presented below:

Argyle

Landscape—rolling low hills and occasional hills on greywacke/chert and related sediments. Local relief 30 - 80 m, slopes mostly 10 - 30%, elevation 910 - 1170 m. Minor rock outcrop (<10%) Partially cleared Eucalyptus caliginosa (New England stringybark) open woodland (King, in prep).

Soils—very shallow to shallow (<50 cm), well drained Basic Lithic Leptic Rudosols (Lithosols) and other shallow soils on crests, ridges and upper slopes. Shallow to moderately deep (40- 80 cm) moderately well drained Haplic Eutrophic Yellow Kandosols/ Tenosols (Yellow Earths) on midslopes and occasionally extending onto crests. Shallow to moderately deep (<80 cm) moderately well drained Yellow/Red and Grey Chromosols (Yellow and Red Podzolic Soils) on mid slopes, footslopes and drainage lines. Mottled-Subnatric Eutrophic Brown and Yellow Sodosols (Soloths) occur along some drainage depressions (King, in prep).

Commissioners Waters

Landscape—Narrow streams, swamps and occasional small floodplains/terraces on Quaternary alluvium. Includes Commissioners Waters and the Gara River. Local relief 0-10 m, slopes 0 - 3%, elevation 900–1070 m. Extensively cleared open woodland (King, in prep).

Soils—Variable soils according somewhat to the source rocks from which they are derived. Shallow to moderately deep (40 – 100 cm), well drained Alluvial Sands and Alluvial Loams (Yellow/ Brown and Grey Earths) occur in areas derived from coarse grained parent materials. Moderately deep to deep (>80 cm), moderately well drained Mottled Eutrophic Grey Chromosols/ Grey Sodosols (Gleyed Podzolic Soils/ Grey Brown Podzolic Soils/ Lateritic Podzolic Soils) are fairly common. Some Haplic Eutrophic Brown Dermosols/ Kandosols (Prarie Soils) are encountered along parts of Burying Ground Creek (King, in prep).

Middle Earth

Landscape—undulating plains, rises and footslopes on Sandon Beds. Local relief 0-30 m, slopes 0-10%, elevation 910 - 1120 m. Extensively cleared open woodland to partially cleared (King, in prep).

Soils—moderately deep to deep (>70 cm), moderately well drained Bleached-Mottled Haplic Eutrophic Yellow Kurosols and Chromosols (Yellow Podzolic Soils) are widespread. Deep (>100 cm), poorly drained Yellow Chromosols and Mottled-Mesonatric and Mottled-Subnatric Eutrophic Yellow Sodosols (Soloths) and Bleached-Manganic and Bleached-Ferric Eutrophic Yellow Chromosols (Lateritic Podzolic Soils/ Grey Brown Podzolic Soils) occupy drainage depressions and poorly drained areas. Occasional shallow (<40 cm), well drained Bleached Eutrophic Yellow Kandosols (Yellow Earths) on slopes with bedrock close to the surface (King, in prep).

2.3.3 Local Hydrogeology

The closest registered bore (GW 305317) is located approximately 80 m from the subject site. The geographic coordinates for this bore are $30^{0}33'16$ "latitude and $151^{0}46'49$ " longitude and date of establishment was July 2004. The bore summary obtained from the Natural Resource Management Groundwater Database indicates that for registered bore GW 305317 the aquifer is located in basalt rock with the top of the aquifer at 29.90 m below ground surface (BGS) and the aquifer floor is at 38.72 m BGS. The standing water level for this bore was 31.4 m with a yield of 0.76 litres per second.

Four groundwater bores installed onsite by E.A. Systems Pty Limited on 13^{th} October 2005 have shown no groundwater present from 0 - 5m BGS, and a fifth bore installed on 17^{th} November 2005 has shown no groundwater present from 0 - 10m BGS up to the time of writing (28^{th} April 2006). This suggests that during this period there have been no flows of groundwater within 5 metres of the surface under the proposed operational area, and no evidence of groundwater within 10metres of the surface between the two farm dams within the proposed operational area of the landfill.

The Gara River flows from north to south along the eastern boundary of *Edington*. The river frontage extends approximately 2500 m along the property boundary. The minimum distance between the Gara River and the potential site footprint for the landfill is 1,060 m.

Two intermittent drainage lines flow onto *Edington* from the western neighbouring property *Strathaven*. These drainage lines flow onto the site from westerly and south westerly directions for approximately 200 m before they merge to form a single intermittent gully that flows east a further 1300 m across *Edington* until it joins the Gara River at the north-western corner of the site.

