ENVIRONMENTAL EARTH SCIENCES
THE KNOW AND THE HOW

REPORT NO. 509020

SUMMARY REVIEW OF ANALYTICAL DATA AND REMEDIATION OPTIONS FOR FORMER BANGALOW DIP ASHTON STREET, BANGALOW, NSW

ENVIRONMENTAL EARTH SCIENCES NNSW
REPORT TO BYRON SHIRE COUNCIL
DECEMBER 2009

Glaeba (07) Pty Ltd trading as Environmental Earth Sciences NNSW
PO Box 1519, Ballina, NSW 2478
Phone / Fax: 61 2 6686 9744 Email: eesnnsw@eesi.biz
www.environmentalearthsciences.com

EXECUTIVE SUMMARY

Environmental Earth Sciences NNSW undertook a review of available data and remediation options for the former cattle tick dip site, known as the Bangalow Saleyards dip, Ashton Street, Bangalow.

The NSW Department of Agriculture carried out a number of investigations at the site between 1991 and 1999 to assess the extent of contamination associated with the former dip site operation.

Four samples exceeded site DDT criteria while 38 soil sampling locations exceeded the parks and open space health based investigation criteria for arsenic.

Onsite containment of impacted soil within the dip yard area beneath a sealed carpark area is recommended.

The proposed carpark covers the former dip bath and yards however several sampling points from outside the proposed capped area exceed guideline criteria. Given that five of these surface samples are considered hotspots, a remedial strategy to address this contamination is required.

To ensure that all of these hotspot samples are addressed, approximately 50 m^3 (*in-situ*) of arsenic affected soil will require remediation. The anticipated depth requiring remediation is 0.3 m.

The average DDT concentration of the soil to be remediated is 4.5 mg/kg which complies with the waste disposal criteria (50 mg/kg). Accordingly, this soil can either be disposed as solid waste to landfill (assuming preliminary characterisation results comply with waste disposal criteria) or it can be included as part of the carpark capped area with no further assessment required.

In order to proceed with remediation activities, a remedial action plan (RAP) should be developed to outline the remediation process that will be undertaken. This information shall form the basis of the information that will be required to be sent to DECCW as part of the remediation notice.

As soil exceeding guideline criteria will be capped within the site, a management plan should also be developed to minimise the risk of exposure to contaminated soil in the event that the barrier is breached. Council shall make note of this containment cell as part of their notifications under Section 149 of the Environmental Planning & Assessment Act 1979 to ensure continued protection and awareness.

Project Manager
Christine Pitman
Principal Scientist

Project Director / Internal Reviewer
Stuart Brisbane
Principal Soil Scientist

TABLE OF CONTENTS

1 INTRODUCTION

Environmental Earth Sciences NNSW is pleased to present our review of available data and remediation options for the former cattle tick dip site, known as the Bangalow Saleyards dip, Ashton Street, Bangalow.

Industry & Investments NSW (formerly the NSW Department of Agriculture and more recently Department of Primary Industries) carried out a number of investigations at the site between 1991 and 1999 to assess the extent of contamination associated with the former dip site operation.

Environmental Earth Sciences NNSW has reviewed this data to identify any gaps or limitations with this data and recommends potential remediation strategies to enable the site to be suitable as a sealed carpark.

This report will outline the estimated volume and concentrations of contaminated soil together with an outline of remediation options.

The work undertaken is in accordance with Environmental Earth Sciences NNSW proposal number PO509015 dated 23 March 2009 and approved on 12 October 2009.

2 SCOPE OF WORKS

This study proposes to review the existing site data and develop a summary report that will determine:

- the integrity, quality and appropriateness of data;
- the extent of remediation required to comply with parks, recreational open space guidelines;
- the potential for off-site disposal or onsite containment of identified impacted areas; and
- if there will be any associated restrictions to future land use.

The desktop evaluation of analytical data provided by Byron Shire Council will:

- examine the laboratory results from samples collected as part of the initial site characterisation sampling, discussing the adequacy of issues such as sampling density, sampling locations, sample depth and frequency of laboratory analysis;
- establish if the type and concentration of contaminants allow disposal of soil off site (if required); and.
- establish if any additional soil information such as delineating the vertical extent of contamination will be required prior to redevelopment of the site.

3 SITE CHARACTERISTICS

The former Bangalow Saleyard dip site comprises an area of land between Ashton and Deacon Streets within the confines of the community parkland, Lot 2 DP 747876 and part of the former Crown road reserve (part Ashton Street) (Figure 1).

3.1 Location and property description

Summary site details:	Lot 2 DP747876
Street address:	Ashton Street
Town:	Bangalow, New South Wales
Local Council:	Byron Shire Council
Zoning:	Public recreation 6(a)

The site lies approximately 50 metres to the north of Byron Creek and is located between the existing community tennis court to the west, an unformed road reserve known as Ashton Street to the west and the Bangalow Historical Society building (known as Heritage house) to the north (Figures 1 and 2).

Residential properties are located approximately 100 m from the site, across Deacon Street, while the Anglican Church, Church Hall and Minister's residence are situated approximately 50 m to the north - east across Ashton Street.

3.2 Topography and site drainage

Topography comprises of level to gently undulating, broad to extensive alluvial plains of extremely low relief (<5 m). Slopes range from 0 - 2%, with localised steeper (>10%) areas on edges of ox bows and scour faces. Elevation is 20 - 40 m. Stream channels are alluvial, incised and moderately deep (Morand, 1994).

The site is located within 1 in 100 year flood prone land.

3.3 Regional geology, soil and vegetation

The geology of the site is described in the Tweed Heads *1:250 000 Geological series sheet 56-3* as Tertiary aged Lismore Basalt of the Lamington Volcanics. This is primarily made up of agglomerate (pyroclastic rock with fragments mostly > 0.02 m diameter) and bole (inter-bedded fossil laterite and basalt lava flows).

The soils observed at the site incorporate soils classified in the *Soil Landscapes of the Lismore and Ballina 1:100 000 series sheet* as belonging to the alluvial Eltham Soil Landscape. A soil landscape is an area of land with unique landform features containing a characteristic set of soils.

Soils are mostly deep (>2.0 m) well drained alluvial Krasnozems. Soil permeability in this region is reported to be rapid with low water holding capacity (Morand, 1994).

Vegetation is described as extensively cleared closed forest (rainforest).

3.4 Hydrogeology

A review of NSW Natural Resource Atlas database indicated that there were approximately five licensed groundwater bores located within a one kilometre radius of the site. Two were listed as monitoring bores, while three were for domestic stock or irrigation purposes. All the bores were located at a higher elevation than site.

Groundwater was recorded at depths of 16 m, 27 m and 42 m within weathered basalt layers. The standing water level of these bores was between 2.61 and 15 m indicating a confined aquifer.

Groundwater at the site is therefore likely to be contained within the fractured basalt at depths of 5 – 10 m. Given the close proximity to Byron Creek, interface drainage is expected to be encountered at depths between 1 – 2.5 metres below ground surface.

3.5 Site history

According to Industry & Investments NSW, Cattle Tick Program records, the site was previously part of the Bangalow Saleyards and was in operation from 1925 when the dip bath was constructed. The demolition of the yards and dip bath was completed on April 1995.

The following tickicide chemicals were used at this site:

- arsenic from August 1925;
- the organochlorine pesticide, dichloro-diphenyl-trichloroethane (DDT) from August 1955 and
- the organophosphate pesticides:
    - coumaphos (June 1962);
    - ethion (January 1967);
    - ethion chlorimedform (October 1973);
    - amitraz (November 1976);
    - promacyl (March 1977);
    - cymiazole (June 1981);
    - cypermethrin chlorfenvinphos (April 1986); and
    - amitraz (March 1992) until the dip ceased operation in 1995.

3.6 Chemicals of concern

The chemicals of concern associated with the former dip site were identified as arsenic and the organochlorine pesticide dichloro-diphenyl-trichloroethane (DDT).

Organophosphate pesticides (OPP) such as ethion are readily biodegradable, with concentrations often undetectable within a year of application. Ethion will degrade with a half life ranging from 1.3 to 8 weeks (EXTOXNET, 1993) and amitraz has a reported half life of one day (EXTOXNET, 1995).

As the site has not operated since 1995, all OPPs are not considered a potential chemical of concern (PCoC) for soils and/or groundwater at the site. This was supported by laboratory testing following the decommissioning of the dip site in 1999.

4 REVIEW OF ANALYTICAL DATA

The NSW Department of Agriculture carried out several investigations at the site in 1991 and 1993, prior to decommissioning activities. Samples were collected on a judgemental basis, concentrating around the bath, draining pen and along the inferred drainage lines.

During decommissioning activities, the dip bath fluids were removed from site by tanker, the bath was filled with soil and topsoil was placed over the bath and low areas of the site. Following the decommissioning and dismantling of the yard, an additional investigation was undertaken in August 1999, where 55 sample locations (1 - 55) were collected along a 7 m grid across the site (Figure 2).

The investigations aimed to delineate the extent of contamination, associated with former dip bath activities.

4.1 Adequacy of sampling methodology

Samples were obtained by DPI CTP staff using a hand auger or push tube sampler. The sampling interval for the majority of samples was less than 0.25 m in depth. Samples were collected from a maximum depth of 1.25 m, however the maximum depth sampled from most locations did not exceed 0.45 m.

We understand that the 1999 samples were collected in general accordance with the Department's standard operating procedures and quality systems. Environmental Earth Sciences have reviewed this policy and found it to be suitable to provide a level of confidence on the results obtained.

4.2 Adequacy of sampling plan

A total of 177 samples were analysed from 83 sample locations to a maximum depth of 1.25 m in an attempt to delineate the vertical and lateral extent of contamination associated with the operation of the cattle dip.

Exact soil sample locations for the 24 August 1993 sampling round are unclear. However it should be noted that all investigations undertaken prior to dip decommissioning may not be representative of post decommissioning conditions given that some material may have been removed from site, or placed in the base of the dip bath and some topsoil was used to fill low lying areas.

According to the NSW EPA (1995) *Sampling design guidelines*, based on the size of the investigation area (approximately 2,500 m^2), a minimum of 35 sample points were required. The greater sampling density is warranted given the historical use of the site and the nature and distribution of potential contamination from dip sites.

5 GUIDELINE CRITERIA FOR THE SITE

The NSW Department of Environment, Climate Change and Water (formerly the NSW EPA) refer to a number of guidelines relevant to the assessment of contaminated sites. There are two separate criteria that must be considered during this soil remediation project, namely, the site investigation criteria and waste disposal criteria.

The following guidelines were referenced both during the data review and assessment of remediation options:

- ANZECC (1992) – *Guidelines for the assessment and management of contaminated sites*;
- National Environment Protection Council (NEPC) (1999) – *National Environment Protection (Assessment of Site Contamination) Measure* (NEPM);
- NSW DEC (2006) – *Contaminated sites: guidelines for the NSW site auditor scheme*;
- NSW DEC (2007) – *Contaminated sites: guidelines for the assessment and management of groundwater contamination*;
- NSW DECC (2008) – *Waste Classification Guidelines Part 1: Classifying Waste* (the Waste Guidelines);
- NSW EPA (1995) – *Contaminated sites: sampling design guidelines*;
- NSW EPA (1997) – *Guidelines for consultants reporting on contaminated sites*; and
- SEPP55 – *Remediation of land (1998) Managing Land Contamination – Planning guidelines*.

The NSW DEC (2006) – *Contaminated sites: guidelines for the NSW site auditor scheme* cites investigation levels for soil in the assessment of site contamination.

5.1 Guidelines for soil

The remediation objective is to ensure that the site will not pose an unacceptable risk to human health or the environment.

The site is zoned Public recreation 6(a); therefore the parks, recreational open spaces and playing fields (reproduced as Column E of Table 1) are thought to be the most appropriate. These guideline levels are has been sourced from Table 5A in Schedule B (1) of the NEPM and these investigation levels are derived from toxicity of substances and estimated exposure of humans to the soil.

