



Northern Rivers Contaminated Land Program - Contamination Report Summary Table

Property description and address	Page no.
e.g. Lot and DP, map of entire site as well as the investigation area(s)	7
Conceptual Site Model	
e.g. Contamination sources, receptors and exposure pathways between sources and receptors	13
Sampling and Analysis Quality Plan (SAQP)	
Justification for the sampling design (how will the data be representative and relevant)	17
Frequency and pattern of sampling	17
Justification for analytical plan (especially if the project uses composite samples)	18
Data quality objectives	14
Sampling Methodology	
Description of sample methodology	17
Description of media sampled and sample depth interval (e.g. borehole logs, or soil description)	13
Notable contaminant concentrations e.g. maximum specific concentrations and validation results	
Soil and groundwater concentrations and comparison against appropriate EIL, HIL, HSL and GILs etc.	16
Discussion on QA/QC	18
Statistical analysis	N/A
Nature of works carried out	
e.g. soil investigation, ground water investigation, excavation, on-site remediation, removal of soil, validation sampling, backfilled with imported soil with ENM classification	soil
Nature and extent of residual contamination	
Contamination identified in investigation, contamination unable to be remediated within the scope of the work, or areas not assessed	N/A
Waste removed	
During remediation (details of classification and disposal)	N/A
Remediation Summary	
What was removed or treated? Was it successful, is residual contamination remaining? Is there a need for an ongoing Environmental Management Plan?	N/A
Statement of suitability	
The land is considered suitable for residential	
Report details	
Report title: PRELIMINARY CONTAMINATED LAND ASSESSMENT ,Planning proposal for a Dwelling at 103 Yagers Lane, Skinners Shoot	
Produced by: Greg Alderson & Associates	ABN: 58 594 160 789
Provided to Lismore City Council on: May 2022	
I [Wendy Attrill of Greg Alderson and Associates state that I have undertaken this assessment in accordance with the guidelines made and approved by the NSW Environment Protection Authority.	
Name: Wendy Attrill	Signature:
Contact details: office@aldersonassociates.com.au	02 6629 1552



PRELIMINARY CONTAMINATED LAND ASSESSMENT

**Planning Proposal for a Dwelling
Entitlement**

103 Yagers Lane, Skinners Shoot

For:	M. Schreiber
Report no:	21421-CL.docx
Date:	May 2022



**Greg Alderson
Associates**



Contact Information

43 Main Street,
Clunes NSW 2480

Telephone: 02 6629 1552

office@aldersonassociates.com.au
www.aldersonassociates.com.au

Document Information

Project name Proposed Dual Occupancy
Dwelling

Reference 21421-CL.docx

Revision
Summary

CONTENTS

1. INTRODUCTION7

2. SCOPE OF WORK.....7

3. SITE IDENTIFICATION 8

4. HISTORY OF SITE 8

 4.1. Parish maps 8

 4.2. Aerial Photographs..... 10

5. SITE CONDITION AND SURROUNDING ENVIRONMENT 18

 5.1. Site Investigation 18

 5.2. General Site Condition..... 18

 5.3. Signs of Contamination 18

6. GEOLOGY AND SOIL 18

7. CONCEPTUAL SITE MODEL 18

 7.1. Potential Contamination Sources..... 18

 7.2. Potential Chemicals of Concern 19

 7.3. Potential Receptors 19

 7.4. Potential Exposure Pathways 19

8. DATA QUALITY OBJECTIVES 19

 8.1. Step 1: State the problem 19

 8.2. Step 2: Identify the decision/goal of the study 19

 8.3. Step 3: Identify the information inputs..... 20

 8.4. Step 4: Define the boundaries of the study 20

 8.5. Step 5: Develop the analytical approach 20

 8.6. Step 6: Specify performance or acceptance criteria..... 20

 8.7. Step 7: Develop the plan for obtaining data 22

9. SAMPLING METHODOLOGY 22

 9.1. Sampling and Analysis Quality Plan (SAQP)..... 22

 9.2. Data Control..... 23

10. RESULTS 23

 10.1. Interpretation of Results 24

11. CONCLUSION 24

12. REFERENCES 26

CHAIN OF CUSTODY 28

LABORATORY ANALYSIS RESULTS 29

Greg Alderson Associates

Table 1: Aerial Photograph Description.....	17
Table 2 - NEPM 1999 (2013) HIL Acceptable Limits for Residential A.	21
Table 3 - Background Ranges for Potential Contaminants.....	21
Table 4 - NEPM 1999 (2013) EIL Urban Residential	22

EXECUTIVE SUMMARY

Greg Alderson and Associates have been commissioned by M. Schreiber to undertake a preliminary contaminated land assessment at Lot 8 DP 8385 103 Yagers Lane, Skinners Shoot, as part of the Planning Proposal to obtain a dwelling entitlement for the site. As required under SEPP (Resilience and Hazards) 2021, this assessment was conducted to determine if the area around the proposed dual occupancy has been contaminated from past or present land uses. Soil testing was undertaken around the two existing dwellings, which has formed the investigation area for this assessment, to determine if it is suitable for the proposed use. Staff of this office inspected the site as part of the assessment of any potential contamination.

To determine if any contamination was present on the site, a preliminary soil contamination assessment (Tier 1) was undertaken in accordance with NEPM 1999 (2013), DUAP and EPA (1998) and NSW EPA (1995) at the proposed development location. As the objective was to determine whether the proposed development area is contaminated, it was considered that a systematic sampling pattern be undertaken to determine the presence of possible chemical contamination in this area, in accordance with NSW EPA (1995) and Council's Contaminated Land Policy.

Two composite soil samples were collected in the investigation area. Samples were analysed for heavy metals (including arsenic, lead, zinc and copper), organochlorines (including DDT and aldrin/dieldrin) and organophosphorus, which were considered to be the most likely chemicals used on an agricultural/horticultural property or associated with past buildings, cattle dips or chemical storage. The sampling results were compared to adjusted Health Investigation Limits (HIL) from NEPM 1999 (2013) and concentrations of all tested contaminants were below the relevant HILs.

Based on the known history of the site, inspection of the site and sampling regime, it is concluded that further soil contamination assessment is not required in the investigation area. NSW EPA (1995) & NEPM 1999 (2013) state that if the contaminant concentration of the site is below a threshold limit and there is no indication that further investigation is required, the site can be considered as uncontaminated. This is considered to be the case on this site.

1. INTRODUCTION

Greg Alderson and Associates have been commissioned by M. Schreiber to undertake a preliminary contaminated land assessment at Lot 8 DP 8385, 103 Yagers Lane, Skinners Shoot. This assessment is required to determine that the subject site is suitable for approval of a proposed dual occupancy dwelling development at the site, and it is understood in the initial instance, a dwelling entitlement is being sought through a Planning Proposal.

As required under State Environmental Planning Policy (Resilience and Hazards) 2021, this assessment was conducted to determine if the investigation area was contaminated from past or present land uses. The site was assessed for contamination in accordance with the requirements of the National Environmental Protection Measure 1999 (2013) (NEPM).

The proposed building and its curtilage were classed as the investigation area for this assessment and is shown in **Exhibit No. 2**.

2. SCOPE OF WORK

This investigation is Tier 1 - preliminary site investigation, which is required to determine if contamination of the site's soil has occurred from past land usage in accordance with NEPM 1999 (2013), DUAP and EPA (1998). The investigation includes obtaining a history of land usage on the site and a preliminary soil-sampling regime. The results of the soil sample analysis are compared with the Health Investigation Levels (HIL's) outlined in NEPM 1999 (2013) and have been adjusted for composite soil sampling. If the sample results are above the relevant HIL a detailed investigation will be required in accordance with NEPM 1999 (2013) & NSW EPA (2000) which would include the ecological investigation levels and Groundwater investigation levels.

The relevant guidelines used for the investigation are as follows:

- Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites (1992);
- NSW EPA (1995) Contaminated Sites - Sampling Design Guidelines;
- National Environmental Protection Measure 1999 (2013);
- Northern Rivers Regional Councils *Regional Policy for the Management of Contaminated Land* (2006);
- NSW EPA (2020) Consultants reporting on contaminated land - Contaminated land guidelines
- NSW DEC (2017). *Contaminated Sites - Guidelines for the NSW Site Auditor Scheme*. NSW EPA Sydney South

Soil sampling methodology used in this investigation included:

- Soil analysis tests were undertaken to determine the presence of heavy metals, organochlorines and organophosphorus;
- All soil sampling was undertaken by Wendy Attrill (BAppSc) and Sandra Norris (BAppSc) of this office, using composite soil sampling of the sites topsoil at intervals of a maximum 20m;
- All samples were collected using a hand auger, placed in a plastic bag and delivered to Richmond Water Laboratories (RWL) who undertook analysis for the investigation for heavy metals and subcontracted to Envirolab for analysis of OrganoChlorines(OCs) and OrganoPhosphorus (OPs);
- All results from RWL were sent to this office for the completion of this report;

- Results were compared with NEPM 1999 (2013) HIL's according to 'residential A' sensitivity;
- The site was assessed in accordance with the Tier 1 requirements of NEPM 1999 (2013);
- The report is written in accordance with the relevant chapters of NSW DEC (2017). *Contaminated Sites - Guidelines for the NSW Site Auditor Scheme*. NSW EPA Sydney South

3. SITE IDENTIFICATION

The site is identified as Lot 8 DP 8385 103 Yagers Lane, Skinners Shoot The centre of the investigation area is GDA944 MGA 56 E557859.4 N6828151.