Seven small farm dams are scattered across *Sherraloy*, and two small farm dams are present on *Edington*. The preliminary footprint area for the landfill and associated buffers contains two of these dams.

The Gara catchment is a major catchment in the local area. The Gara River runs into the Macleay River that eventually reaches the ocean at Trial Bay near South West Rocks in Northern NSW. The mid and lower reaches of the Gara and Macleay rivers are characterised by deep and extensive gorge systems that form part of the Oxley Wild Rivers National Park and the Central Eastern Rainforest Reserves World Heritage Area. The Gara River descends into a gorge approximately 4.3 km south-south-east of the landfill site in Oxley Wild rivers National Park. The distance along the riverbed between the closest point to the landfill site and the Oxley Wild Rivers National Park is 8.8km. Burying Ground Creek flows into the Gara River from the east at a point 800 m upstream of the Oxley Wild Rivers National Park.

3. Site History Review

The site history review included the following:

- A site visit by an E.A. Systems Environmental Scientist;
- Interviews with people familiar with the history and operations of the site;
- A review of Council records on the site;
- A review of aerial photography dated 13th May 2001

3.1 Site Inspection

The following observations were noted during the site inspection conducted on 8 September 2005:

- The primary land use of the subject lots has been livestock grazing (Plates 1 and 2).
- A small quarry was in operation in Lot 2 DP 253346, this quarry has been used for extracting gravel (Plates 3 to 5).
- Sheep yards were located in Lot 1 DP 253346 (Plate 6).
- Two empty 200 litre (44 gallon) drums and discarded empty vaccination packs were observed on the ground beside the sheep yards (Plate 7). The tops of the drums were intact, indicating that the drums had not been used for mixing of chemicals.
- There was no evidence of earth fill material (acquired from another site) present on the site.



Plate 1. Small Paddocks have sparse ground cover and are used for livestock grazing



Plate 2. One of the two dams located on Lot 1 in DP 253346



Plate 3. Small quarry located in the north eastern corner of Lot 2 in DP 253346



Plate 4. The boundary of the small quarry located in the north eastern corner of Lot 2 in DP 253346



Plate 5. Small quarry in the background of Lot 2 in DP 253346



Plate 6. Sheep yards located in the centre corner of Lot 1 in DP 253346. The yards include pens and a race that are likely to have been used for drenching, jetting and vaccinating sheep



Plate 7. Empty vaccination packs (foreground) and empty 44 gallon drums (background) beside the sheep yards located Lot 1 in DP 253346

3.2 Interviews

Mr Derry Crisp, who acquired *Sherraloy* in 1986, was interviewed by telephone on 10th April 2006 to gain information about the historical land uses on the property. Mr Crisp confirmed that there were no old stock dips or rubbish tips present on the property, there had been no storage of dangerous goods or explosives on the property, and there had been no storage of pesticides or herbicides. Furthermore, Mr Crisp's property is an accredited "CattleCare" property. An accredited CattleCare property must be managed to prevent unacceptable residues accumulating in cattle (DPI&F, 2006). This accreditation required an assessment of the risk of soil on the property being contaminated with persistent chemicals.

Mr Ken Waters, who acquired *Edington* in 1974, was interviewed by telephone on 5th May 2006. Mr Waters confirmed that there had been no storage of dangerous goods or explosives on the property, there were no old stock dips or rubbish tip sites and there had been no storage of pesticides or herbicides on *Edington*. Mr Waters confirmed that the empty 44 gallon drums located near the sheep yards had not been used for mixing of chemicals, they had been used as tables to hold gear for lamb marking.

3.3 Titles Search

A list of past and present registered owners and lessors was obtained from the New South Wales Department of Lands. Registered owners of Lot 1 in DP 253346 are summarised in Table 1 while registered owners of Lot 2 in DP 253346 are summarised in Table 2.

Table 1.	Registered Owners – Lot 1 in DP 253346	
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Year of Acquisition	Registered Owner	
1974	Kenneth Paul Waters and Deirdre Antoinette Waters	

Table 2.Registered Owners – Lot 2 in DP 253346

Year of Acquisition	Registered Owner
1986	Derry Wallace Crisp and Gail Margaret Crisp

Results of the title search are provided in Appendix A.