The provisional phytotoxicity based investigation levels (PILs) outlined in the NSW EPA (2006) Contaminated sites: *Guidelines for the NSW Site Auditor Scheme* are not considered appropriate to this investigation as:

- the guideline levels are intended as a screening guide for sandy loam soils, while the site soil comprises both silty clay and clay;
- the site soil is a Krasnozem, which is rated as moderately to highly fertile compared with other Australian soil groups;
- the cation exchange capacity (CEC) of the Krasnozem was assessed to determine the buffering capacity of the soil to changes in pH, available nutrients, calcium levels and

soil structural changes. The site soil has a moderate CEC (21.9-23.2 meq/100g) (Morand, 1994) and thus is moderately resistant to changes in soil chemistry that are caused by land use (Hazelton & Murphy, 2007);

- leachability tests carried out on arsenic contaminated soil from similar soil types site showed that arsenic concentrations are well bound (adsorbed) to the soil particles and are therefore not likely to be available to plants (Kimber S, et. al. 2002);
- the site is proposed to be sealed for use as a carpark with limited opportunity for plant growth; and
- existing vegetation onsite shows no visible sign of stress or phytotoxicity.

Overall, the site will be considered acceptable for residential land use with accessible soils if:

- the 95% upper confidence limit on the average concentration for each chemical is below the nominated criterion;
- no single result is greater than 250% of the nominated criterion; and
- the standard deviation of the data set for each chemical is less than 50% of the nominated criterion.

Any individual sample result that causes the data set to be not compliant with the requirements stated above may be considered to represent a “hot spot” of impacted material and further action may be necessary in order for the site to be validated. Further action may include excavation of additional material and re-sampling.

5.2 Waste disposal guidelines

Any soil that is removed from site and disposed at a licensed solid waste facility that is able to accept this material is required to be classified in accordance with the NSW DECC (2008) *Waste Classification Guidelines Part 1: Classifying Waste* (the Waste Guidelines).

The waste guidelines state that the general solid waste acceptance criteria for arsenic and/or DDT contaminated soils from cattle dip sites is as follows:

- arsenic: The toxicity characteristic leaching procedure (TCLP) of the soils must be less than or equal to 5 mg/L. The specific contaminant concentration (SCC, ie. total concentration) in the soil can be ignored for cattle tick dip sites, as explained in the General Immobilisation Approval No. 1999/03;
- DDT (including DDD & DDE): The SCC must be less than or equal to 50 mg/kg. The TCLP of the soil can be ignored as explained in Table 2 of the Waste Guidelines; and
- where dip soil is contaminated with both arsenic and DDT, both acceptance criteria must be met.

TABLE 1 NATIONAL ENVIRONMENTAL HEALTH FORUM HEALTH-BASED SOIL INVESTIGATION LEVELS (1999)

SUBSTANCE	Health-based Soil Investigation Levels (mg/kg)					
Exposure Settings	**A**	**B[a]**	**C[a]**	**D**	**E**	**F**
Arsenic (total)	100			400	200	500
Cadmium	20			80	40	100
Chromium (III)	12%			48%	24%	60%
Chromium (VI)	100			400	200	500
Cobalt	100			400	200	500
Copper	1 000			4 000	2 000	5 000
Lead	300			1 200	600	1 500
Manganese	1 500			6 000	3 000	7 500
Methyl mercury	10			40	20	50
Mercury (inorganic)	15			60	30	75
Nickel	600			2 400	600	3 000
Zinc	7 000			28 000	14 000	35 000
Aldrin + Dieldrin	10			40	20	50
Chlordane	50			200	100	250
DDT+DDD+DDE	200			800	400	1 000
Heptachlor	10			40	20	50
Total PAH	20			80	40	100
Benzo (a) pyrene	1			4	2	5
Phenol	8 500			34 000	17 000	42 500
PCBs (total)	10			40	20	50
TPH >C_{16}-C_{35} aromatics	90			360	180	450
TPH >C_{16}-C_{35} aliphatics	5 600			22 400	11 200	28 000
TPH >C_{35}	56 000			224 000	112 000	280 000

Exposure Settings:

A. 'Standard' residential with garden/accessible soil (less than 10% intake of home grown produce; no poultry): this category includes children's day-care, pre-schools etc.
B. Residential with substantial vegetable garden (contributing up to 50% of vegetable and fruit intake) and poultry providing all dietary egg intake and 25% poultry meat intake.
C. Residential with substantial vegetable garden (contributing up to 50% of vegetable and fruit intake); poultry excluded.
D. Residential with minimal opportunities for soil access includes high-rise apartments and flats.
E. P arks, recreational open space and playing fields: includes secondary schools.
F. Commercial/Industrial: includes premises such as shops and offices as well as factories and industrial sites. (If, however, a commercial site is also used for residential purposes or regular soil access by children if possible then the appropriate 'residential' setting should be used.) It is assumed that thirty years is the duration of exposure.

a Site and contaminant specific

6 LABORATORY RESULTS

One hundred and seventy seven samples collected by NSW Department of Agriculture staff from 83 known locations were analysed for arsenic and DDT. All analytical results are presented in Appendix A.

Four samples exceeded site DDT criteria while 38 soil sampling locations exceeded the parks and open space health based investigation criteria for arsenic. The distribution of impacted soil appears to be highest in the vicinity of the bath, in the draining yard and down gradient of the site approximately 20 metres to the south.

The majority of samples were collected from depths of less than 0.3 m across the site. The most likely cause of impact away from the actual bath and scooping mound/ sludge pit is as a result of pumping out the bath fluids across the yard when the bath was being maintained or chemicals replaced.

Dip bath chemicals were not detected in samples collected down gradient of the yard, with the exception of those samples about a drain. Down gradient samples suggest that dip bath impact did not extend to Byron Creek.

Twenty three of these locations have been defined as a hotspot. A hotspot is an area containing contaminant concentrations greater than 250% of the guideline criteria (eg arsenic concentrations >500 mg/kg or DDT >1,000 mg/kg).

Seven soil samples contained DDT concentrations in excess of the waste guideline disposal threshold (50 mg/kg). Accordingly, it is not possible to remediate the entire site using an offsite disposal method.

An alternative remediation strategy proposed by Council is to cap the contamination *in-situ* beneath a sealed carpark, thus preventing potential exposure to this soil.

The proposed carpark covers the former dip bath and yards however several sampling points from outside the proposed capped area exceed guideline criteria (as detailed in Table 2).

TABLE 2 SOIL RESULTS OUTSIDE CARPARK AREA THAT EXCEED OPEN SPACE CRITERIA

Sample ID	Depth (m)	Sample date	Arsenic (mg/kg)	DDT (mg/kg)
Y4	0-0.25	6/5/93	304	24
Y8	0-0.3	24/8/93	**1,500**	5.7
Y8	0.3-0.6	24/8/93	213	4.2
M10	0-0.15	6/5/93	**617**	2.3
M10 (+2m above drain)	0-0.15	24/8/93	**1,400**	2.8
M10 (0 m above drain)	0-0.15	24/8/93	**2,300**	4.0
M20	0-0.15	6/5/93	215	2.5
M20 (-3 m below drain)	0-0.15	24/8/93	310	3.1
M20 (-9 m below drain)	0-0.15	24/8/93	**1,300**	2.2
M25 (-3 to +3 m from drain)	0-0.15	24/8/93	255	4.6
30	0-0.15	9,11,12/8/99	227	0.78
Guideline criteria			200	400

Notes
1. guideline values taken from NEHF (1998) Health-based soil investigation levels, column E for parks and recreational open space use
2. shading denotes an exceedance of guideline criteria, bold values denote hotspot values

Given that five of these surface samples are considered hotspots, a remedial strategy to address this contamination is required.

6.1 Statistical analysis

When assessing the analytical results, the remedial requirements for the site are considered to be met if the 95% upper confidence limit (UCL) on the average concentration for each chemical is below the nominated criterion.

The 95% UCL implies that there is a 95% probability that the “true” arithmetic average contaminant concentration within the sampling area will not exceed the value determined by this method. The upper estimate of the arithmetic average contaminant concentration of a sampling area can be determined using Procedure D of the *Sampling Design Guidelines* (NSW EPA, 1995).

Statistical analysis was undertaken on all results from outside the capped carpark area and road access to Ashton Street to establish if the 95% UCL on the arsenic concentrations are below site criteria. No statistical analysis was undertaken for DDT as all results outside the capped area were below site criteria.

The NEPM guidelines state that no individual analytical result can be above 250% of the nominated site criteria. Therefore the five hotspot areas that contain greater than 500 mg/kg of arsenic will require remediation/removal from site.

In order to ensure the site will comply with the 95% UCL if the hotspot areas outside of the capped areas are removed (or included under the cap), these hotspot results were excluded from the statistical analysis. Statistical results are provided in Table 3.

TABLE 3 DESCRIPTIVE STATISTICS — SITE EXCLUDING CAPPED AREAS

Analyte	Arsenic (hotspots removed)
Count	86
Mean	45.87
Maximum	304
Standard Deviation	67.5
Coefficient of variation	1.47
95% UCL	83.42 (log normal)
Guidelines	200

Note:
1. guideline values taken from NEHF (1998) Health-based soil investigation levels, column E for parks and recreational open space use

Based on the statistical analysis and interpretation as outlined in the NEPM guidelines, once the five hotspot locations are remediated and the excavation area successfully validated, the site will be suitable for parks and recreational open space use as:

- the 95% upper confidence limit is below the nominated criterion;
- the standard deviation of the data set is less than 50% of the nominated criterion; and,
- no single result is greater than 250% of the adopted analyte criteria.

7 REMEDIATION STRATEGY

Given the site is subject to a remediation notice (former Section 35 Notice) under the Contaminated Land Management Act 1997, any proposed works will require written approval from the Department of Environment, Climate Change and Water before proceeding.

As seven soil samples contain concentrations of DDT that fail landfill disposal criteria, offsite disposal is not a suitable remediation strategy. Given the prohibitive expense of remedial technologies such as thermal desorption, on site containment beneath a capping layer is a viable and preferred solution.

The objective of the proposed remediation is to ensure that the site is suitable for parks, recreational open space use.

To achieve this criteria, we propose to remediate the five identified hotspot locations where soil results exceed the guideline criteria by 250% (locations Y8, M10 (three location about this point) and M20). All of these hotspot samples were collected prior to dip

decommissioning activities and the exact sample locations are only approximate, however they all appear to follow a drainage line from the dip yard.

In order to ensure that all of these hotspot samples are addressed, approximately 50 m^3 (*in-situ*) of arsenic affected soil will require remediation (Figure 3). The anticipated depth requiring remediation is 0.3 m.

The average DDT concentration of the soil to be remediated is 4.5 mg/kg which complies with the waste disposal criteria (50 mg/kg). Accordingly, this soil can either be disposed as solid waste to landfill (assuming preliminary characterisation results comply with waste disposal criteria) or it can be included as part of the carpark capped area with no further assessment required.

The leachability of arsenic must be assessed using the toxicity characteristics leaching procedure (TCLP) test as part of the waste guidelines. No leachability tests were undertaken during the site investigations; however arsenic TCLP tests undertaken on Krasnozems from other dip sites suggest the results should comply with the guideline criteria.

The following remedial strategy is recommended:

- excavate the estimated remediation area (approximately 50 m^3 *in-situ*) to a depth of 0.3 m and validate these excavations to prove that the remaining soil is below guideline criteria (testing for arsenic and DDT);
- upon receipt of laboratory results, clean, tested fill will be used to reinstate the excavation void, which can then be stabilised with turf;
- this stockpiled soil can either be characterised (testing DDT, arsenic and arsenic leachability) to determine if it is suitable for offsite disposal at landfill or placed directly within the area to be capped and included as part of the onsite containment/ carpark area;
- a validation report should be produced fully documenting the remediation process and all laboratory results.