The subject site in its locality is presented in Exhibit No. 1.

4. HISTORY OF SITE

The subject allotment (lot 8) and four adjoining allotments were formerly used as a piggery (lots 4, 5, 6 and 7 DP 8385). The original homestead weatherboard house has been in place, probably since the early 1920's and the rural worker's house was given approval pursuant to BA 33/68. The allotment was originally part of an existing holding. It is not known when the piggery was initially started, however, it appears to be before 1958, based on the aerial photographs presenting buildings being present at that stage.

Council records show the following applications since the 1970's for development at the piggery:

76/2151 – store shed;
78/2029 – shed;
79/2394 – piggery;
82/2236 – pig shed;
83/2402 – pig shed; and
83/2530 - weighbridge.

In 2006 there was an approval to convert the piggery to a nursery, under DA 10.2005.315. DA 10.2010.208 approved a change of use to convert the currently approved sales area for the nursery to a place of assembly.

4.1. Parish maps

An excerpt of the 1940 edition 'Byron' parish map of the subject area (NSW LPI Six Viewer) was studied (Figure 1), which presented the site as part of a much larger holding of 593 acres, under former Portion 63. The parish maps present that the site was a large holding, however, by 1960 it appears that the intention was to have smaller parcels of land.

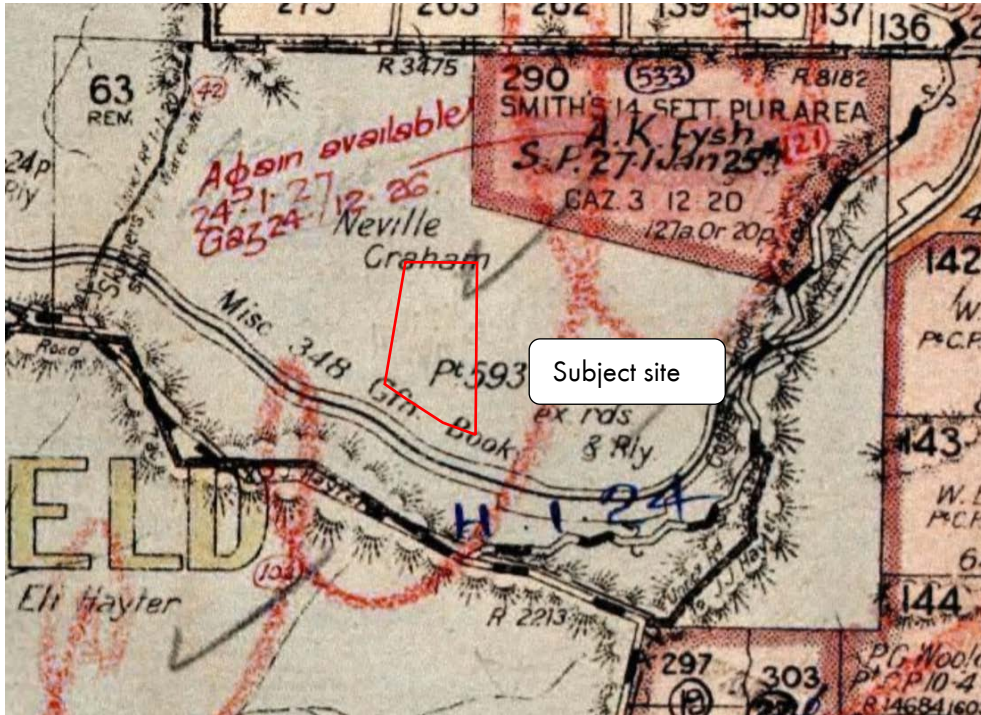


Figure 1 – 1940 Byron Parish map (Sourced: NSW LPI Six Viewer, 2021)

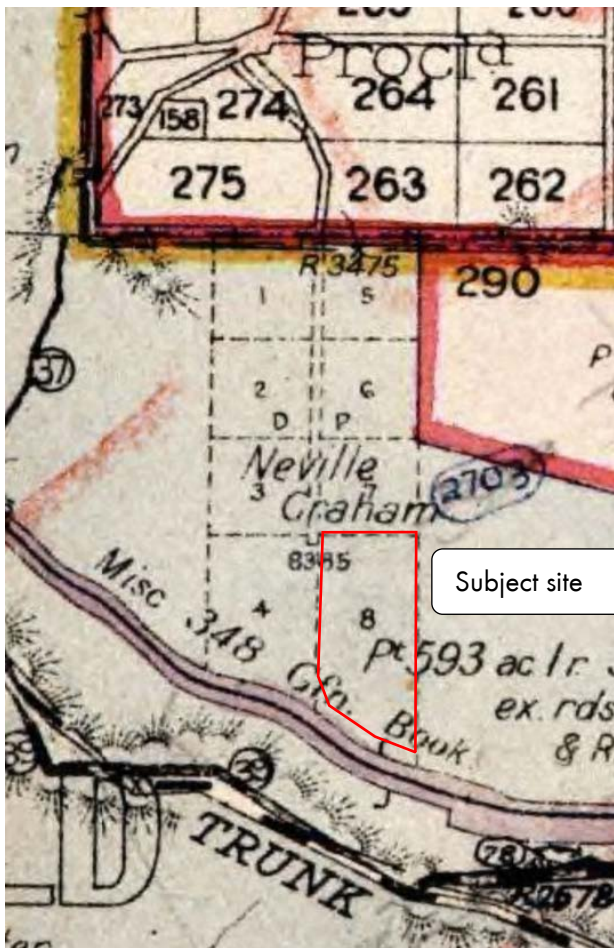


Figure 2 – 1960 Byron Parish map (Sourced: NSW LPI Six Viewer, 2021)

4.2. Aerial Photographs

Historical images were sourced from the NSW Historical Imagery Viewer found within the Spatial Collaboration Portal. Aerial images sourced for the years 1958 (Figure 3), 1966 (Figure 4), 1971 (Figure 5), 1979 (Figure 6), 1987 (Figure 7), 1991 (Figure 9), 1997 (Figure 9). Satellite imagery was sourced from Google Earth 2009 (Figure 10), 2014 (Figure 11), 2016 (Figure 12) and 2021 (Figure 13). These images were viewed for evidence of land uses and potentially contaminating activities. A summary of the findings are presented below.

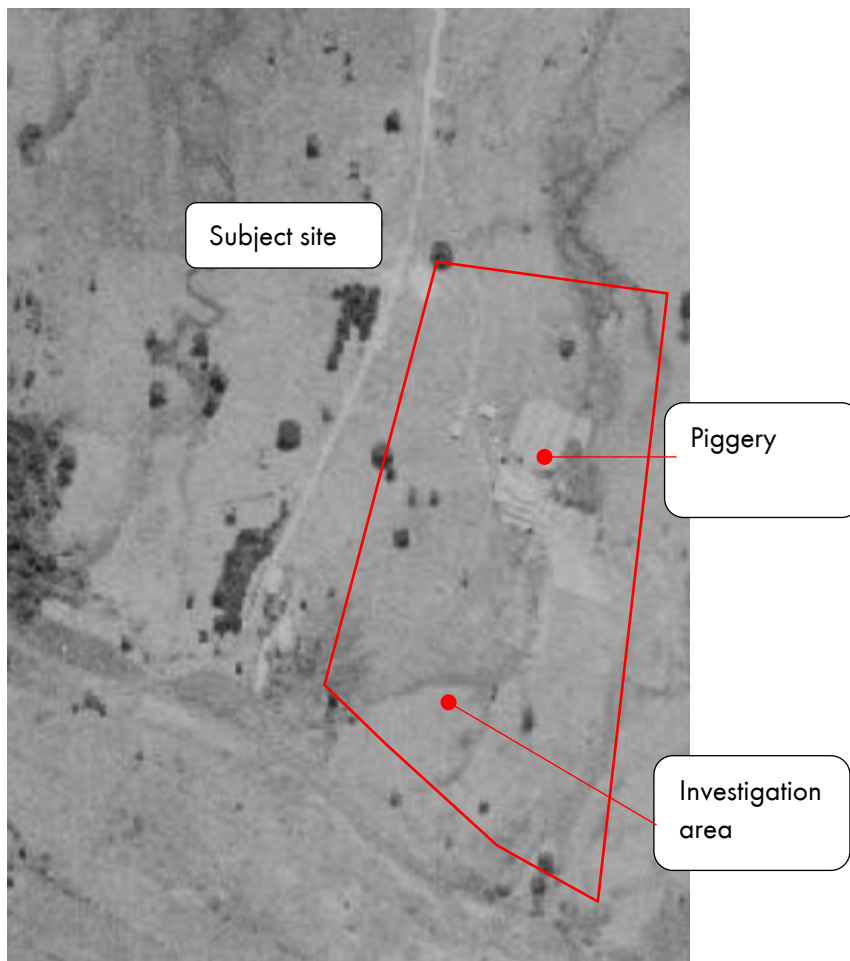


Figure 3. 1958 Historical aerial image (Source: NSW Spatial Collaboration Portal, 2021). Approximate boundaries



Figure 4. 1966 Historical aerial image (Source: NSW Spatial Collaboration Portal, 2021). Approximate boundaries