3.4 Council Records

Armidale Dumaresq Council records regarding Lot 1 and 2 in DP 253346 (County of Sandon, Parish of Gara) located on 597 Gara Road, Argyle, New South Wales were available for review. A summary of the findings of these records is outlined below;

Lot 1 in DP 820271 and Lot 2 in DP 253346

- 30th August 1983 A building application was submitted to the Armidale Council for the development of a single dwelling house in Lot 2 DP 253346.
- 3rd August 1990 A building application to the Shire of Dumaresq for a house extension.
- 11 June 1999 Application for approval to operate an onsite sewage management system
- 22 August 2002 S149 certificate

3.5 Environmental Protection Agency Records

A review of the EPA Environmental Management Register (EMR) provided the following information:

• Lot 1 and 2 in DP 253346 is not in the EMR;

3.6 New South Wales Environment Protection Authority Records

A search of the New South Wales EPA records was conducted on the 30 January 2006. No contaminated land record has been issued for the subject site.

3.7 Aerial Photograph Review

An aerial photograph dated May 2001 was reviewed to determine whether there was an indication of previous landuse activities. A scanned copy of the aerial photo is attached in Appendix B and is described in Table 3.

Table 3.Summary of historical aerial photograph review for Lot 1 and 2 in DP 253346 (County of Sandon,
Parish of Gara)

Year	Observation
2001	Land sparse with minimal vegetation cover. Vegetation cover on upper slopes and toward the Waterfall Way (Grafton Road). Two dams evident in the aerial photograph. The sheep yards and the quarry are visible in the photograph.

4. Potential Areas of Environmental Concern and Chemicals of Concern

Based on the site history, potential areas of environmental concern and associated chemicals of concern were identified. These are summarised in Table 4.

Potential Areas of Environmental Concern	Description of Potentially Contaminating Activity	Chemicals of Concern	Likelihood of Contamination (Based on Site History Review) ^A	Comments
Waste Oil	Waste oil from the maintenance of heavy vehicles may have been disposed of on-site.	TPH PAHs Lead Phenol Additives	Low	The maintenance of heavy vehicles would have resulted in the generation of waste oil. The site history review cannot rule out with certainty that waste oil was disposed off-site. This may be limited to the quarry site.
Sheep Yards	Spraying Drenches	DDT, Arsenic and lead based pesticides OCs OPs		Usually low level and diffuse. Contamination, if present, is likely to be limited to the near subsurface.
Sewage Management	Potential bacterial contamination	Bacterial contamination	Low	Residence is located outside the area of interest approximately 300 m on the other side of a ridge from the proposed landfill site boundary.
Entire Site	Contaminated fill material may have been imported to the site.	Metals PAHs TPH OCPs Asbestos PCBs	Low	Site observations suggest that significant fill material is unlikely to be present at the site.
	Pesticides may have been applied within the property boundaries for weed or pest management.	OCPs OPPs Metals TPs SPs	Low	Contamination, if present, may be limited to the near subsurface.
LEGEND: A Qualitative as	ssessment of the probability of	TPH	Fotal Petroleum Hydrocarbon	
BTEX Benzene, Tol	f contamination uene, Ethyl Benzenes and Total Xyle Aromatic Hydrocarbons aed Biphenyls	enes MTBE I OCPs (OPPs (Methyl Tertiary Butyl Ether Organochlorine Pesticides Organophosphorus Pesticides Synthetic Pyrethroids	

Table 4.Summary of Potential Areas of Environmental Concern and Chemicals of Concern on Lot 1 and 2
DP 253346 (County of Sandon, Parish of Gara)

5. Conclusions

Based on the site history review and site inspection, it is considered that:

- There is no evidence of oil spills or stains from the use of heavy vehicles in the quarry area.
- No dangerous goods or explosives were used in the quarry.
- No chemicals of concern have been used for gravel extraction.
- There is no evidence of either contaminated or clean earth fill material (acquired from another site) present on the site.
- There is no evidence of old rubbish tips on the site.
- The onsite sewage system connected in 1991 for the residence on Lot 2 DP 253346 is outside the proposed landfill site boundary (approximately 300 m down slope on the other side of a ridge) and is therefore unlikely to be a source of potential contamination for the site.
- There may be areas in and around the sheep yards that have been exposed to chemicals associated with routine sheep drenching, jetting and vaccination. However there is no permanent infrastructure present that would have allowed dipping or fixed hose jetting, therefore any contamination would be low and limited to localised surface stains.
- The overall potential for the site to be contaminated is low.

6. Project Limitations

The report will not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should further information become available regarding the conditions at the site, including previously unknown likely sources of contamination, E.A. Systems Pty Limited reserves the right to review the report in the context of the additional information.

7. References

Ashley, P. (2006) Geological report on proposed Armidale Dumaresq Council landfill site with emphasis on investigation of a possible geological fault. Report prepared for E.A. Systems Pty Limited. E.A. Systems Pty Limited, Armidale.

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8. Appendices

Appendix A.	Title Search and Registered Plans	А
Appendix B.	Aerial Photograph	В