As soil exceeding guideline criteria will be capped within the site, a management plan should be developed to minimise the risk of exposure to contaminated soil in the event that the barrier is breached. Council shall make note of this containment cell as part of their notifications under Section 149 of the Environmental Planning & Assessment Act 1979 to ensure continued protection and awareness.

In order to proceed with remediation activities, a remedial action plan (RAP) should be developed to outline the remediation process that will be undertaken. This information shall form the basis of the information that will be required to be sent to DECCW.

8 CONCLUSION

The desktop study undertaken of the investigations carried out at the former Bangalow Saleyards dip site, Ashton Street, Bangalow, NSW has established that the soil sampling programs were generally adequate to identify the presence of hotspots and generally characterise the level of contamination at the site.

Onsite containment of impacted soil within the dip yard area beneath a sealed carpark area is recommended. Investigation results suggest that either offsite disposal (pending satisfactory laboratory results) or onsite encapsulation are potential remedial options for the identified hotspot areas.

Removal or encapsulation of soil from the following identified locations Y8, M10 (three location about this point) and M20 will ensure that the site can be considered suitable for parks and recreational open space use.

Prior to actioning the remedial strategy, a Remedial Action Plan (RAP) should be developed outlining the remediation methodology and the sampling and validation program to be undertaken to ensure compliance with all relevant state and local government guidelines and legislation.

9 LIMITATIONS

This letter report has been prepared by Environmental Earth Sciences NNSW ABN 109 442 284 in response to and subject to the following limitations:

1. The specific instructions received from Byron Shire Council;
2. The specific scope of works set out in PO509015 issued by Environmental Earth Sciences NSW for and on behalf of Byron Shire Council, is included in Section 2 (Objectives) of this report;
3. May not be relied upon by any third party not named in this report for any purpose except with the prior written consent of Environmental Earth Sciences NNSW (which consent may or may not be given at the discretion of Environmental Earth Sciences NNSW);
4. This report comprises the formal report, documentation sections, tables, figures and appendices as referred to in the index to this report and must not be released to any third party or copied in part without all the material included in this report for any reason;
5. The report only relates to the site referred to in the scope of works being located at Lot 2 DP747876, Ashton Street, Bangalow, New South Wales (“the site”);
6. The report relates to the site as at the date of the report as conditions may change thereafter due to natural processes and/or site activities;
7. No warranty or guarantee is made in regard to any other use than as specified in the scope of works and only applies to the depth tested and reported in this report;
8. Fill, soil, groundwater and rock to the depth tested on the site may be fit for the use specified in this report. Unless it is expressly stated in this report, the fill, soil and/or rock may not be suitable for classification as clean fill if deposited off site; and
9. Our General Limitations set out at the back of the body of this report.

10 REFERENCES

Australian and New Zealand Environment and Conservation Council/National Health and Medical Research Council (1992) — *Australian and New Zealand guidelines for the assessment and management of contaminated sites*.

Beard, J (1993) — *The evaluation of DDT contaminated soil associated with cattle tick dip sites*. The second national workshop on the health risk assessment and management of contaminated sites.

Department of Mineral Resources (1972) — 1:250 000 *Tweed Heads Geological Series Sheet* 56-3 1st Edition.

EXTOXNET (1995) — *Pesticide Information Profiles* http://pmep.cce.cornell.edu/profiles/extoxnet/dienochlor-glyphosate/ethion-ext.html

EXTOXNET (1993) — *Pesticide Information Profiles* http://pmep.cce.cornell.edu/profiles/extoxnet/amitraz

Hazleton P and Murphy B (2007) — *Interpreting soil test results, What do all the numbers mean?*

Kimber S, Sizemore D and Slavich P (2002) — *Is there evidence of arsenic movement at cattle tick dip sites* Australian Journal of Soil Research, Vol 40 pp 1103-1114.

Morand D T (1994) — *Soil landscapes of the Lismore-Ballina 1:100 000 sheet Map*, Soil Conservation Service of NSW, Sydney.

National Environmental Protection Council (NEPC) (1999) — *National environmental protection (assessment of site contamination) measure*.

NSW Agriculture (1996) — *Guidelines for the assessment and cleanup of cattle tick dip site for residential purposes*.

NSW Department of Environment and Climate Change (2008) — *Waste classification guidelines, Part 1: Classifying Waste.*

NSW Department of Environment and Conservation (2006) — *Contaminated sites: guidelines for the NSW site auditor scheme* (2nd edition).

NSW Environment Protection Authority (1995) — *Contaminated sites: sampling design guidelines*.

NSW Environment Protection Authority (1997) — *Contaminated sites: guidelines for consultants reporting on contaminated sites*.

NSW Natural Resource Atlas (2009) — http://nratlas.nsw.gov.au/

SEPP55 — Remediation of land (1998) *Managing Land Contamination – Planning guidelines*.

11 GLOSSARY OF TERMS

The following descriptions are of terms used in the text of this report.

Adsorption attraction and binding of solutes from an (usually) aqueous solution to surfaces of solid or colloidal particles with which it is in contact.

Alluvial describes material deposited by, or in transit in, flowing water.

Aquifer rock or sediment in a formation, group of formations, or part of a formation which is saturated and sufficiently permeable to transmit economic quantities of water to wells and springs.

Background natural level of a property.

Bio-availability amount of a substance able to be assimilated during the digestion process of an organism.

Borehole an uncased well drill hole.

Capillary Fringe zone immediately above the water table, upward into which water is drawn by capillary forces.

Cation Exchange Capacity (CEC) maximum positive charge required to balance the negative charge on colloids (clays and other charged particles). The units are milli-equivalents per 100 grams of material or centimoles of charge per kilogram of exchanger.

Clay Soil material composed of particles finer than 0.002 mm. When used as a soil texture group such soils contain at least 35% clay.

Composite sample bulking and thorough mixing of soil samples collected from more than one sampling location to form a single soil sample for chemical analysis.

Confidence Limits (statistics) an interval so constructed as to have a prescribed probability of containing the true value of an unknown parameter.

Contaminant generally, any chemical species introduced into the soil or water. More particularly relates to those species that render soil or water unfit for beneficial use.

Contamination is considered to have occurred when the concentration of a specific element or compound is established as being greater than the normally expected (or actually quantified) background concentration.

Discrete sample samples collected from different locations and depths that will not be composited but analysed individually.

Friable (of a rock or mineral) that can be disintegrated into individual grains by finger pressure.

Gradient rate of inclination of a slope. The degree of deviation from the horizontal; also refers to pressure.

Groundwater water held in the pores of an aquifer.

Heavy Metals all metallic elements whose atomic mass exceeds that of calcium (20) and includes lead (Pb), copper (Cu), Zinc (Zn), cadmium (Cd), and tin (Sn).

Leachate water that flows through waste material (or other material) will liberate soluble molecules to form leachate.

Organics chemical compounds comprising atoms of carbon, hydrogen and others (commonly oxygen, nitrogen, phosphorous, sulfur). Opposite is inorganic, referring to chemical species not containing carbon.

Organochlorine pesticides synthetic organic chemicals which are persistent and may bio-accumulate along the food chain.

Parameters population value of a particular characteristic, which is descriptive of the distribution of a random variable.

Phytotoxicity toxic concentration of a substance that is associated with symptoms of toxicity or reduced vigour, growth, and production of a plant.

QA/QC Quality Assurance / Quality Control.

Remediation restoration of land or groundwater contaminated by pollutants, to a state suitable for other, beneficial uses.

Representative Sample assumed not to be significantly different than the population of samples available. In many investigations samples are often collected to represent the worst case situation.

Stratigraphy vertical sequence of geological units.

Topsoil part of the soil profile, typically the A1 horizon, containing material which is usually darker, more fertile and better structured than the underlying layers.

Toxicity the inherent potential or capacity of a material to cause adverse effects in a living organism.

Water table interface between the saturated zone and unsaturated zones. The surface in an aquifer at which pore water pressure is equal to atmospheric pressure.

ENVIRONMENTAL EARTH SCIENCES GENERAL LIMITATIONS

Scope of services

The work presented in this report is Environmental Earth Sciences response to the specific scope of works requested by, planned with and approved by the client. It cannot be relied on by any other third party for any purpose except with our prior written consent. Client may distribute this report to other parties and in doing so warrants that the report is suitable for the purpose it was intended for. However, any party wishing to rely on this report should contact us to determine the suitability of this report for their specific purpose.

Data should not be separated from the report

A report is provided inclusive of all documentation sections, limitations, tables, figures and appendices and should not be provided or copied in part without all supporting documentation for any reason, because misinterpretation may occur.

Subsurface conditions change

Understanding an environmental study will reduce exposure to the risk of the presence of contaminated soil and or groundwater. However, contaminants may be present in areas that were not investigated, or may migrate to other areas. Analysis cannot cover every type of contaminant that could possibly be present. When combined with field observations, field measurements and professional judgement, this approach increases the probability of identifying contaminated soil and or groundwater. Under no circumstances can it be considered that these findings represent the actual condition of the site at all points.

Environmental studies identify actual sub-surface conditions only at those points where samples are taken, when they are taken. Actual conditions between sampling locations differ from those inferred because no professional, no matter how qualified, and no sub-surface exploration program, no matter how comprehensive, can reveal what is hidden below the ground surface. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from that predicted. Nothing can be done to prevent the unanticipated. However, steps can be taken to help minimize the impact. For this reason, site owners should retain our services.

Problems with interpretation by others

Advice and interpretation is provided on the basis that subsequent work will be undertaken by Environmental Earth Sciences NNSW. This will identify variances, maintain consistency in how data is interpreted, conduct additional tests that may be necessary and recommend solutions to problems encountered on site. Other parties may misinterpret our work and we cannot be responsible for how the information in this report is used. If further data is collected or comes to light we reserve the right to alter their conclusions.

Obtain regulatory approval

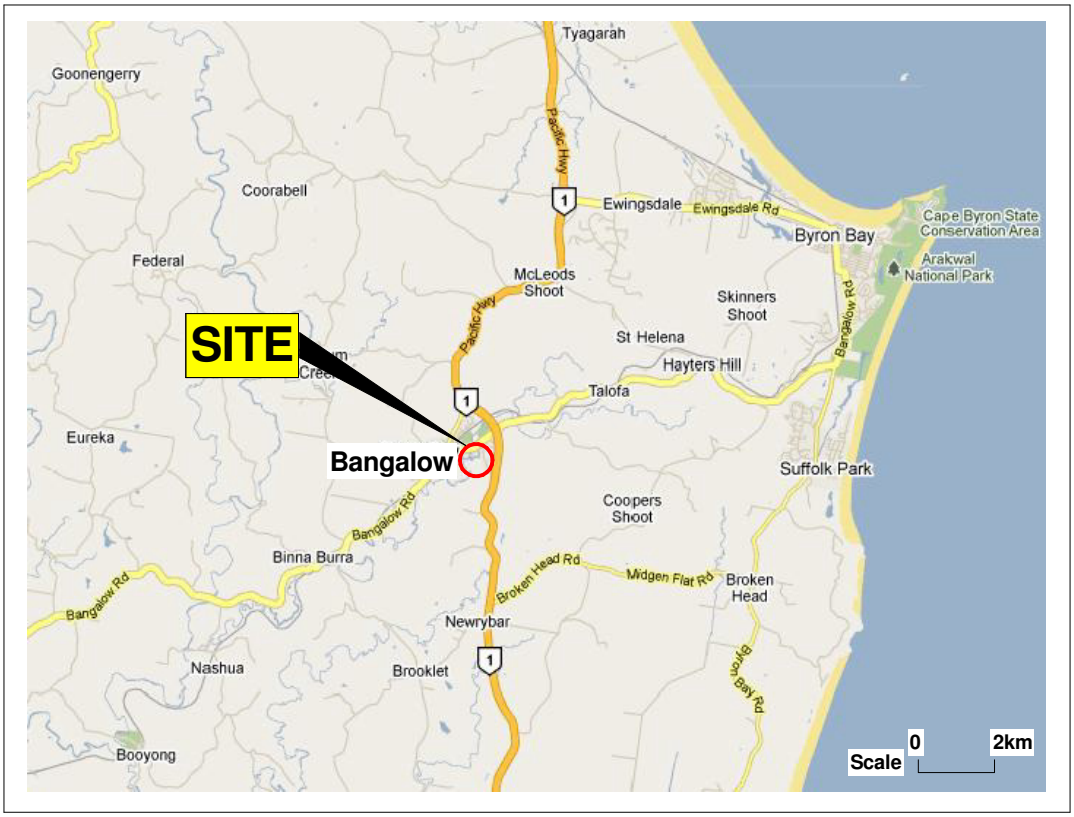
The investigation and remediation of contaminated sites is a field in which legislation and interpretation of legislation is changing rapidly. Our interpretation of the investigation findings should not be taken to be that of any other party. When approval from a statutory authority is required for a project, that approval should be directly sought by the client.