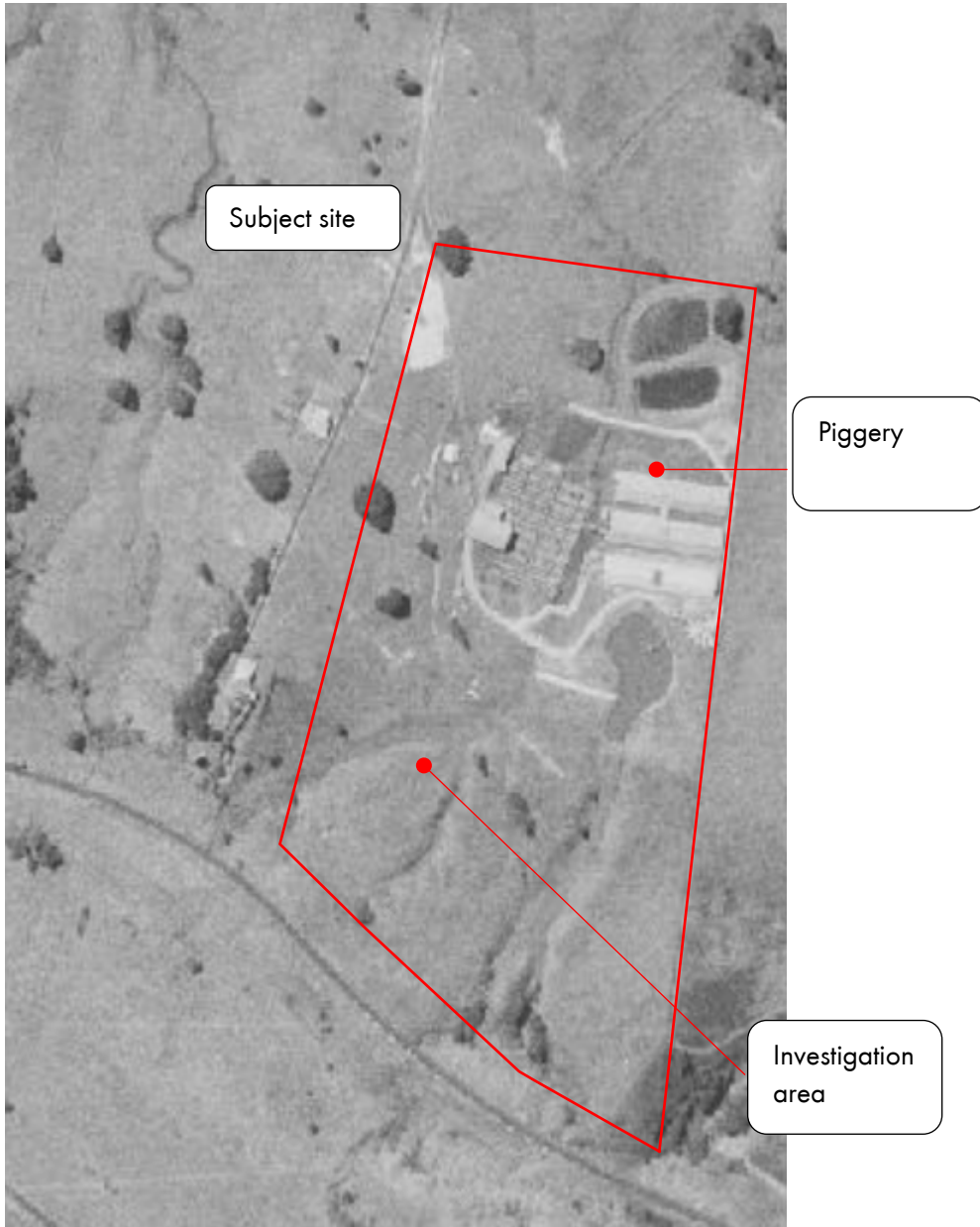


Figure 5. 1971 Historical aerial image (Source: NSW Spatial Collaboration Portal, 2021). Approximate boundaries

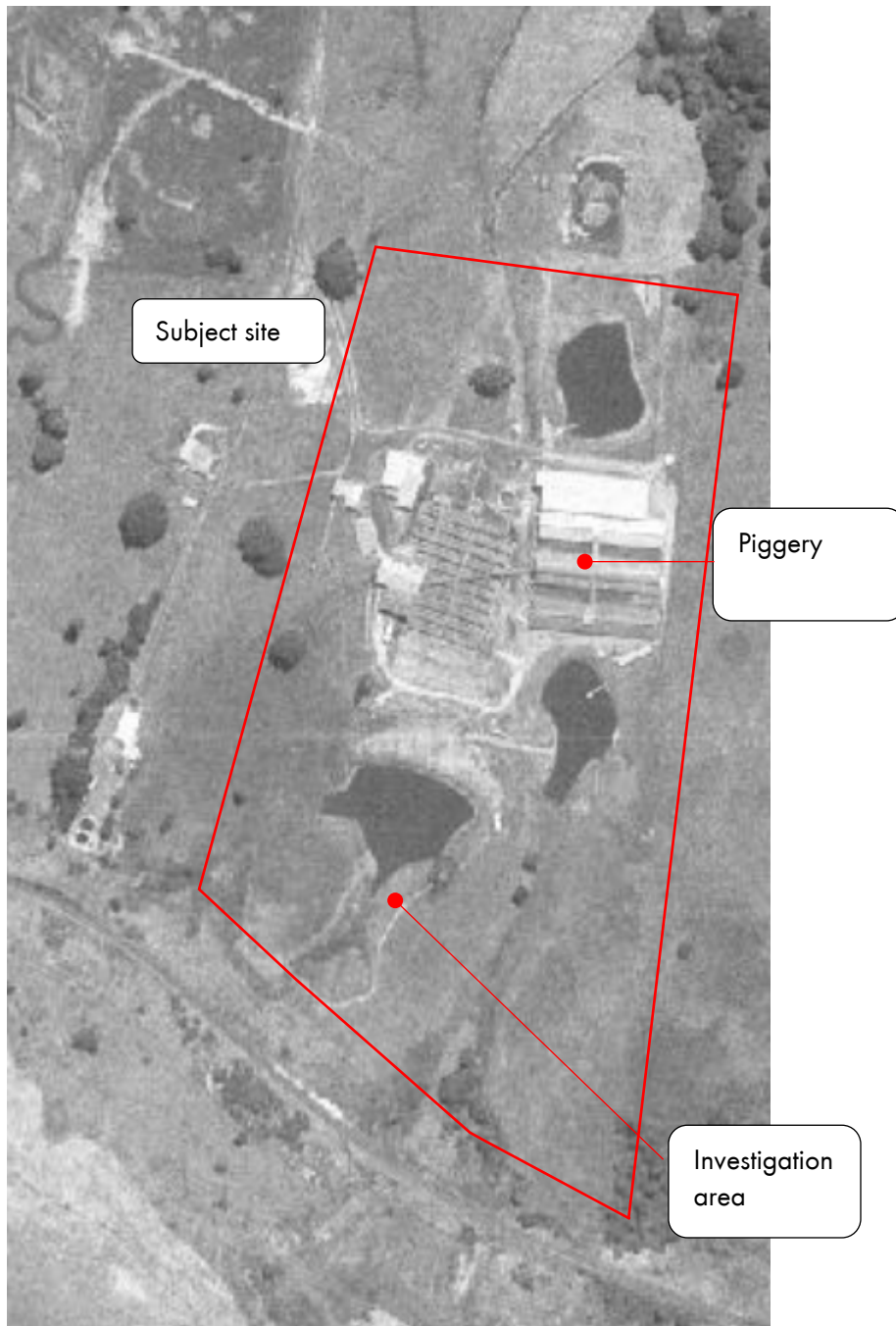


Figure 6. 1979 Historical aerial image (Source: NSW Spatial Collaboration Portal, 2021). Approximate boundaries

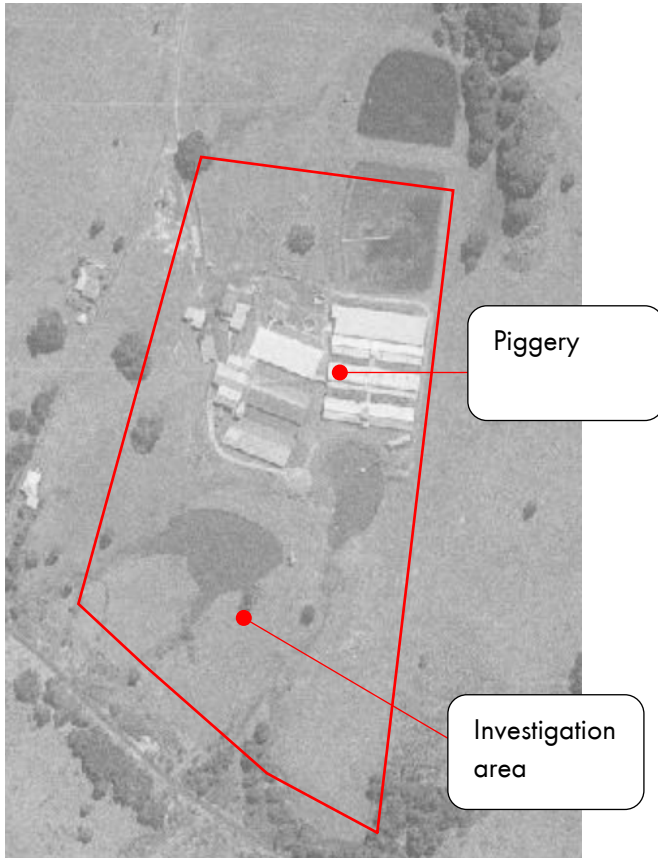


Figure 7. 1987 Historical aerial image (Source: NSW Spatial Collaboration Portal, 2021). Approximate boundaries

