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Preliminary Contaminated Land Assessment

Rezoning Proposal Lot 22 DP 1073165, 156 Stuart Street Mullumbimby

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Revision summary

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ATTACHMENTS

- Exhibit No. 1 – Site locality plan

EXECUTIVE SUMMARY

Greg Alderson and Associates have been commissioned by Byron Shire Council to undertake a preliminary contaminated land assessment at Lot 22 DP 1073165, 156 Stuart Street, Mullumbimby. SEPP 55 investigation is based on historical land usage of the property and forms is a Preliminary Assessment in accordance with NEPM (1999).

The subject land is currently zoned RE1 Public Recreation and classified Community land. It is proposed that the majority of the site is proposed to be rezoned to a residential zone and reclassification from Community to Operational land.

A site history was undertaken using historic aerial photographs, parish maps and Council files. The site remained cleared and was possibly used for cattle grazing. Cropping had occurred at the site at one time. The site also is relatively close to a former cattle dip, albeit separated by a creek and spatial distance therefore unlikely that contaminants from that site have migrated to the subject site. It is recommended that investigation be undertaken for organochlorines, organophosphates and heavy metals, being contaminants used in the dip site and potentially in the cropping area.

It is recommended that investigation be undertaken adjacent to the railway line due to it being a potential source of contamination due to the potential use of treated railway sleepers and asbestos from brake pads on trains. Although the potential of contamination is low due to the separation of the railway track to the actual subject land, it is recommended that further investigation is undertaken in the vicinity of the railway line as part of the subdivision process.

The likelihood of contamination at the site is considered to be low, however further investigation is warranted to ensure that the potential past land use, contaminating activities are addressed. It is recommended that this further investigation be undertaken as part of the subdivision process.

1. INTRODUCTION

Greg Alderson and Associates have been commissioned by Byron Shire Council to undertake a preliminary contaminated land assessment at Lot 22 DP 1073165, 156 Stuart Street, Mullumbimby for the proposed rezoning application. As required under Section 7 of SEPP 55, this assessment was conducted to determine if the investigation area was contaminated from past or present land uses and if it was suitable for the proposed change of zoning. The site was assessed for contamination in accordance with the requirements of the National Environmental Protection Measure 1999 (2013) (NEPM).

1.1. Background

The subject land is 28.5 hectares, zoned RE1 Public Recreation and classified Community land. The site consists of two areas either side of the Murwillumbah to Casino Railway Line, with only a small portion of approximately 3.5 hectares east of the rail line. It was originally purchased for playing fields (using section 94 funds) but more recently has been used, in part, for a community garden. It is understood that the site would be suitable for residential development, and therefore will require rezoning to a residential zone and reclassification from Community to Operational land. Furthermore, it is understood that the area which is currently being used for community garden (with Council consent) will not be part of the planning proposal and a residential zone would not apply to the site which is east of the railway line.

2. SCOPE OF WORK

This investigation is Tier 1 - preliminary site investigation. This assessment 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) and whether a detailed investigation is required if it is suspected that contamination is present.

The investigation is based on a site inspection, historical evidence provided by the client and information that has also been gathered by this office including aerial photographs from NSW Land & Property Information (NSW LPI).

The relevant guidelines used for the investigation are as follows:

- National Environmental Protection Measure (1999);
- NSW EPA (2000) Guidelines for Consultants Reporting Contaminated Sites

In accordance with NEPM (1999) the Preliminary Site Investigation the assessment has been undertaken using is based on a:

- a desktop study to collect basic site information;
- Review of Council records for the site;
- identification of the site characteristics (site location, land use, site layout, building construction, geological and hydrogeological setting, historical land uses and activities at the site);

The aim of the preliminary investigation is to:

• identify potential sources of contamination and determine potential contaminants of concern;

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- identify areas of potential contamination;
- identify potential human and ecological receptors; and
- identify potentially affected media (soil, sediment, groundwater, surface water, indoor and ambient air).

Research methodology used in this investigation included:

- Review of relevant documentation;
- Information obtained from the clients; and
- Site investigation

No soil sampling was undertaken as part of this assessment due to the time constraints, and information provided has determined the status of contamination at the site.

3. SITE IDENTIFICATION

Lot 22 DP 1073165, 156 Stuart Street, Mullumbimby. The centre of the site is located at MGA 56 GDA 94 E549073.809 N6840452.446. The subject site in its locality is presented in Exhibit No. 1..

4. HISTORY OF SITE

The history of the site presents that the property was used for agriculture until relatively recently the site was used for Community Gardens, which was approved through a Development Application.

4.1. Parish Maps

Parish maps present that the property was a larger rural holding, connected to the property to the east of the railway line, as shown in Figures 1 and 2.

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Figure 1: 1912 parish map (NSW LPI, 2016).

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Figure 2: 1938 parish map (NSW LPI, 2016).

It is understood that European timber getters were harvesting timber from the Mullumbimby area from the 1850's onwards. After 1900 dairy farming started becoming the main land use of areas that had been cleared by timber getters.

4.2. Aerial Photographs

Aerial Imagery sourced from NSW LPI was obtained to show land use of the investigation area. The aerial photographs from 1958, 1966, 1971 and 1979 present that there were no buildings on the site, however, cropping had occurred in 1971.

1958 Aerial Photograph – this photograph presents that the site had been cleared of trees and appears to be used for cattle grazing. No buildings are present. A cattle dip site is present to the north west of the property. Immediately to the north of the site on Stuart Street, is being used as a brick works.