Limit of liability

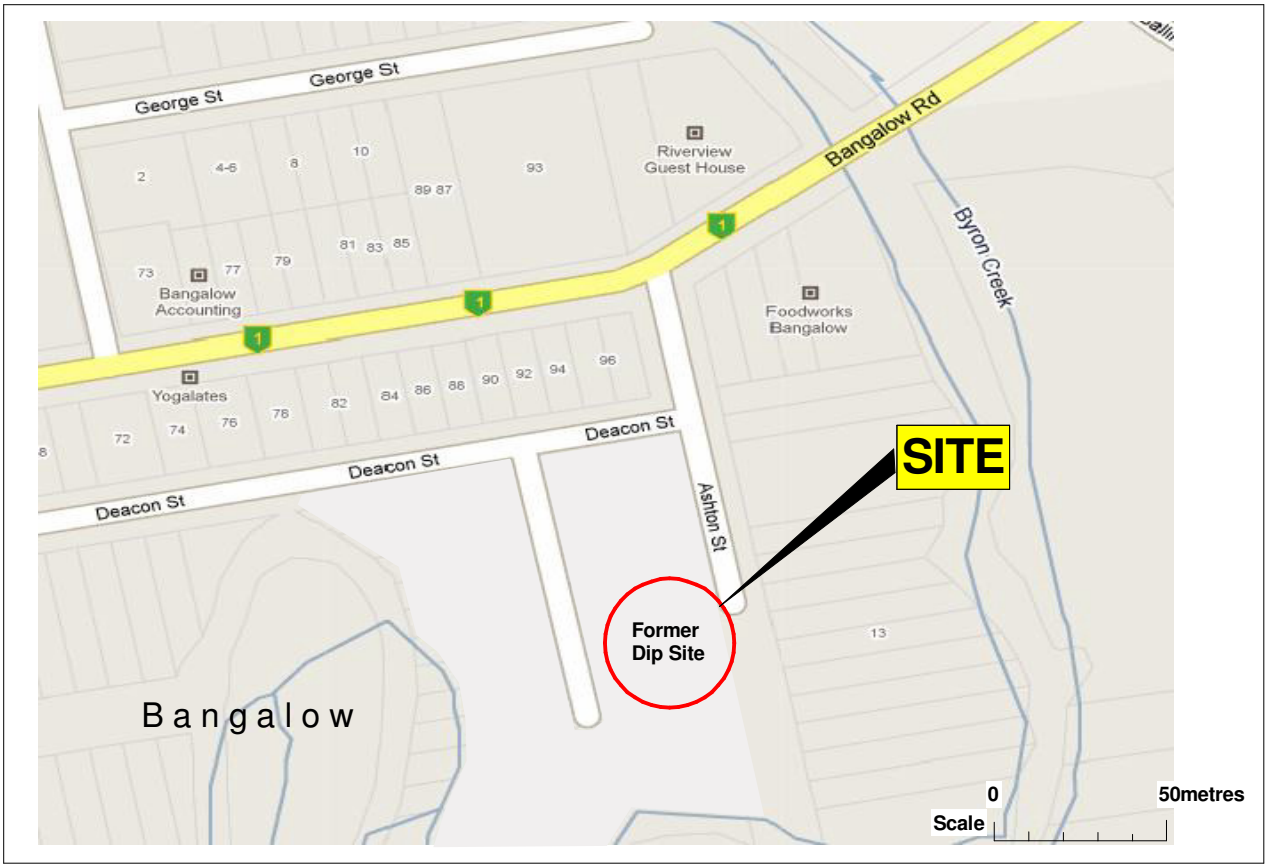
This study has been carried out to a particular scope of works at a specified site and should not be used for any other purpose. This report is provided on the condition that Environmental Earth Sciences NNSW disclaims all liability to any person or entity other than the client in respect of anything done or omitted to be done and of the consequence of anything done or omitted to be done by any such person in reliance, whether in whole or in part, on the contents of this report. Furthermore, Environmental Earth Sciences NNSW disclaims all liability in respect of anything done or omitted to be done and of the consequence of anything done or omitted to be done by the client, or any such person in reliance, whether in whole or any part of the contents of this report of all matters not stated in the brief outlined in Environmental Earth Sciences NNSW's proposal number and according to Environmental Earth Sciences general terms and conditions and special terms and conditions for contaminated sites.

To the maximum extent permitted by law, we exclude all liability of whatever nature, whether in contract, tort or otherwise, for the acts, omissions or default, whether negligent or otherwise for any loss or damage whatsoever that may arise in any way in connection with the supply of services. Under circumstances where liability cannot be excluded, such liability is limited to the value of the purchased service.

FIGURES



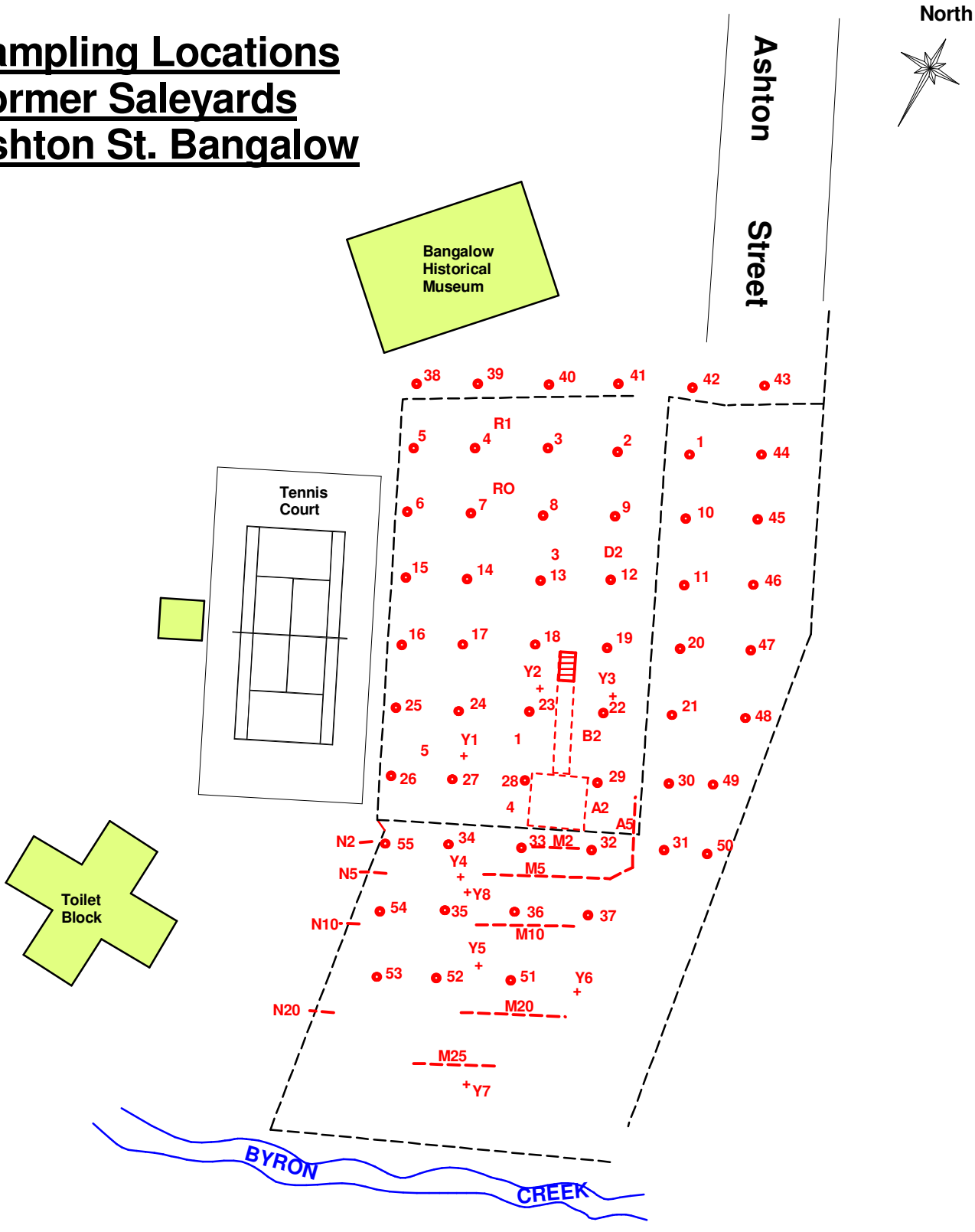
Regional Map



Site Location:

ENVIRONMENTAL EARTH SCIENCES THE KNOW AND THE HOW	Title: Site Locality Map	
	Location: Former Bangalow Saleyards, Ashton Street, Bangalow, NSW	
Client: Byron Shire Council		Job number: 509020
Drawn by: TRJ	Scale: As shown	Source: Google Maps
Proj Man: CP	Date: 30 Nov. 2009	Figure 1

Sampling Locations
Former Saleyards
Ashton St. Bangalow



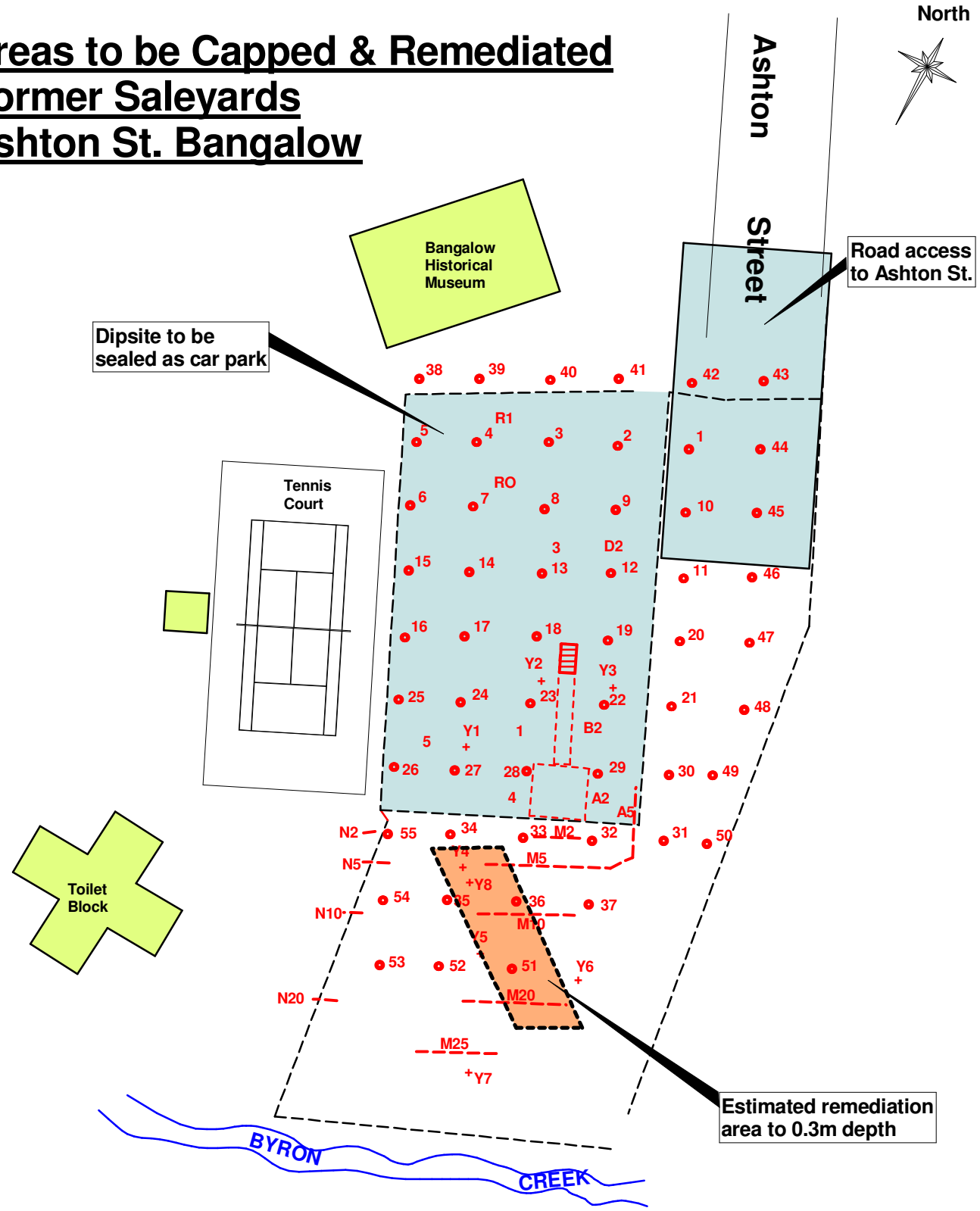
Reference: Plan supplied by NSW Dept. Primary Industries.