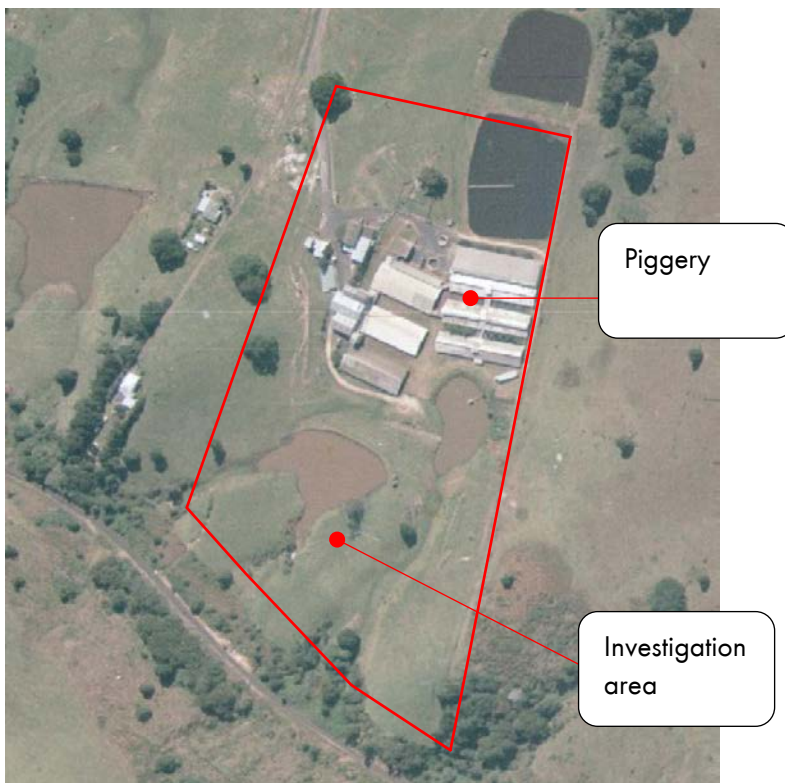


Figure 8. 1991 Historical aerial image (Source: NSW Spatial Collaboration Portal, 2021). Approximate boundaries

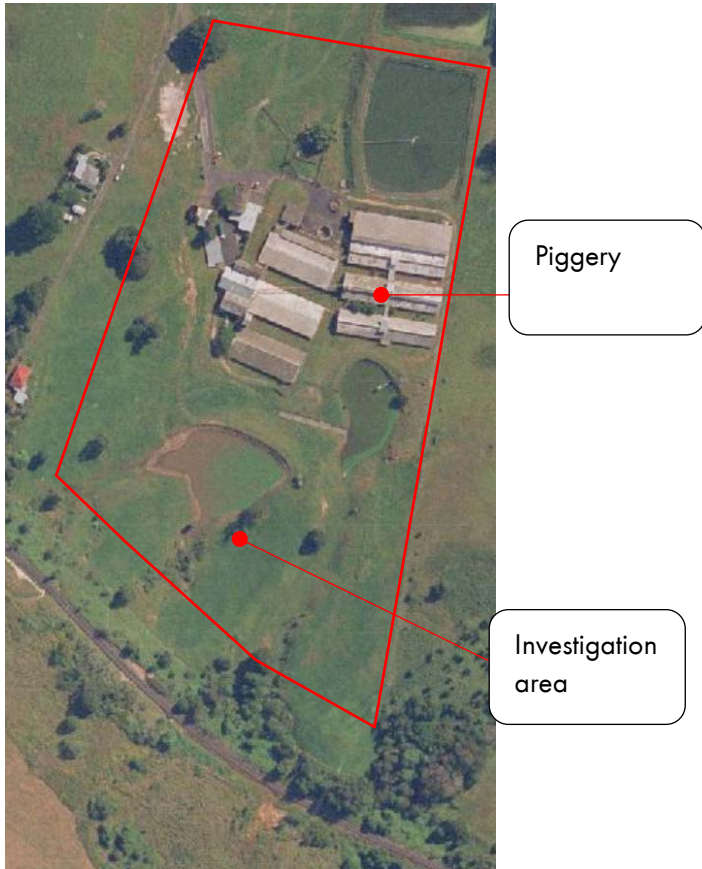


Figure 9. 1997 Historical aerial image (Source: NSW Spatial Collaboration Portal, 2021). Approximate boundaries