0 5 10 15 20 25 30 35m

Scale Approx.

ENVIRONMENTAL EARTH SCIENCES THE KNOW AND THE HOW	Title: Sampling Locations	
	Location: Former Bangalow Saleyards, Ashton Street, Bangalow, NSW	
Client: Byron Shire Council		Job number: 509020
Drawn by: TRJ	Scale: As shown	Source: NSW DPI
Proj Man: CP	Date: 30 Nov. 2009	Figure 2

Areas to be Capped & Remediated
Former Saleyards
Ashton St. Bangalow



Reference: Plan supplied by NSW Dept. Primary Industries.

0 5 10 15 20 25 30 35m

Scale Approx.

ENVIRONMENTAL EARTH SCIENCES THE KNOW AND THE HOW	Title: Areas to be Capped & Remediated	
	Location: Former Bangalow Saleyards, Ashton Street, Bangalow, NSW	
Client: Byron Shire Council		Job number: 509020
Drawn by: TRJ	Scale: As shown	Source: NSW DPI
Proj Man: CP	Date: 30 Nov. 2009	Figure 3

APPENDIX A SUMMARY OF LABORATORY TRANSCRIPTS

RESULTS OF ANALYSES OF SOIL SAMPLES:

Date	Location	Description	Depth (cm)	Arsenic ppm	DDT ppm	Ethion ppm
27.11.91	1	draining yard near bath		660	1800	420
	3	forcing yard near crush		140	2.7	3.5
	4	exit of draining pen		120	330	<1
	5	draining yard		770	19	<1
	A2	external to draining pen		86	5	<1
	B2	external to bath		160	56	400
	D2	external to crush		440	8.9	<1
	M2	external to draining yard		92	25	<1
12.12.91	R0	external to forcing yard		50	0.7	nd
	R1	external to forcing yard		40	0.7	nd
	M2	2 m external draining yard		144	3.8	<0.1
	M5	5 m external draining yard		87	5.8	<0.1
	M10	10 m external draining yard		617	2.3	<0.1
	M20	20 m external draining yard		215	2.5	<0.1
	N2	2 m down drain		138	2.2	<0.1
	N5	5 m down drain		49	0.32	<0.1
	N10	10 m down drain		3	<0.1	<0.1
	N20	20 m down drain		9	<0.1	<0.1
6.5.93	Y1		0 - 25	923	25	<0.1
			50 - 75	542	<0.1	<0.1
			100 - 125	17	<0.1	<0.1
	Y2		0 - 25	2780	1200	4.8
			50 - 75	2290	7.4	<0.1
			75 - 90	414	0.43	<0.1
	Y3		0 - 25	49	1.9	<0.1
			50 - 75	10	<0.1	<0.1
			75 - 90	<0.1	<0.1	<0.1
	Y4		0 - 25	304	24	<0.1
			50 - 75	1	<0.1	<0.1
			75 - 90	1	<0.1	<0.1
	Y5		0 - 25	10	<0.1	<0.1
			50 - 75	<1	<0.1	<0.1
			75 - 90	<1	<0.1	<0.1
	Y6		0 - 25	8	2.3	<0.1
			50 - 75	1	<0.1	<0.1
	Y7		0 - 20	3	<0.1	<0.1
			40 - 60	2	<0.1	<0.1
			80 - 100	<1	<0.1	<0.1

Date	Location	Description				Depth (cm)	Arsenic ppm	DDT ppm	Ethion ppm
24.1.93	M10	+4 m	above drain	0	-	15	30	4.5	-
		+2 m	above drain	0	-	15	1400	2.8	-
		0 m	in drain	0	-	15	2300	4.0	-
		-2 m	below drain	0	-	15	191	0.18	-
	M20	+2 m	above drain	0	-	15	8	<0.1	-
		0 m	above drain	0	-	15	23	2.5	-
		-3 m	below drain	0	-	15	310	3.1	-
		-9 m	below drain	0	-	15	1300	2.2	-
	M25	-3 to +3 m	from drain	0	-	15	255	4.6	-
		-6 m	below drain	0	-	15	93	3.1	-
	Y8	in drain		0	-	30	1500	5.7	-
		in drain		30	-	60	213	4.2	-
		in drain		60	-	90	30	<0.1	-
	A5	adjacent to drain pen		0	-	15	34	550	-

ANALYTICAL RESULTS
FORMER CATTLE TICK DIP SITE – BANGALOW SALEYARD DIP

Sample Date	Location Bore Hole No.	Sample Type	Depth	Analyte	
				Arsenic (mg/kg)	DDT (mg/kg)
9,11,12/8/99	1	Profile	0.00 - .15m	6.6	<.2
			0.15 - .30m	5.8	<.2
			0.30 - .45m		
9,11,12/8/99	2	Profile	0.00 - .15m	3.1	<.2
			0.15 - .30m	11.3	<.2
			0.30 - .45m		
9,11,12/8/99	3	Profile	0.00 - .15m	36	<.2
			0.15 - .30m	127	<.2
			0.30 - .45m		
9,11,12/8/99	4	Profile	0.00 - .15m	20	<.2
			0.15 - .30m	293	<.2
			0.30 - .45m		
9,11,12/8/99	5	Profile	0.00 - .15m	13.7	<.2
			0.15 - .30m	45.9	<.2
			0.30 - .45m		
9,11,12/8/99	6	Profile	0.00 - .15m	70.1	<.2
			0.15 - .30m	58.9	<.2
			0.30 - .45m		
9,11,12/8/99	7	Profile	0.00 - .15m	10.6	<.2
			0.15 - .30m	115	<.2
			0.30 - .45m		
9,11,12/8/99	8	Profile	0.00 - .15m	39.7	.73
			0.15 - .30m	79.7	<.2
			0.30 - .45m		
9,11,12/8/99	9	Profile	0.00 - .15m	69.3	<.2
			0.15 - .30m	17.6	<.2
			0.30 - .45m		
9,11,12/8/99	10	Profile	0.00 - .15m	12.4	<.2
			0.15 - .30m	7.3	<.2
			0.30 - .45m		
9,11,12/8/99	11	Profile	0.00 - .15m	10.7	<.2
			0.15 - .30m	10.1	<.2
			0.30 - .45m		
9,11,12/8/99	12	Profile	0.00 - .15m	219	.25
			0.15 - .30m	8.8	<.2
			0.30 - .45m		
9,11,12/8/99	13	Profile	0.00 - .15m	1250	1.31
			0.15 - .30m	305	<.2
			0.30 - .45m		
9,11,12/8/99	14	Profile	0.00 - .15m	321	.81
			0.15 - .30m	151	<.2
			0.30 - .45m		
9,11,12/8/99	15	Profile	0.00 - .15m	208	1.13
			0.15 - .30m	95.8	<.2
			0.30 - .45m		
9,11,12/8/99	16	Profile	0.00 - .15m	529	1.17
			0.15 - .30m	23.4	<.2
			0.30 - .45m		
9,11,12/8/99	17	Profile	0.00 - .15m	1940	1.14
			0.15 - .30m	21.6	<.2
			0.30 - .45m		

ANALYTICAL RESULTS
FORMER CATTLE TICK DIP SITE – BANGALOW SALEYARD DIP

Sample Date	Location Bore Hole No.	Sample Type	Depth	Analyte	
				Arsenic (mg/kg)	DDT (mg/kg)
9,11,12/8/99	18	Profile	0.00 - .15m	109	4921
			0.15 - .30m	986	<.2
			0.30 - .45m		
9,11,12/8/99	19	Profile	0.00 - .15m	188	12.29
			0.15 - .30m	92.4	<.2
			0.30 - .45m		
9,11,12/8/99	20	Profile	0.00 - .15m	36.9	.36
			0.15 - .30m	11.7	<.2
			0.30 - .45m		
9,11,12/8/99	21	Profile	0.00 - .15m	168	..27
			0.15 - .30m	11.9	<.2
			0.30 - .45m		
9,11,12/8/99	22	Profile	0.00 - .15m	3.7	<.2
			0.15 - .30m	15.6	<.2
			0.30 - .45m		
9,11,12/8/99	23	Profile	0.00 - .15m	3550	12.87
			0.15 - .30m	580	<.2
			0.30 - .45m		
9,11,12/8/99	24	Profile	0.00 - .15m	532	.27
			0.15 - .30m	41.6	<.2
			0.30 - .45m		
9,11,12/8/99	25	Profile	0.00 - .15m	1450	.58
			0.15 - .30m	190	<.2
			0.30 - .45m		
9,11,12/8/99	26	Profile	0.00 - .15m	2770	1.26
			0.15 - .30m	24.5	<.2
			0.30 - .45m		
9,11,12/8/99	27	Profile	0.00 - .15m	2710	.26
			0.15 - .30m	205	<.2
			0.30 - .45m		
9,11,12/8/99	28	Profile	0.00 - .15m	1610	328.27
			0.15 - .30m	28.1	<.2
			0.30 - .45m		
9,11,12/8/99	29	Profile	0.00 - .15m	306	1.06
			0.15 - .30m	110	<.2
			0.30 - .45m		
9,11,12/8/99	30	Profile	0.00 - .15m	227	.78
			0.15 - .30m	16.6	<.2
			0.30 - .45m		
9,11,12/8/99	31	Profile	0.00 - .15m	39	<.2
			0.15 - .30m	13.3	<.2
			0.30 - .45m		
9,11,12/8/99	32	Profile	0.00 - .15m	75.5	.28
			0.15 - .30m	19.4	<.2
			0.30 - .45m		
9,11,12/8/99	33	Profile	0.00 - .15m	28.5	<.2
			0.15 - .30m	12.2	<.2
			0.30 - .45m		
9,11,12/8/99	34	Profile	0.00 - .15m	84.1	<.2
			0.15 - .30m	13.3	<.2
			0.30 - .45m		

ANALYTICAL RESULTS
FORMER CATTLE TICK DIP SITE – BANGALOW SALEYARD DIP

Sample Date	Location Bore Hole No.	Sample Type	Depth	Analyte	
				Arsenic (mg/kg)	DDT (mg/kg)
20/12/99	52	Profile	0.00 - .15m	14.2	<1
			0.15 - .30m	4.5	<1
			0.30 - .45m	3.5	<1
20/12/99	53	Profile	0.00 - .15m	16.4	<1
			0.15 - .30m	5.6	<1
			0.30 - .45m		<1
20/12/99	54	Profile	0.00 - .15m	5	<1
			0.15 - .30m	2.1	<1
			0.30 - .45m	2.8	<1
20/12/99	55	Profile	0.00 - .15m	84.9	<1
			0.15 - .30m	6.7	<1
			0.30 - .45m	3.2	<1

Comments:
Unable to extract soil below 0.15m at Bore Hole 40 due to gravel.