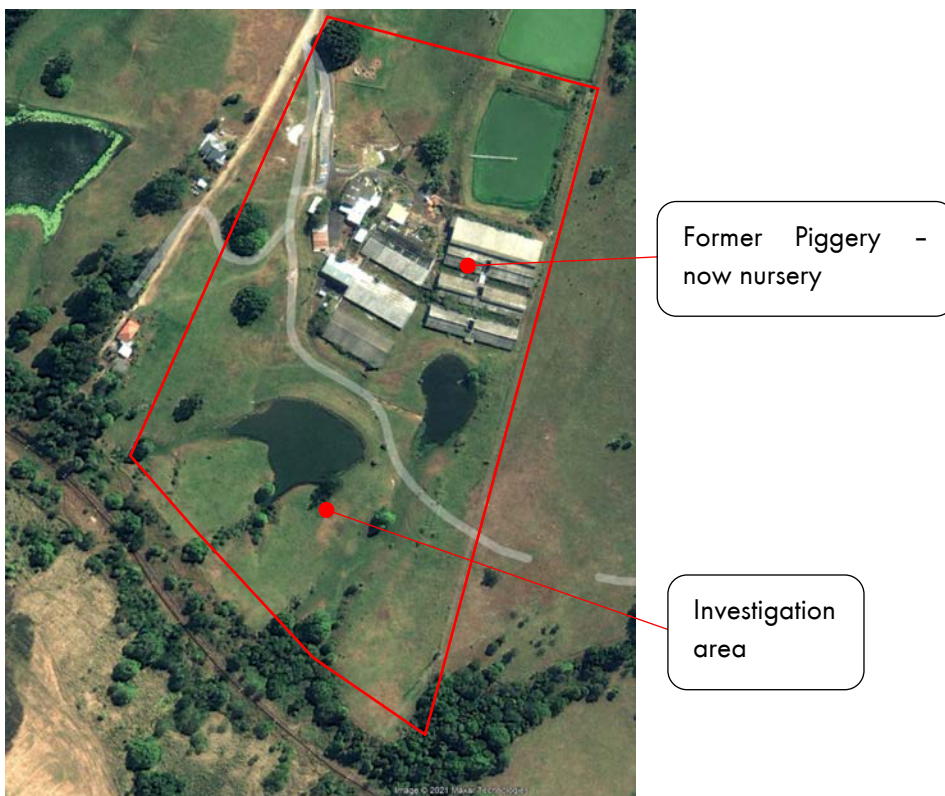


Figure 10. 2009 Google Earth

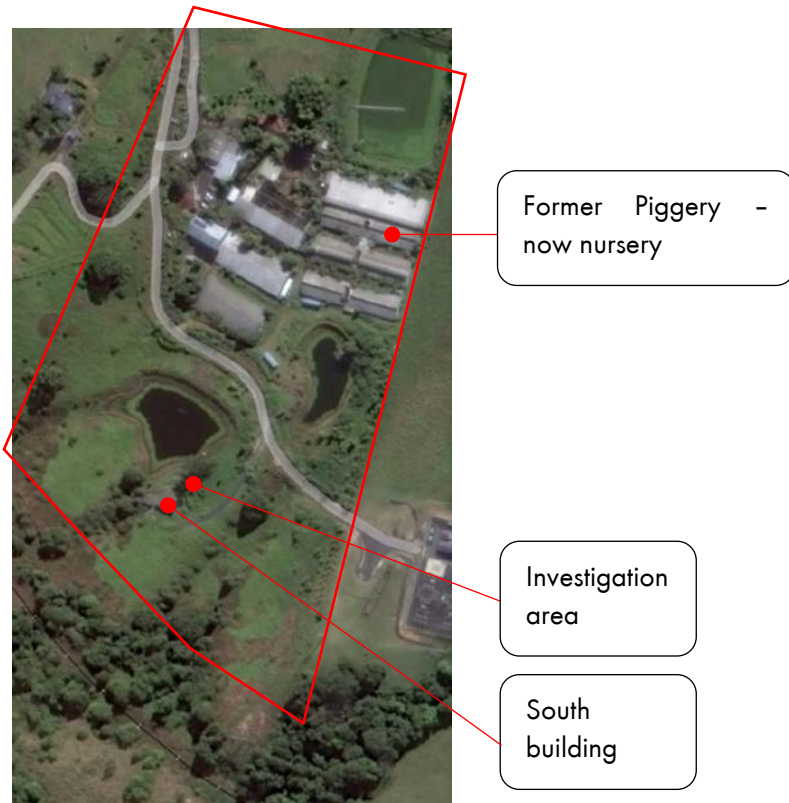


Figure 11. 2014 Google Earth

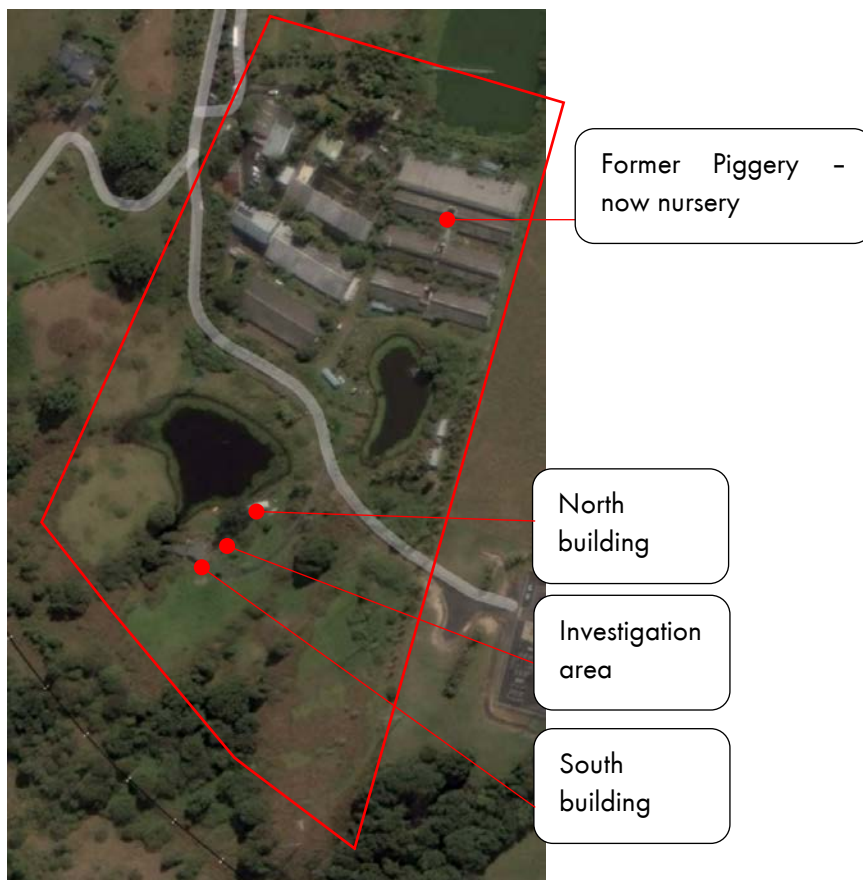


Figure 12. 2016 Google Earth

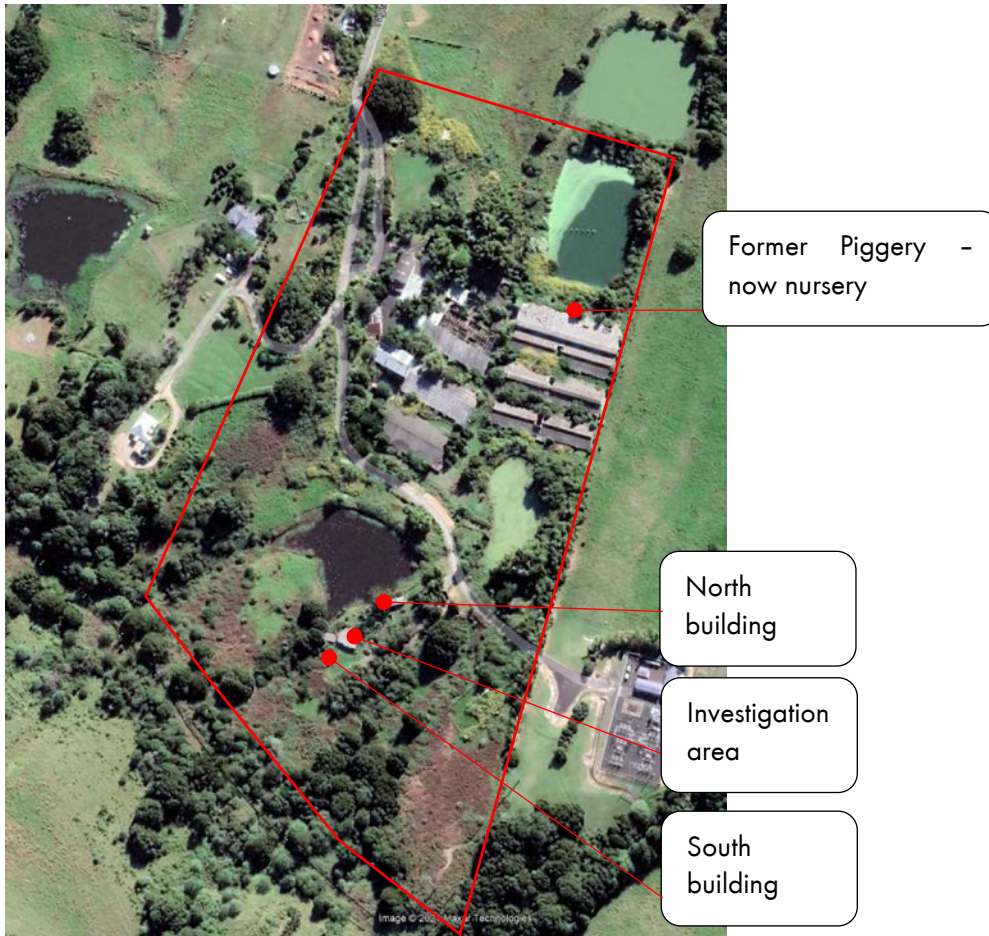


Figure 13. 2021 Google Earth

Table 1: Aerial Photograph Description

Year	Description
1958	Site is relatively clear apart from buildings in the northern portion of the allotment, most likely for the piggery. No buildings in the investigation area. Buildings observed to the west, being the dwelling.
1966	Similar to 1958, additional buildings at piggery. No buildings in the investigation area
1971	Additional buildings at piggery, large sheds towards the eastern boundary. Large effluent ponds to the north of buildings and water catchment to the south of buildings. No buildings in the investigation area. Another building, presumably a dwelling on property to the west.
1979	Additional buildings at piggery. Changes to effluent ponds to the north of buildings and additional water catchment to the south of buildings adjacent to investigation area. No buildings in the investigation area
1987	Similar to 1979. No buildings in the investigation area
1991	Similar to 1987. No buildings in the investigation area.
1997	Similar to 1991. No buildings in the investigation area.
2009	Similar to 1991. No buildings in the investigation area.
2014	Building to the south in the investigation area. Regrowth vegetation occurring.
2016	Building to the south and north in the investigation area. Regrowth vegetation occurring.
2021	Building to the south and north in the investigation area. Regrowth vegetation more dense.

5. SITE CONDITION AND SURROUNDING ENVIRONMENT

5.1. Site Investigation

Staff of this office investigated the subject site, which is accessed from the end of Yagers Lane. The investigation occurred on the 9th September, 2021. The investigation area consisted of the area around the two existing structures, which are located towards the south of the allotment, and forms the investigation area. Other areas were not assessed, as there is no proposed change of use for other areas of the site currently. A general inspection of the surrounding area and land uses was also made.

5.2. General Site Condition

The investigation area contains two buildings, which have been relocated to the site. The area is well landscaped, consisting of gardens and maintained lawns. The site overlooks a large dam, which was once used as water supply to the piggery. The site is located upslope and spatially separated from the former piggery buildings.

5.3. Signs of Contamination

The site was investigated in order to determine any physical signs of contamination, such as drums, waste, fill material, odours, plant stress or soil staining or bare patches. There was no visual evidence of any contaminating activities having had or currently occurring in the investigation area, the investigation area looks like two dwellings with landscaped gardens.

6. GEOLOGY AND SOIL.

The soils of the site consist of sandy top soils. Morand (1994) shows that the soil type of the investigation area is in the 'Bagotville Soil Landscape'. The soil consists of sand overlying clay loams with a change to clay subsoils.

If chemicals were used on the site, due to the soil texture and structure, the contaminants would be remaining in the upper layers, typically 0-150 mm for arsenic and 0-75 mm for dieldrin.

As stated in Schedule B1 of NEPM 1999 (2013), HIL's are generic to all soil types and so will not require a textural classification for determining investigation Levels.

7. CONCEPTUAL SITE MODEL

From the known land use of the site, obtained from the desk top assessment, a preliminary conceptual site model (CSM) was developed to identify the potential contamination sources, the exposure pathways of these sources and the likely receptors of contamination associated with the land uses activities in the investigation area. The following provides a summary of the CSM.

7.1. Potential Contamination Sources

The aerial photographs present that the investigation area was not part of the former piggery area, which was situated in the buildings to the north of the investigation area. The investigation area appears to have been cleared of vegetation and there were no previous land uses in the area. The most likely contamination

source at the site is from agricultural use, specifically chemicals used on property for any previous agricultural use if this may have occurred in the investigation area.

7.2. Potential Chemicals of Concern

The aerial photographs did not indicate that there were previous use in the investigation area, such as plantations, buildings, dip sites etc.

As previous land uses were not identified in the investigation area, it is not expected that the general suite of chemicals that are often used on agricultural properties such as heavy metals (lead, arsenic and copper) and pesticide or herbicide (OCs/Ops) would be found.

7.3. Potential Receptors

The most likely potential receptors to the areas are:

- Current workers at the site – maintaining through mowing and general use of the area
- Construction workers during site redevelopment – lower risk
- Future occupants – greatest risk

7.4. Potential Exposure Pathways

The potential exposure pathways to the potential contamination are from contact with the soil, through either ingestion of dirt, dust and dermal contact.

The recommended management action is as follows:

- If contaminants are found in soil – reduce risk through remediation of the site to deem it suitable for future occupants

As stated in Schedule B1 of NEPM 1999 (2013), HIL's are generic to all soil types and so will not require a textural classification for determining investigation Levels.

8. DATA QUALITY OBJECTIVES

In accordance with the requirements of NEPM 1999 (2013) the Data Quality Objectives is a seven step iterative planning approach that is used to define the type, quantity and quality of data needed to inform decisions relating to the environmental condition of a site.

8.1. Step 1: State the problem

The objective of the investigation is to ensure that the site will be suitable for the proposed use for a private dwelling, and therefore is for residential use.

8.2. Step 2: Identify the decision/goal of the study

A conceptual site model was prepared which has determined the potential contamination at the site and identified risk pathways, which is attached as a diagrammatic interpretation.

The goal of the assessment is to determine:

- Is there residue contamination from agricultural activities at the site within the soil that may prevent the residential use or
- If contamination is present that will require remediation or
- If the site is suitable without further investigation

Based on the contaminants of concern, the most likely receptor will be the occupants of the dwelling. There is a low risk of groundwater, surface water contamination and low risk of contamination in service trenches.

8.3. Step 3: Identify the information inputs

It is determined that soil sampling is required as a preliminary assessment to determine if contamination is present. Sampling of groundwater is considered not to be required.

It is proposed that sampling be undertaken in the investigation area, using Table A of NSW EPA (1995) as an initial assessment.

8.4. Step 4: Define the boundaries of the study

The investigation area involves only the change of use area of the subject allotment, to be considered only for the dual occupancy, and is defined as the investigation area. This involves sampling of the readily accessible soil, which presents the greatest risk to the future occupants of the site, being in direct contact

8.5. Step 5: Develop the analytical approach

Although the development is on a larger parcel of land, only the investigation area was assessed and in accordance with the Regional Contaminated Land Policy a minimum area of 2500 m² was assessed, which requires 8 point samples to be taken in accordance with NSW EPA (1995). A total of 8 samples were collected from the site. The samples were collected in systematic pattern and samples were not collected more than 20 m apart.

Due to the sites soil type and geology, it was considered that only the topsoils of the soil profile require sampling due to arsenic and aldrin/dieldrin being commonly found within the first 150mm of soil (NSW EPA, 1997).

The samples were then taken to the laboratory who derived composite samples from 4 samples within each set. The composite samples were then analysed.

In the event of there being high levels of contaminants found in a composite sample, further soil testing will be carried out to pin point contaminant locations and levels by analysing the sub samples forming the composite sample.

8.6. Step 6: Specify performance or acceptance criteria

Due to the site history and the agricultural land use, soil sampling was undertaken for heavy metals and chemicals that were commonly used in fertilisers, pesticides, herbicides, dip formulas and with old building materials. These include pesticides and herbicides that were commonly used in agriculture, such as organochlorines (OCs) and organophosphates (OPs), and heavy metals such as lead, arsenic and copper. The suite of contaminants were also commonly associated with building materials in the case that they have contaminated the investigation area, that may have been present in the years before or between aerial photographs.

It was considered that if any of these contaminants were found, further analysis may be triggered for these contaminants and other suites.

Due to the use of a composite sampling technique, the acceptable limit outlined in Table 1A(1) of NEPM 1999 (2013) had to be adjusted by dividing the acceptable limit by the number of subsoil samples per composite (Table 2), which in this case is four. The adjustable acceptable limit, which is a very conservative approach, was used to determine the presence of hotspots, based on the worst-case scenario of presuming one sample has a high concentration while the remaining sub-samples all have zero concentration. If results from the composites taken from the site were above the adjusted acceptable limit, then all subsoils of the failed composite will be analysed individually.

Table 2 - NEPM 1999 (2013) HIL Acceptable Limits for Residential A.

Contaminant	NEPM HIL Acceptable Limit (mg/kg)	Adjusted NEPM HIL Acceptable Limit for 4 subsamples (mg/kg)
Arsenic	100	25
Lead	300	75
Cadmium	20	5
Copper	6000	1500
Zinc	7400	1850
DDT-DDE-DDD	240	60
Aldrin/Dieldrin	6	1.5

Metals can be naturally occurring within a soil profile; these background levels are shown below (Table3).

Table 3 - Background Ranges for Potential Contaminants

Pollutant	Background Range (mg/kg)
Arsenic	<15
Lead	<25
Cadmium	<1
Copper	10-30
Zinc	50-200

NSW EPA (1995) & NEPM 1999 (2013) state that if the contaminant concentration of the site is below a threshold limit, the site can be considered as uncontaminated.

The results of the soil sample analysis are compared with the Health Investigation Levels (HILs) set out in Table 1A(1) of NEPM 1999 (2013) under Residential A.

The Ecological Investigation Levels (EILs) are compared with the National Environment Protection (Assessment of Site Contamination) Measure when assessing a contaminated site. NEPM 1999 (2013)

states that the EILs are numerical limits that are designed to protect soil and terrestrial flora and fauna (including pets and wildlife) and soil microbial processes from experiencing substantial deleterious effects caused by contaminants. Ecological Investigation Levels are the ecological equivalents of the investigation levels that aim to protect human health (HILs) and groundwater (GILs). Measured concentrations of contaminants in the soil at a site are compared to the appropriate EILs and if they exceed the EILs then further investigation in the form of an ecological risk assessment that conforms to Schedule B5a (NEPC, 2011) should be conducted.

The EILs in Table 3 are based on the limit for 'aged' contaminant given that the contaminants of interest would have been present for two years or more. The default values for each contaminant were used in the NEPC 2011 EIL calculation spreadsheet, the figures are conservative allowing for total concentration for all contaminants.

Table 4 - NEPM 1999 (2013) EIL Urban Residential

Contaminant	NEPM EIL Aged (mg/kg)
Arsenic	100
Lead	1100
Cadmium	20
Copper	230
Zinc	770
DDT	180

8.7. Step 7: Develop the plan for obtaining data

The plan for obtaining data was developed through knowledge of past history, gaps in past history, knowledge of nearby contaminating sources and development of a surface soil sampling plan which meets the minimum requirements of NSW EPA (1995) using a systematic sampling pattern.

9. SAMPLING METHODOLOGY

9.1. Sampling and Analysis Quality Plan (SAQP)

The sample location was chosen for the 'change of use area' being the proposed dwelling and its curtilage, and therefore this area was chosen by 'judgemental' sampling. Furthermore, the regional contaminated land policy requires that an area of 2500 m² be assessed, which requires 8 point samples to be taken in accordance with NSW EPA (1995). Eight samples were collected in the investigation area. These samples were collected over the area with a separation of up to 20m using a partially judgemental sampling pattern (Table A, NSW EPA 1995). Composite samples collection was in accordance with NSW EPA (1995) being no samples greater than 20 m apart and laboratory to mix samples to obtain a thoroughly mixed sample for analysis.

Due to the sites soil type and geology, it was considered that only the topsoils of the soil profile require sampling due to arsenic and aldrin/dieldrin being commonly found within the first 150mm of soil (NSW EPA, 1997). The location of the samples is given in **Exhibit No.2**.

In the event of there being high levels of contaminants found in a composite sample, further soil testing will be carried out to pin point contaminant locations and levels by analysing the sub samples forming the composite sample.

Sampling was undertaken in the top soil at the site in order to provide a more conservative assessment (due to if contaminants are present, they would be in the upper soil profile, bound to clay and organic particles).

A total of 2 composite soil samples were collected and analysed over the proposed development site, as described below.

Composite 1 – Consisting of samples 1A, 1B, 1C and 1D. These samples were located around the northern dwelling and within the landscaping area to the south, up to 20 m apart.

Composite 2 – Consisting of sample points 2A, 2B, 2C and 2D. These samples were located around the southern dwelling and the landscaping area to the north of the dwelling, up to 20 m apart.

Exhibit No.2 presents the soil sample locations.

The use of composite sampling is considered appropriate for this site given the following:

- Known history indicated contamination was unlikely no indication of former structures or plantations in the investigation area;
- Laboratory mixes and forms the composite samples (not done in field); and
- Although NEP 1999 (2013) section 6.2.6 states that composite samples is not suitable for the assessment of semi volatile substances such as OC/OP pesticides, however it is considered that the use of composite samples is a cost effective measure to determine if OC/OP are on the site, and if so, individual samples that the laboratory retains would then be analysed for OC/OPs

9.2. Data Control

Due to the small sampling size and the proposed development, no duplicates were collected as part of the assessment. However, a direct chain of custody was kept (see attached) and Laboratory quality assurance/quality checking was obtained.

Samples collected by this office were collected using a hand auger, placed in plastic bags and sealed prior to placing in an esky. All samples were transported by staff of this office to the Richmond Water Laboratories (RWL) the same day of collection. The RWL made the composite samples from the sub-samples provided and subcontracted organochlorines and organophosphorus analysis to Envirolab. The RWL analysed the soil samples for heavy metals. Laboratory QA/QC are attached to this report, with the chain of custody from this office.

10. RESULTS

A site plan is provided in **Exhibit No. 2**, presenting soil test locations. Table 5 presents a summary of the soil analysis results from the composite soil samples collected by this office. The full copies of the analysis results are also attached to this report in Appendix B.

Table 5 - Summary of composite soil sample analysis results.

Parameter	Composite 1 (mg/kg)	Composite 2 (mg/kg)
OC/OP in soil	<0.1	<0.1
Arsenic	<5	<5
Cadmium	<1	<1
Copper	7	12
Lead	4	5
Zinc	18	36

*ND - not detected

10.1. Interpretation of Results

The results of the soil analysis are compared with the HILs set out in Table 1A(1) of NEPM 1999 (2013) under Residential A, using 'adjusted acceptable levels'. OP's or OC's were not detected in recordable concentrations within the soil samples, while all heavy metals were found lower than the adjusted HIL's.