Bore Holes 49 and 50 shifted due to Lantana.

ENVIRONMENTAL GUARANTEED TESTING

AGRICULTURE

Page-no: 1

ENV BRISBANE

Batch-no: 23214
Sub-batch: 0
No-samples: 37
Received: 10/08/99
Checked:

ttention: MR R BLACK
rOrder: 99-615
pleType: SOIL
roject: BANGALO

	Element	As
	Unit	mg/kg
	Method	EA-055
	0.0-150m	09/08/99 6.6
	0.0-150m	09/08/99 3.1
BAN3/1/	0.0-150m	09/08/99 36.0
BAN4/1/	0.0-150m	09/08/99 20.8
BAN5/1/	0.0-150m	09/08/99 13.7
BAN6/1/	0.0-150m	09/08/99 70.1
BAN7/1/	0.0-150m	09/08/99 10.6
BAN8/1/	0.0-150m	09/08/99 19.7
BAN9/1/	0.0-150m	09/08/99 69.3
BAN10/1/	0.0-150m	09/08/99 12.4
BAN11/1/	0.0-150m	09/08/99 10.7
BAN12/1/	0.0-150m	09/08/99 219
BAN13/1/	0.0-150m	09/08/99 1250
BAN14/1/	0.0-150m	09/08/99 321
BAN15/1/	0.0-150m	11/08/99 208
BAN16/1/	0.0-150m	11/08/99 528
BAN17/1/	0.0-150m	11/08/99 1940
BAN18/1/	0.0-150m	11/08/99 109
BAN19/1/	0.0-150m	11/08/99 283
BAN20/1/	0.0-150m	11/08/99 36.9
BAN21/1/	0.0-150m	11/08/99 268
BAN22/1/	0.0-150m	11/08/99 3.7
BAN23/1/	0.0-150m	11/08/99 3550
BAN24/1/	0.0-150m	11/08/99 532
BAN25/1/	0.0-150m	11/08/99 1450
BAN26/1/	0.0-150m	11/08/99 2770
BAN27/1/	0.0-150m	11/08/99 2710
BAN28/1/	0.0-150m	11/08/99 1810
BAN29/1/	0.0-150m	11/08/99 206
BAN30/1/	0.0-150m	11/08/99 227
BAN31/1/	0.0-150m	11/08/99 38.0
[illegible]	[illegible]	[illegible]
1/1/	0.0-150m	12/08/99 28.5
/1/	0.0-150m	12/08/99 84.1
BAN35/1/	0.0-150m	12/08/99 172
BAN36/1/	0.0-150m	12/08/99 21.6
BAN37/1/	0.0-150m	12/08/99 53.4

LOR 0.5

Samples crushed and pulverised prior to digestion by USEPA method 3051. Results reported on a dry weight basis.

AUSTRALIAN LABORATORY SERVICES P/L
A.C.N. 009 936 029

Brisbane
Phone (07) 3243 7222
Fax (07) 3243 7218

Sydney
Phone (02)9647 9300
Fax (02)9647 9338

Melbourne
Phone (03)9538 4444
Fax (03)9538 4480

Perth Laboratory
Phone (08) 349 7888
Fax (08) 349 2942

ENVIRONMENTAL
GUARANTEED TESTING

NSW AGRICULTURE

Attention: MR V WARREN
YourOrder: 99-115
SampleType: SOIL
Project: BANRALOW

Page-no: 1
ENV BRISBANE
Batch-no: 23214
Sub-batch: 1
No-samples: 37
Received: 18/08/99
Checked:

Method	Analysis description	Units	LOR	BAN1/1/ 0.0-150m 05/08/99	BAN2/1/ 0.0-150m 05/08/99	BAN3/1/ 0.0-150m 09/08/99
EA-055	Moisture Content (dried @ 103'	%	0.1	12.5	16.5	20.7
EP-068A-SS	ORGANOCHLORINE PESTICIDES					
EP-068A-SS	DDE	mg/kg	0.05	<0.05	<0.05	0.07
EP-068A-SS	DDD	mg/kg	0.05	<0.05	<0.05	<0.05
EP-068A-SS	DDT	mg/kg	0.2	<0.2	<0.2	<0.2
EP-068B-SS	ORGANOPHOSPHORUS PESTICIDES					
EP-068E-SS	Ethion	mg/kg	0.05	<0.05	<0.05	<0.05
EP-068E-SS	MISC PESTICIDES					
EP-068E-SS	2,4'-DDT	mg/kg	0.2	<0.2	<0.2	<0.2
EP-068S-SS	ORGANOCHLORINE PESTICIDE SURRO					
EP-068S-SS	Dibromo-DDE	%	1	64	60	65
EP-068T-SS	ORGANOPHOSPHORUS PESTICIDE SUR					
EP-068T-SS	DEF	%	1	70	66	70

DDT = <0.2 <0.2 <0.2

Samples analysed on an as rec'd basis. Rslts rep'd on a dry wt basis. Rslts rep'd as "Not Det'd" were unable to be analysed due to sample matrix. Samples BAN18/1/0.0-150m and BAN19/1/0.0-150m req'd dil'n prior to analysis due to matrix interferences. LOR values have been adjusted accordingly.....See overleaf

AUSTRALIAN LABORATORY SERVICES P/L
A.C.N. 009 936 029

Brisbane
Phone (07) 3243 7222
Fax (07) 3243 7218

Sydney
Phone (02)9841 9600
Fax (02)9841 9630

Melbourne
Phone (03)9538 4444
Fax (03)9538 4400

Perth Laboratory
Phone (09) 249 2988
Fax (09) 249 2942

ENVIRONMENTAL
GUARANTEED TESTING

NSW AGRICULTURE

Attention: MR R BLACK
YourOrder: 99-615
SampleType:SOIL
Project: BANGALOW

Page-no: 2
ENV BRISBANE
Batch-no: 23214
Sub-Batch:1
No-samples:37
Received: 18/08/99
Checked:

Method	Analysis description	Units	LOR	BAN4/1/ 0.0-150m 09/08/99	BAN5/1/ 0.0-150m 09/08/99	BAN6/1/ 0.0-150m 09/08/99
EA-055	Moisture Content (dried @ 103°	%	0.1	20.1	13.9	13.7
EP-068A-SS	ORGANOCHLORINE PESTICIDES					
EP-068A-SS	DDE	mg/kg	0.05	<0.05	0.07	0.14
EP-068A-SS	DDD	mg/kg	0.05	<0.05	<0.05	<0.05
EP-068A-SS	DDT	mg/kg	0.2	<0.2	<0.2	<0.2
EP-068B-SS	ORGANOPHOSPHORUS PESTICIDES					
EP-068B-SS	Ethion	mg/kg	0.05	<0.05	<0.05	<0.05
EP-068E-SS	MISC PESTICIDES					
EP-068E-SS	2,4'-DDT	mg/kg	0.2	<0.2	<0.2	<0.2
EP-068S-SS	ORGANOCHLORINE PESTICIDE SURRO					
EP-068S-SS	Dibromo-DDE	%	1	51	66	61
EP-068T-SS	ORGANOPHOSPHORUS PESTICIDE SUR					
EP-068T-SS	DEF	%	1	63	70	66

This report supersedes any previous preliminary reports of the same batch number.

ENVIRONMENTAL
GUARANTEED TESTING

NSW AGRICULTURE

Attention: MR V WARRAN
YourOrder: 03-615
SampleType: SOIL
Project: MANGALON

Page-no: 3
ENV BRISBANE
Batch-no: 23214
Sub-batch: 1
No-samples: 37
Received: 10/08/99
Checked:

Method	Analysis description	Units	LOR	BAN7/1/ 0.0-150m 08/08/99	BAN8/1/ 0.0-150m 09/08/99	BAN9/1/ 0.0-150m 09/08/99
EA-055	Moisture Content (dried @ 103°	%	0.1	16.0	22.0	21.8
EP-068A-SS	ORGANOCHLORINE PESTICIDES					
EP-068A-SS	DDE	mg/kg	0.05	<0.05	0.67	0.16
EP-068A-SS	DDD	mg/kg	0.05	<0.05	0.06	<0.05
EP-068A-SS	DDT	mg/kg	0.2	<0.2	<0.2	<0.2
EP-068B-SS	ORGANOPHOSPHORUS PESTICIDES					
EP-068B-SS	Chlorpyrifos	mg/kg	0.05	<0.05	<0.05	<0.05
EP-068E-SS	USC PESTICIDES					
EP-068E-SS	t.4-DDT	mg/kg	0.2	<0.2	<0.2	<0.2
EP-068S-SS	ORGANOCHLORINE PESTICIDE SURRO					
EP-068S-SS	Dibromo-DDE	%	1	59	62	56
EP-068T-SS	ORGANOPHOSPHORUS PESTICIDE SUR					
EP-068T-SS	DEF	%	1	66	67	64

DDT = <0.2 0.73 <0.2

ENVIRONMENTAL
GUARANTEED TESTING

SW AGRICULTURE

Attention: MR R BLACK
OurOrder: 99-615
SampleType: SOIL
Project: BANGALAN

Page-no: 4
ENV BRISBANE
Batch-no: 23214
Sub-batch: 1
No-samples: 37
Received: 18/08/99
Checked:

Method	Analysis description	Units	LOR	BAN10/1/ 0.0-150m 09/08/99	BAN11/1/ 0.0-150m 09/08/99	BAN12/1/ 0.0-150m 09/08/99
EA-055	Moisture Content (dried @ 103°	%	0.1	22.1	21.9	20.9
EP-068A-SS	ORGANOCHLORINE PESTICIDES					
EP-068A-SS	DDE	mg/kg	0.05	<0.05	<0.05	<0.05
EP-068A-SS	DDD	mg/kg	0.05	<0.05	<0.05	<0.05
EP-068A-SS	DDT	mg/kg	0.2	<0.2	<0.2	<0.2
EP-068B-SS	ORGANOPHOSPHORUS PESTICIDES					
EP-068B-SS	Ethion	mg/kg	0.05	<0.05	<0.05	<0.05
EP-068E-SS	MISC PESTICIDES					
EP-068E-SS	2,4-DDT	mg/kg	0.2	<0.2	<0.2	<0.2
EP-068S-SS	ORGANOCHLORINE PESTICIDE SURRO	%	1	51	53	52
EP-068S-SS	Dibromo-DDE					
EP-068T-SS	ORGANOPHOSPHORUS PESTICIDE SUR	%	1	47	52	50
EP-068T-SS	DEF					

ENVIRONMENTAL
GUARANTEED TESTING

NSW AGRICULTURE

Attention: MR V WARRAN
YourOrder: 99-615
SampleType: SOIL
Project: BARGALOW

Page-no: 5
ENV BRISBANE
Batch-no: 23214
Sub-batch:1
No-samples:37
Received: 10/08/99
Checked:

Method	Analysis description	Units	LOR	BAN13/1/ 0.0-150m 09/08/99	BAN14/1/ 0.0-150m 09/08/99	BAN15/1/ 0.0-150m 11/08/99
EA-055	Moisture Content (dried @ 103°	%	0.1	31.9	18.4	12.9
EP-068A-SS	ORGANOCHLORINE PESTICIDES					
EP-068A-SS	DDT	mg/kg	0.05	0.60	0.28	0.41
EP-068A-SS	DDD	mg/kg	0.05	0.21	0.13	0.12
EP-068A-SS	DDE	mg/kg	0.2	0.5	0.4	0.6
EP-068B-SS	ORGANOPHOSPHORUS PESTICIDES					
EP-068B-SS	Methidathion	mg/kg	0.05	<0.05	<0.05	<0.05
EP-068E-SS	MISC PESTICIDES					
EP-068E-SS	2,4-DDT	mg/kg	0.2	0.8	<0.2	<0.2
EP-068S-SS	ORGANOCHLORINE PESTICIDE SURRO					
EP-068S-SS	Dibromo-DDE	%	1	63	64	81
EP-068T-SS	ORGANOPHOSPHORUS PESTICIDE SUR					
EP-068T-SS	DEF	%	1	Not Det'd	Not Det'd.	Not Det'd

DDT = 1.31 0.61 1.13

AUSTRALIAN LABORATORY SERVICES P/L
A.C.N. 009 936 029

Brisbane
Phone (07) 3243 7222
Fax (07) 3243 7218

Sydney
Phone (02)9841 9500
Fax (02)9841 9530

Melbourne
Phone (03)9538 4444
Fax (03)9538 4400

Perth Laboratory
Phone (08) 249 2508
Fax (08) 249 2942

ENVIRONMENTAL GUARANTEED TESTING

NSW AGRICULTURE

Attention: MR R BLACK
YourOrder: 99-615
SampleType: SOIL
Project: BANGALOW

Page-no: 6
ENV BRISBANE
Batch-no: 23214
Sub-batch: 1
No-samples: 37
Received: 18/08/99
Checked:

Method	Analysis description	Units	LOR	BAN16/1/ 0.0-150m 11/08/99	BAN17/1/ 0.0-150m 11/08/99	BAN18/1/ 0.0-150m 11/08/99
EA-055	Moisture Content (dried @ 103°	%	0.1	28.6	29.6	15.7
EP-068A-SS	ORGANOCHLORINE PESTICIDES					
EP-068A-SS	DDE	mg/kg	0.05	0.72	0.78	41.5
EP-068A-SS	DDD	mg/kg	0.05	0.05	0.06	150
EP-068A-SS	DDT	mg/kg	0.2	0.4	0.3	4730
EP-068B-SS	ORGANOPHOSPHORUS PESTICIDES					
EP-068B-SS	Ethion	mg/kg	0.05	<0.05	<0.05	<10.0
EP-068E-SS	MISC PESTICIDES					
EP-068E-SS	2,4-DDT	mg/kg	0.2	<0.2	<0.2	40.5
EP-068S-SS	ORGANOCHLORINE PESTICIDE SURRO					
EP-068S-SS	Dibromo-DDE	%	1	48	57	Not Det'd
EP-068T-SS	ORGANOPHOSPHORUS PESTICIDE SUR					
EP-068T-SS	DEF	%	1	Not Det'd	Not Det'd	Not Det'd

ENVIRONMENTAL
GUARANTEED TESTING

NSW AGRICULTURE

Attention: MR V WARRAN
YourOrder: 99-615
SampleType:SOIL
Project: BANGALOW

Page-no: 7
EAP BRISBANE
Batch-no: 23214
Sub-batch:1
No-samples:37
Received: 10/08/99
Checked:

Method	Analysis description	Units	LOR	BAN18/1/ 0.0-150m 11/08/99	BAN20/1/ 0.0-150m 11/08/99	BAN21/1/ 0.0-150m 11/08/99
EA-055	Moisture Content (dried @ 103°	%	0.1	28.3	31.0	31.6
EP-068A-SS	ORGANOCHLORINE PESTICIDES					
EP-068A-SS	DDE	ug/kg	0.05	1.71	0.06	0.27
EP-068A-SS	ODD	ug/kg	0.05	1.38	<0.05	<0.05
EP-068A-SS	DDT	ug/kg	0.2	9.2	0.3	<0.2
EP-068B-SS	ORGANOPHOSPHORUS PESTICIDES					
EP-068B-SS	Ethion	mg/kg	0.05	<0.05	<0.05	<0.05
EP-068E-SS	MISC. PESTICIDES					
EP-068E-SS	2,4-DDT	mg/kg	0.2	<0.2	<0.2	<0.2
EP-068S-SS	ORGANOCHLORINE PESTICIDE SURRO	%	1	Not Det'd	64	50
EP-068S-SS	Dibromo-DDE					
EP-068T-SS	ORGANOPHOSPHORUS PESTICIDE SUR	%	1	Not Det'd	Not Det'd	Not Det'd
EP-068T-SS	DEF					

DDT = 12.29 0.36 0.27

AUSTRALIAN LABORATORY SERVICES P/L
A.C.N. 009 936 029

Brisbane
Phone (07) 3243 7222
Fax (07) 3243 7218

Sydney
Phone (02)9841 4500
Fax (02)9841 9530

Melbourne
Phone (03)9538 4444
Fax (03)9538 4480

South Laboratory
Phone (03) 249 2500
Fax (07) 249 2542

ENVIRONMENTAL
GUARANTEED TESTING

NSW AGRICULTURE

Attention: MR R BLACK
YourOrder: 99-615
SampleType:SOIL
Project: BANGALOW

Page-no: 8
ENV BRISBANE
Batch-no: 22214
Sub-batch:1
No-samples:37
Received: 10/08/99
Checked:

Method	Analysis description	Units	LOR	BAN22/1/ 0.0-150m 11/08/99	BAN23/1/ 0.0-150m 11/08/99	BAN24/1/ 0.0-150m 11/08/99
EA-055	Moisture Content (dried @ 103°	%	0.1	19.1	28.9	35.1
EP-068A-SS	ORGANOCHLORINE PESTICIDES					
EP-068A-SS	DDE	mg/kg	0.05	<0.05	1.31	0.27
EP-068A-SS	DDD	mg/kg	0.05	<0.05	0.66	<0.05
EP-068A-SS	DDT	mg/kg	0.2	<0.2	10.9	<0.2
EP-068B-SS	ORGANOPHOSPHORUS PESTICIDES					
68B-SS	Ethion	mg/kg	0.05	<0.05	<0.05	<0.05
EP-068E-SS	HCB PESTICIDES					
EP-068E-SS	2,4'-DDT	mg/kg	0.2	<0.2	0.2	<0.2
EP-068S-SS	ORGANOCHLORINE PESTICIDE SURRO					
EP-068S-SS	Dibromo-DDE	%	1	52	81	48
EP-068T-SS	ORGANOPHOSPHORUS PESTICIDE SUR					
EP-068T-SS	DEP	%	1	Not Det'd	Not Det'd	Not Det'd

AUSTRALIAN LABORATORY SERVICES P/L
A.C.N. 009 936 029

Brisbane
Phone (07) 3243 7222
Fax (07) 3243 7218

Sydney
Phone (02)9541 9500
Fax (02)9541 9530

Melbourne
Phone (03)9538 4444
Fax (03)9538 4400

Perth Laboratory
Phone (09) 249 2368
Fax (09) 249 2342

ENVIRONMENTAL GUARANTEEDTESTING

NSW AGRICULTURE

Attention: MR V WARRAN
YourOrder: 99-419
SampleType:SOIL
Project: BANKSIA

Page-no: 9
KNY BRISBANE
Batch-no: Z8214
Sub-batch:1
No-samples:37
Received: 18/08/99
Checked:

Method	Analysis description	Units	LOR	BAN25/1/ 0.0-150m 11/08/99	BAN26/1/ 0.0-150m 11/08/99	BAN27/1/ 0.0-150m 11/08/99
EA-055	Moisture Content (dried @ 103°	%	0.1	28.5	23.6	24.0
EP-068A-SS	ORGANOCHLORINE PESTICIDES					
EP-068A-SS	DDE	mg/kg	0.05	0.28	0.64	0.26
EP-068A-SS	DDD	mg/kg	0.05	<0.05	0.12	<0.05
EP-068A-SS	DDT	mg/kg	0.2	0.3	0.5	<0.2
EP-068B-SS	ORGANOPHOSPHORUS PESTICIDES					
EP-068B-SS	Malathion	mg/kg	0.05	<0.05	0.14	0.08
EP-068E-SS	MISC PESTICIDES					
EP-068E-SS	2,4-DDT	mg/kg	0.2	<0.2	<0.2	<0.2
EP-068S-SS	ORGANOCHLORINE PESTICIDE SURRO	%	1	64	63	51
EP-068S-SS	Dibromo-DDE					
EP-068T-SS	ORGANOPHOSPHORUS PESTICIDE SUR	%	1	66	64	Not Det'd
EP-068T-SS	DEF					

DDT = 0.58 1.26 0.26

ENVIRONMENTAL
GUARANTEED TESTING

DSW AGRICULTURE

Attention: MR R BLACK
YourOrder: 99-635
SampleType: SOIL
Project: BANGALOW

Page-no: 10
ENV BRISBANE
Batch-no: 23214
Sub-batch: 1
No-samples: 37
Received: 10/08/99
Checked:

Method	Analysis description	Units	LOR	BAN28/1/ 0.0-150m 11/08/99	BAN29/1/ 0.0-150m 11/08/99	BAN30/1/ 0.0-150m 11/08/99
EA-055	Moisture Content (dried @ 103'	%	0.1	20.2	24.7	35.3
EP-068A-SS	ORGANOCHLORINE PESTICIDES					
EP-068A-SS	DDE	mg/kg	0.05	2.36	0.55	0.66
EP-068A-SS	DDD	mg/kg	0.05	8.91	0.11	0.12
EP-068A-SS	DDT	mg/kg	0.2	317	0.4	<0.2
EP-068B-SS	ORGANOPHOSPHORUS PESTICIDES					
EP-068B-SS	Ethion	mg/kg	0.05	<0.50	<0.05	<0.05
EP-068E-SS	MISC PESTICIDES					
EP-068E-SS	2,4-DDT	mg/kg	0.2	3.3	<0.2	<0.2
EP-068S-SS	ORGANOCHLORINE PESTICIDE SURRO					
EP-068S-SS	Dibromo-DDE	%	1	Not Det'd	47	43
EP-068T-SS	ORGANOPHOSPHORUS PESTICIDE SUR					
EP-068T-SS	DEP	%	1	Not Det'd	Not Det'd	Not Det'd

AUSTRALIAN LABORATORY SERVICES P/L
A.C.N. 009 936 029

Brisbane
Phone (07) 3243 7222
Fax (07) 3243 7218

Sydney
Phone (02)9841 9600
Fax (02)9841 9630

Melbourne
Phone (03)9538 4444
Fax (03)9538 4400

Perth Laboratory
Phone (08) 249 2908
Fax (08) 249 2942

ENVIRONMENTAL
GUARANTEED TESTING

NSW AGRICOLTURE

Attention: MR V NEKRAN
YourOrder: 9[illegible]-615
SampleType:SOIL
Project: BUNGALOW

Page-no: 11
KNY BRISBANE
Batch-no: 23214
Sub-batch:1
No-samples:37
Received: 18/08/99
Checked:

Method	Analysis description	Units	LOR	BAN31/1/ 0.0-150m 12/08/99	BAN32/1/ 0.0-150m 12/08/99	BAN33/1/ 0.0-150m 12/08/99
EA-055	Moisture Content (dried @ 103°	%	0.1	29.2	30.6	32.9
EP-068A-SS	ORGANOCHLORINE PESTICIDES					
EP-068A-SS	DDE	mg/kg	0.05	0.12	0.28	<0.05
EP-068A-SS	DDD	mg/kg	0.05	<0.05	<0.05	<0.05
EP-068A-SS	DDT	mg/kg	0.2	<0.2	<0.2	<0.2
EP-068B-SS	ORGANOPHOSPHORUS PESTICIDES					
EP-068B-SS	Dichlon	mg/kg	0.05	<0.05	<0.05	<0.05
EP-068E-SS	MISC PESTICIDES					
EP-068E-SS	2,4-DDT	mg/kg	0.2	<0.2	<0.2	<0.2
EP-068S-SS	ORGANOCHLORINE PESTICIDE SURRO	%	1	41	56	53
EP-068S-SS	Dibromo-DDE					
EP-068T-SS	ORGANOPHOSPHORUS PESTICIDE SUR	%	1	Not Det'd	Not Det'd	Not Det'd
EP-068T-SS	DEF					