Cadmium was not detected in the testable range in both composite samples. Lead, zinc, arsenic and copper were also in low concentrations and within the background ranges. No sample was above the EIL.

The results of the sampling regime and the known history of the site indicate that further investigation is not warranted in the investigation area. The contaminants found at the site are in low levels and are well below the current adjusted health-based and ecological investigation levels. Further assessment of the individual samples was not warranted, nor was the use of statistical analysis to determine the 95%UCL required for the site, and no further investigation is warranted.

11. CONCLUSION

A preliminary contaminated soil investigation was undertaken in the proposed development area of Lot 8 DP 8385 103 Yagers Lane, Skinners Shoot The purpose of this assessment was to determine if the location of the proposed dual occupancy dwelling is suitable for residential use and therefore allow for the site to obtain a dwelling entitlement, and is not contaminated from past land use. As part of the assessment under SEPP (Resilience and Hazards) 2021, to ensure that the investigation area has not been contaminated, soil testing was undertaken around the proposed dwelling envelope and its curtilage.

Samples were analysed for heavy metals (including arsenic and lead), organochlorines and organophosphorus, which were considered to be the potential chemicals to cause contamination at the site due to past agricultural use, albeit no uses were observed in the aerial photographs. The sampling results were compared with the HILs and EILs set out in Table 1A(1) of NEPM (1999) under Residential A, using 'adjusted acceptable levels'. All soil contaminant concentration results were below the relevant HILs.

Based on the known history of the site, inspection of the site and sampling regime, it is concluded that further soil contamination assessment is not required in the proposed development area. NSW EPA (1995) and NEPM 1999 (2013) state that if the contaminant concentration of the site is below a threshold limit, the investigation area can be considered as uncontaminated, and this is considered to be the case on this site. The site is suitable for the proposed development.

Greg Alderson Associates

This assessment has been undertaken in accordance with NEPM 1999 (2013). If rubbish or other indicators of contamination are found on the site that has not been addressed under this assessment, further assessment may be warranted.

12. REFERENCES

Australian and New Zealand Environment and Conservation Council and National Health and Medical Research Council (1992). *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites*.

Department of Urban Affairs and Planning and the Environment Protection Authority(1998). *Managing Land Contamination, Planning Guidelines SEPP 55 - Remediation of Land*.

Morand, D.T. (1994). *Soil Landscapes of the Lismore-Ballina 1:100,000 Sheet* Report, Soil Conservation Service of NSW, Sydney.

National Environment Protection (Assessment of Site Contamination) Measure 1999 (revised 2013).

NSW EPA (2020). *Consultants reporting on contaminated land. Contaminated land guidelines*. NSW EPA Sydney South

NSW DEC (2017). *Contaminated Sites - Guidelines for the NSW Site Auditor Scheme*. NSW EPA Sydney South

NSW EPA (1995). *Contaminated Sites - Sampling Design Guidelines*. NSW EPA Chatswood.

Summary of Experience and Qualifications.

Greg Alderson & Associates have been reporting on contaminated land since 1998 and are experienced in Tiers 1-4 assessments as described in NEPM 1999 (2013).

Greg Alderson and Associates have the following qualifications relevant to reporting on contaminated land:

- Bachelor of Applied Science - Conservation Technology
- Bachelor of Environmental Science - Natural Resource Management
- Bachelor of Engineering - Civil
- Bachelor of Engineering - Environmental.

Further qualifications & training our staff have include:

- Contaminated land training courses hosted by Environmental Health Australia,
- Competencies in RTC2701A Follow OHS procedures, RTC3705A Transport, handle and store chemicals,
- White card.

Greg Alderson and Associates have a wide range of experience and worked on a number of varied projects, which include:

- Petrochemical rehabilitation;
- Analysis and Rehabilitation of dipsites;
- Assessment & remediation of former banana plantations;
- Review of remediation plan for gas works site;
- Assessment & remediation of contamination caused from lead-based paints in residential settings;
- Assessment of general agricultural sites.

Greg Alderson and Associates has the following Public Liability Insurance:

Agent: CGU Insurance Ltd
Policy Number: 15T2402648
Expiry Date: 23/2/2023

Greg Alderson and Associates has the following Professional Indemnity Insurance:

Agent: Solution Underwriting Agency Pty Ltd
Policy Number: 9009711PIN
Expiry Date: 4/03/2023

CHAIN OF CUSTODY

CHAIN OF CUSTODY FORM

Sheet 1 of 1

INVESTIGATOR:
GREG ALDERSON AND ASSOCIATES
 ABN 58 594 160 789
 43 Main Street, Clunes NSW 2480
 Ph: 02 6629 1552
 E-mail:
 office@aldersonassociates.com.au
Contact:
 Wendy Attrill

Container
Sample Matrix
Sample Preservation

SITE:
 21421

COURIER:
 Greg Alderson & Associates

LABORATORIES: RICHMOND WATER LABORATORY

Contact:

Laboratory Analysis Required

Sample ID	Date of Collection	Plastic Bag	Plastic Bottle	Glass Bottle	Soil	Soil Composite	Water	Other	Esky	Esky & Ice	Other
1a									/		
1a	9/9/21	/	/		/				/		
1b		/	/		/				/		
1c		/	/		/				/		
1d		/	/		/				/		
2a		/	/		/				/		
2b		/	/		/				/		
2c		/	/		/				/		
2d		/	/		/				/		

} mix to form COMPOSITE 1
 heavy metals, OCS, OPS

} mix to form COMPOSITE 2
 heavy metals, OCS, OPS

Investigator: I attest that the proper field sampling procedures were used during the collection of these sample/s.

Signed: *Wendy Attrill*

Sampler Name (print): Wendy Attrill

Date: 9/9/21

Hazardous: Y N

Comment:

Relinquished by: *Wendy Attrill*

Date: 10/9/21
 Time: 10.40am

Received by: *Wendy Attrill*

Date: 10/9
 Time: 10.40

Relinquished by:

Date:
 Time:

Received by:

Date:
 Time:

LABORATORY ANALYSIS RESULTS



Certificate Of Analysis

Client: Greg Alderson & Associates
Address: 43 Main St
Clunes NSW 2480
Contact: Stuart Edwards
Sampled by: Wendy Attrill
Subcontract Laboratory: Envirolab (NATA2901)
Subcontract Reference: 278169

Final report

Report no: 21/1294
Date received: 9/09/2021
Testing commenced: 9/09/2021
Date reported: 23/09/2021
No. of samples: 2
Revision no: 00

Analysis results apply to samples as received.

GAA Soil - 21421

Sample No.: Sample description:	Unit	LOR	21/1294-1 21421 - Composite 1 9/09/2021	21/1294-2 21421 - Composite 2 9/09/2021
Date sampled:				
Time sampled:				
OC/OP in soil*	mg/kg	0.1	<0.1	<0.1
OC/OP QC Recovery	%	1	90	92
Arsenic - soil	mg/kg	5	<5	<5
Cadmium - soil	mg/kg	1	<1	<1
Copper - soil	mg/kg	1	7	12
Lead - soil	mg/kg	1	4	5
Zinc - soil	mg/kg	1	18	36
Arsenic - QC Recovery	%	1	104	[NA]
QC As - AB Duplicate RPD%	%		4	[NA]
QC As - AB Spike Recovery%	%		70	[NA]
Cadmium - QC Recovery	%	1	100	[NA]
QC Cd - AB Duplicate RPD%	%		0	[NA]
QC Cd - AB Spike Recovery%	%		92	[NA]