DDT = <0.2 0.28 <0.2

AUSTRALIAN LABORATORY SERVICES P/L
A.C.N. 009 936 029

Brisbane
Phone (07) 3243 7222
Fax (07) 3243 7218

Sydney
Phone (02)9841 9600
Fax (02)9841 9630

Melbourne
Phone (03)9538 4444
Fax (03)9538 4480

Perth Laboratory
Phone (08) 240 2988
Fax (08) 240 2942

ENVIRONMENTAL
GUARANTEED TESTING

NSW AGRICULTURE

Attention: MR R BLACK
YourOrder: 99-615
SampleType: SOIL
Project: BANGALOW

Page-no: 12
ENV BRISBANE
Batch-no: 23216
Sub-batch:1
No-samples:37
Received: 19/08/99
Checked:

Method	Analysis description	Units	LOR	BAN34/1/ 0.0-150m 12/08/99	BAN35/1/ 0.0-150m 12/08/99	BAN36/1/ 0.0-150m 12/08/99
EA-035	Moisture Content (dried @ 103°	%	0.1	29.5	34.9	32.1
EP-068A-SS	ORGANOCHLORINE PESTICIDES					
EP-068A-SS	DDE	mg/kg	0.05	<0.05	0.31	<0.05
EP-068A-SS	DDD	mg/kg	0.05	<0.05	<0.05	<0.05
EP-068A-SS	DDT	mg/kg	0.2	<0.2	0.3	<0.2
EP-068B-SS	ORGANOPHOSPHORUS PESTICIDES					
EP-068B-SS	Ethion	mg/kg	0.05	<0.05	<0.05	<0.05
EP-068E-SS	MISC PESTICIDES					
EP-068E-SS	2,4-DDT	mg/kg	0.2	<0.2	<0.2	<0.2
EP-068S-SS	ORGANOCHLORINE PESTICIDE SURRO					
EP-068S-SS	Dibromo-DDE	%	1	63	79	52
EP-068T-SS	ORGANOPHOSPHORUS PESTICIDE SUR					
EP-068T-SS	DEF	%	1	Not Det'd	Not Det'd	Not Det'd

ENVIRONMENTAL
GUARANTEED TESTING

NSW AGRICULTURE

Attention: MR V FARRAN
YourOrder: 99-015
SampleType:SOIL
Project: BANKALOW

Page-no: 13
ENV BRISBANE
Batch-no: 23214
Sub-batch:1
No-samples:37
Received: 18/08/99
Checked:

Method	Analysis description	Units	LOR	BANK7/1/ 0.0-150m 12/08/99
EA-055	Moisture Content (dried @ 103'	%	0.1	37.3
EP-068A-SS	ORGANOCHLORINE PESTICIDES			
EP-068A-SS	DDE	mg/kg	0.05	0.47
EP-068A-SS	DDT	mg/kg	0.05	<0.05
EP-068A-SS	DDD	mg/kg	0.2	<0.2
EP-068B-SS	ORGANOPHOSPHORUS PESTICIDES			
EP-068B-SS	Fenthion	mg/kg	0.05	<0.05
EP-068E-SS	MISC PESTICIDES			
EP-068E-SS	2,4-DDT	mg/kg	0.2	<0.2
EP-068S-SS	ORGANOCHLORINE PESTICIDE SURRO	%	1	81
EP-068S-SS	Dibromo-DDE			
EP-068T-SS	ORGANOPHOSPHORUS PESTICIDE SUR	%	1	Not Det'd
EP-068T-SS	DEF			

DDT = 0.47

AUSTRALIAN LABORATORY SERVICES P/L
A.C.N. 009 936 029

Brisbane
Phone (07) 3243 7222
Fax (07) 3243 7218

Sydney
Phone (02)9841 9500
Fax (02)9841 9530

Melbourne
Phone (03)9538 4444
Fax (03)9538 4480

Perth Laboratory
Phone (08) 249 2988
Fax (08) 249 2942

DIAGNOSTIC & ANALYTICAL SERVICES
Environmental Centre of Excellence,
Wollongbar/Lismore

NSW Agriculture

elizabeth@bennett

IS:JRS

Chemical Residue Laboratories
PO Box 285 LISMORE 2480
Phone: 02 6621 2632 Fax: 02 6621 4319

Our reference: CRL 99/932 00/50/2
Your reference:

Larry Falls
Cattle Tick Control
WOLLONGBAR NSW 2477

RECEIVED 24 JAN 2000 CATTLE TICK CONTROL

Subject: Dip-Soil Samples - Bangalow Dip
Received: 21-12-99

The samples submitted in connection with the above have been analysed with the following results. As samples were not taken by the laboratory no responsibility is accepted for sampling.

Lab No.	Sample ID	DDE	DDD	DDT	Total DDT	Ethion
349	Soil BAN38-1/0.00-0.15	<1.0	<1.0	<1.0	<1.0	<1.0
349	Soil BAN38-2/0.15-0.30	<1.0	<1.0	<1.0	<1.0	<1.0
349	Soil BAN38-3/0.30-0.45	<1.0	<1.0	<1.0	<1.0	<1.0
349	Soil BAN39-1/0.00-0.15	<1.0	<1.0	<1.0	<1.0	<1.0
349	Soil BAN39-2/0.15-0.30	<1.0	<1.0	<1.0	<1.0	<1.0
349	Soil BAN39-3/0.30-0.45	<1.0	<1.0	<1.0	<1.0	<1.0
350	Soil BAN40-1/0.00-0.15	<1.0	<1.0	<1.0	<1.0	<1.0
350	Soil BAN41-1/0.00-0.15	<1.0	<1.0	<1.0	<1.0	<1.0
350	Soil BAN41-2/0.15-0.30	<1.0	<1.0	<1.0	<1.0	<1.0
350	Soil BAN41-3/0.30-0.45	<1.0	<1.0	<1.0	<1.0	<1.0
350	Soil BAN42-1/0.00-0.15	<1.0	<1.0	<1.0	<1.0	<1.0
350	Soil BAN42-2/0.15-0.30	<1.0	<1.0	<1.0	<1.0	<1.0
350	Soil BAN42-3/0.30-0.45	<1.0	<1.0	<1.0	<1.0	<1.0
350	Soil BAN43-1/0.00-0.15	<1.0	<1.0	<1.0	<1.0	<1.0
350	Soil BAN43-2/0.15-0.30	<1.0	<1.0	<1.0	<1.0	<1.0
350	Soil BAN43-3/0.30-0.45	<1.0	<1.0	<1.0	<1.0	<1.0
351	Soil BAN44-1/0.00-0.15	<1.0	<1.0	<1.0	<1.0	<1.0
351	Soil BAN44-2/0.15-0.30	<1.0	<1.0	<1.0	<1.0	<1.0
351	Soil BAN44-3/0.30-0.45	<1.0	<1.0	<1.0	<1.0	<1.0
351	Soil BAN45-1/0.00-0.15	<1.0	<1.0	<1.0	<1.0	<1.0
351	Soil BAN45-2/0.15-0.30	<1.0	<1.0	<1.0	<1.0	<1.0
351	Soil BAN45-3/0.30-0.45	<1.0	<1.0	<1.0	<1.0	<1.0
351	Soil BAN46-1/0.00-0.15	<1.0	<1.0	<1.0	<1.0	<1.0
351	Soil BAN46-2/0.15-0.30	<1.0	<1.0	<1.0	<1.0	<1.0
351	Soil BAN46-3/0.30-0.45	<1.0	<1.0	<1.0	<1.0	<1.0
351	Soil BAN47-1/0.00-0.15	<1.0	<1.0	<1.0	<1.0	<1.0
352	Soil BAN47-2/0.15-0.30	<1.0	<1.0	<1.0	<1.0	<1.0
352	Soil BAN47-3/0.30-0.45	<1.0	<1.0	<1.0	<1.0	<1.0
352	Soil BAN48-1/0.00-0.15	<1.0	<1.0	<1.0	<1.0	<1.0
352	Soil BAN48-2/0.15-0.30	<1.0	<1.0	<1.0	<1.0	<1.0
352	Soil BAN48-3/0.30-0.45	<1.0	<1.0	<1.0	<1.0	<1.0
352	Soil BAN49-1/0.00-0.15	<1.0	<1.0	<1.0	<1.0	<1.0
352	Soil BAN49-2/0.15-0.30	<1.0	<1.0	<1.0	<1.0	<1.0
352	Soil BAN49-3/0.30-0.45	<1.0	<1.0	<1.0	<1.0	<1.0
352	Soil BAN50-1/0.00-0.15	<1.0	<1.0	<1.0	<1.0	<1.0
352	Soil BAN50-2/0.15-0.30	<1.0	<1.0	<1.0	<1.0	<1.0
353	Soil BAN50-3/0.30-0.45	<1.0	<1.0	<1.0	<1.0	<1.0

CRL 99/932 Bangalow Dip

Lab.No.	Sample ID	DDE	DDD	DDT	Total DDT	Ethion
3531	Soil BAN51-1/0.00-0.15	1.1	<1.0	<1.0	1.1	<1.0
3532	Soil BAN51-2/0.15-0.30	<1.0	<1.0	<1.0	<1.0	<1.0
3533	Soil BAN51-3/0.30-0.45	<1.0	<1.0	<1.0	<1.0	<1.0
3534	Soil BAN52-1/0.00-0.15	<1.0	<1.0	<1.0	<1.0	<1.0
3535	Soil BAN52-2/0.15-0.30	<1.0	<1.0	<1.0	<1.0	<1.0
3536	Soil BAN52-3/0.30-0.45	<1.0	<1.0	<1.0	<1.0	<1.0
3537	Soil BAN53-1/0.00-0.15	<1.0	<1.0	<1.0	<1.0	<1.0
3538	Soil BAN53-2/0.15-0.30	<1.0	<1.0	<1.0	<1.0	<1.0
3539	Soil BAN53-3/0.30-0.45	<1.0	<1.0	<1.0	<1.0	<1.0
3540	Soil BAN54-1/0.00-0.15	<1.0	<1.0	<1.0	<1.0	<1.0
3541	Soil BAN54-2/0.15-0.30	<1.0	<1.0	<1.0	<1.0	<1.0
3542	Soil BAN54-3/0.30-0.45	<1.0	<1.0	<1.0	<1.0	<1.0
3543	Soil BAN55-1/0.00-0.15	<1.0	<1.0	<1.0	<1.0	<1.0
3544	Soil BAN55-2/0.15-0.30	<1.0	<1.0	<1.0	<1.0	<1.0
3545	Soil BAN55-3/0.30-0.45	<1.0	<1.0	<1.0	<1.0	<1.0
3546	Soil BAN56-1/0.00-0.15	<1.0	<1.0	<1.0	<1.0	<1.0
3547	Soil BAN56-2/0.15-0.30	<1.0	<1.0	<1.0	<1.0	<1.0
3548	Soil BAN56-3/0.30-0.45	<1.0	<1.0	<1.0	<1.0	<1.0
3549	Soil BAN57-1/0.00-0.15	<1.0	<1.0	<1.0	<1.0	<1.0
3550	Soil BAN57-2/0.15-0.30	<1.0	<1.0	<1.0	<1.0	<1.0
3551	Soil BAN57-3/0.30-0.45	<1.0	<1.0	<1.0	<1.0	<1.0

Method SOP2626
Results reported as mg/kg dry weight
Minimum level of reporting for DDT and Ethion in dip soil is 1.0 mg/kg

Robert Black
Chemist
21 January 2000