Certificate Of Analysis

Client: Greg Alderson & Associates


Report no: 21/1294

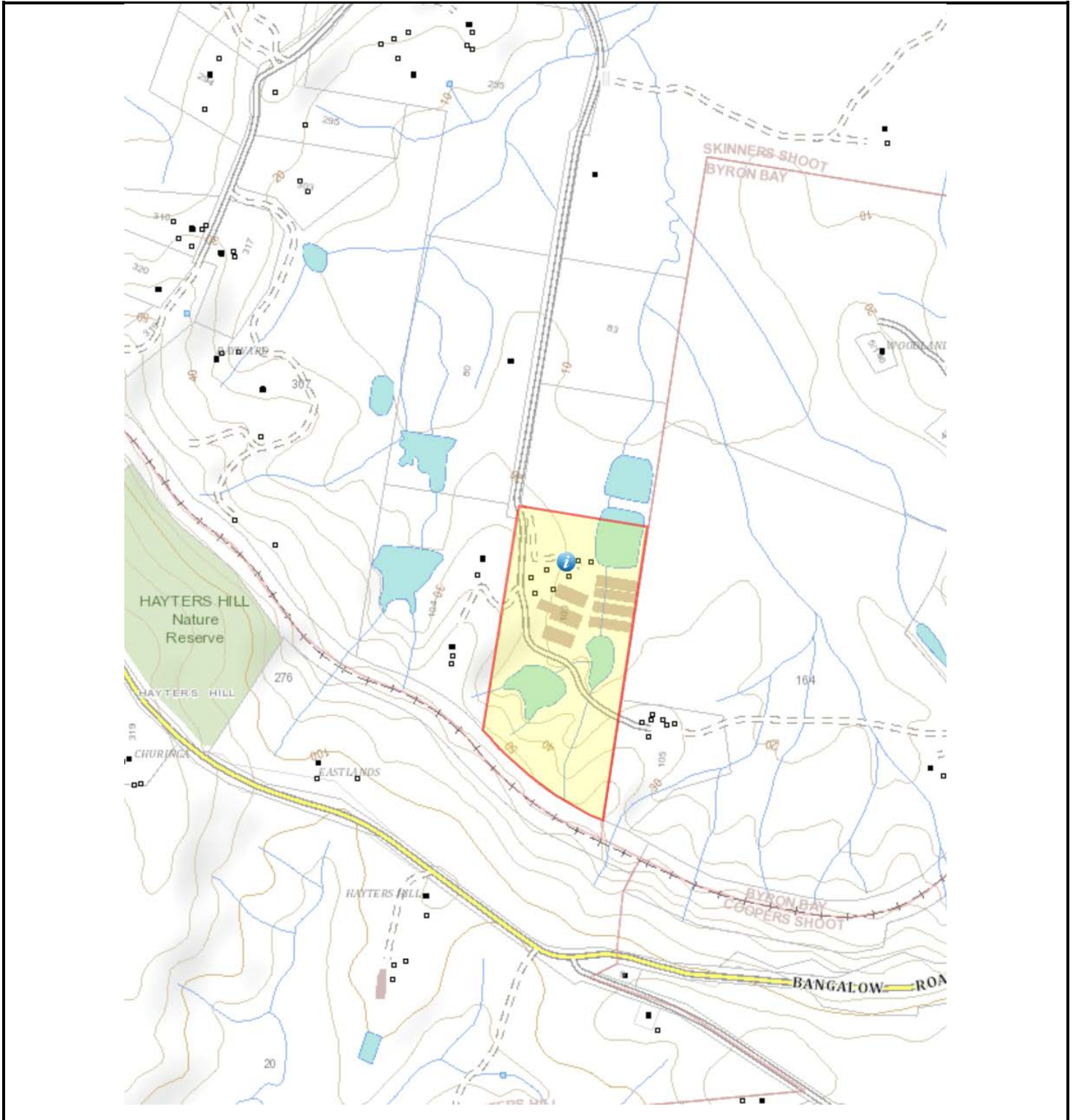
Sample No.: Sample description:	Unit	LOR	21/1294-1 21421 - Composite 1 9/09/2021	21/1294-2 21421 - Composite 2 9/09/2021
Copper - QC recovery	%	1	108	[NA]
QC Cu - AB Duplicate RPD%	%		1	[NA]
QC Cu - AB Spike Recovery%	%		114	[NA]
Lead - QC recovery	%	1	91	[NA]
QC Pb - AB Duplicate RPD%	%		5	[NA]
QC Pb - AB Spike Recovery%	%		77	[NA]
Zinc -QC recovery	%	1	84	[NA]
QC Zn - AB Duplicate RPD%	%		1	[NA]
QC Zn - AB Spike Recovery%	%		84	[NA]

End of results

General comments: This report must not be reproduced except in full. This report relates to items tested as specified herein.
 Samples tested between date received and date reported. Accredited for compliance with ISO/IEC 17025 - Testing
 # NATA accreditation does not cover the performance of this service. Tests marked with * are subcontracted.
 LOR denotes 'Limit of Reporting' < denotes less than; > denotes greater than; ND denotes 'not detected'
 The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards

Specific comments:

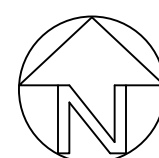
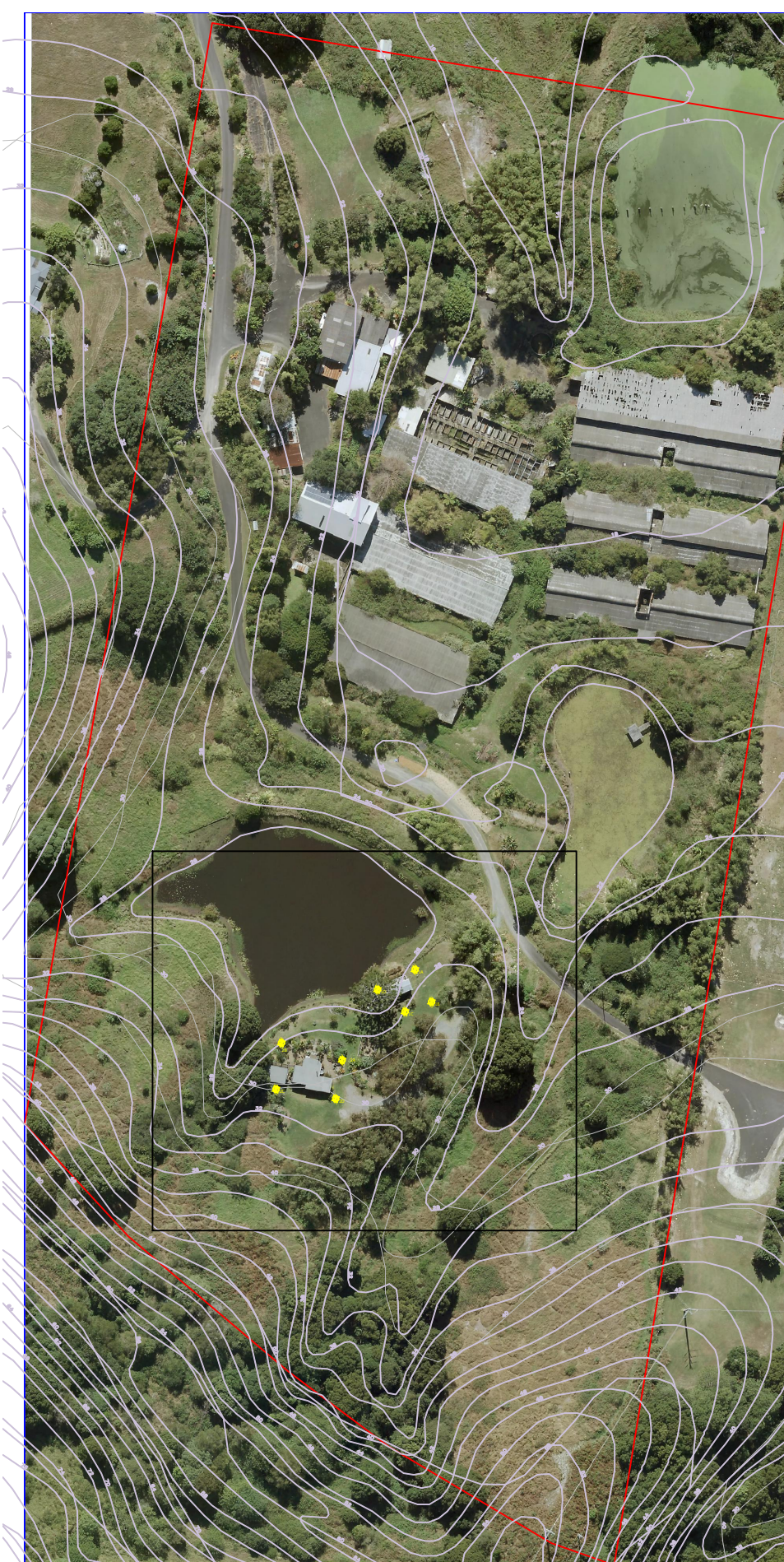

 M Window
 Laboratory Analyst
 Approved Authoriser



Source: NSW LPI Spatial Information Exchange (2021)
Date: 10/11/21
Project No. 21421-CL.docx
Scale: NTS

GREG ALDERSON AND ASSOCIATES
ABN 58 594 160 789
43 Main Street Clunes NSW 2480
Phone: (02) 6629 1552
Email: office@aldersonassociates.com.au

Exhibit No. 1
Subject Site
Lot 8 DP 8385 103 Yagers Lane, Skanners Shoot



THIS DRAWING IS CONFIDENTIAL AND IS THE PROPERTY OF GREG ALDERSON AND ASSOCIATES. IT MUST NOT BE DISCLOSED TO A THIRD PARTY, REPRODUCED, COPIED, OR LENT WITHOUT THE WRITTEN CONSENT OF THE PROPRIETOR.

Z:\JOBS\21\21421 - Maggie Schrieber - 103 Yagers Lane, Skinners Shoot\ENVIRONMENTAL\SEPP 55\21421_sepp55plan.dwg

43 Main Street, CLUNES NSW 2480
 PO Box 12344, CLUNES NSW 2480
 P:(02) 6629 1552 E:office@aldersonassociates.com.au
 W:aldersonassociates.com.au ABN 58 594 160 789

Client:
 M. Schrieber

Site address:
 Lot 8 DP 8385
 103 Yagers Lane
 Skinners Shoot

SOIL SAMPLING LOCATIONS			
Drawn: WA	Source: LIDAR, METROMAPS	EXHIBIT NO: 2	Date: 24-3-22
Scale: 1:500	Original Size: A3	Project: Rezoning Application	Revision: -
Job Number: 21421			



Greg Alderson Associates

Greg Alderson and Associates

ABN 58 594 160 789

43 Main Street

Clunes NSW 2480

T +61 2 6629 1552

office@aldersonassociates.com.au



Civil Engineering

Roads
Driveways
Stormwater
Flooding
Traffic
Earthworks



Structural Engineering

New Structures
Additions and Alterations
Foundations
Wind Bracing & Tie Down
Framing
Retaining Walls

House Plan Drafting
BASIX Certificates



Environmental

Contaminated Land (SEPP 55)
Acoustics & Noise
Wastewater
Acid Sulfate Soil
Water Quality
Ecology