1966 Aerial Photograph – this photograph presents that the site is in a similar situation to the 1958 aerial photography, with the site clear of large vegetation.

1971 Aerial Photograph – cropping is present on this site in the northern section adjacent to Saltwater Creek and from the centre to the southern boundary. It is most likely that the crops grown were cattle fodder/hay and not market garden. However, it is possible that the crops were sugarcane.

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1979 Aerial Photograph – this photograph does not provide clear detail of the site. However, it appears that the site is still vacant, cleared and not being used for any differing circumstances from the previous years. There are no crops evident.



Figure 3: 1958 aerial (NSW LPI, 2017)

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Figure 4: 1966 aerial (NSW LPI, 2017)

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Figure 5: 1971 aerial (NSW LPI, 2017)

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Figure 6: 1979 aerial (NSW LPI, 2017)

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Figure 7: 2010 aerial (NSW LPI, 2017)

The neighbouring site to the north (154 Stuart Street) was once a brickworks. It is understood from newspaper articles that the brickworks were granted approval in 1948 by the then Department of Building Materials (Trove: Digitalised newspapers, Northern Star 15 March, 1948). It is understood that the site contained a kiln, brick stamping machines and electric motors were used to drive the machinery (Trove: Digitalised newspapers, Tweed Daily Friday 21 May, 1948).

The historic aerial photography also presents the landuse to the north west of the subject site containing a cattle tick dip. The site now contains the former Mullumbimby Post Office which was moved to the site in 1984. However, the use of the site of a former cattle dip site would have caused contamination at that site. The dip site is known as 'Mullumbimby old'. Further discussion of this site is presented in Section 6.3.

4.3. Past Approvals

A records search was undertaken at Council to determine past development or building approvals.

10.2010.133 - Nursery shed and associated drainage

10.2010.293 - Amenities Building and Composting toilet

10.2015.159 - Replacement of site office (due to previous office burning down)

As part of the DA 10.2013.293 development application a contaminated land assessment was undertaken by EAL Consulting Services, in which nine composite samples, made from 36 point samples were undertaken. EAL Consulting Services had the samples analysed for heavy metals, organochlorine and organophosphates due to the site being used for agricultural and due to the close proximity of the former dip site (about 70 m to the corner of the property). Soil sampling was undertaken in the area of the approved community gardens, with results presenting no contamination.

5. SITE CONDITION AND SURROUNDING ENVIRONMENT

5.1. Site Investigation

Staff of this office investigated the subject site, which is accessed from Stuart Street, crossing Saltwater Creek via a low level causeway. The former Casino to Murwillumbah railway line transects the site towards the east. Agricultural properties neighbour the site to the south and tennis courts are located to the north east. The site contains a community garden accessed by an informal track from the causeway. The garden is well developed with numerous areas planted and contains small buildings. The remainder of the site appears to be vacant.

5.2. General Site Condition

The site appears to be in relatively good condition with little erosion evident, due to the low gradient of the site. The property has been cleared in the past and some weed species are now growing on the property, however the majority of the site is grass.

6. SITE CHARACTERISATION

6.1. Cropping

Some cropping appears to have occurred at some stage at the property, as it is evident in the aerial photograph from 1971. It is considered that the most likely crop was for cattle fodder, however it may have been for a market garden. NSW EPA (2005) states that pesticides registered for use in orchards and market gardens in NSW include both organic and inorganic compounds. The organics include organochlorines, organophosphates, carbamates, synthetic pyrethroids, triazines, phenoxyaliphatics, sulfonylureas and plant hormones. Inorganic compounds include arsenicals (which also often have a lead component), copper and mercury-based products.

From experience of assessments of market gardens, the most common contaminant found remaining in the soil is arsenic. It is most likely that the organic compounds breaking down overtime due to micro-organisms.

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Similar to lead, if arsenic was used at the site, it would remain in the upper soil profile adsorbed to the clay colloids and organic matter.

It is considered that a detailed assessment including soil testing should be undertaken of these areas, however, there is a low likelihood of contamination. It is expected that if chemicals were used that these chemicals would be evenly distributed unless there was a spillage of chemical at the site. It is normal that higher concentrations were found at areas where chemicals were mixed, and due to the lack of apparent structures identified on the aerial photographs it is unlikely that 'hot spot' of elevated levels of contaminants would occur at the site.

6.2. Cattle Dip Site

The site is about 70 m from the location of a former cattle dip site, being the 'Mullumbimby' cattle dip. The Department of Primary Industries (DPI) states that Mullumbimby old dip site has been demolished. This is defined as 'where the dip site has been partially or wholly dismantled or demolished prior to the introduction of the decommissioning policy. In many cases there is no physical signs of the dip ever being there'.

This is different to a site being remediated, which under DPI a remediated site is 'where the dip site has been demolished, extensive soil testing completed and any contaminated soil with Arsenic or DDT levels above human/environmental health thresholds is removed or securely buried. Please note that this status applies generally to where sites have been remediated by NSW DPI. Any other remediation initiated externally to us will not necessarily be registered and therefore must be checked for through Council.

A request for information regarding the dipsite was lodged with Byron Council and information from Council staff was that there was no information on file regarding the dip site.

The DPI information presents that the dip site started in 1923 and finished sometime in the 1970s, with the last registered use of chemical being in 1973 as shown in the chemical usage table below.

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Chemicals used in dip	Date first used
bath	
Arsenic	6/23
DDT	9/57
Benzene Hexachloride	12/54
Carbophenothion	7/62
Coumaphos	8/65
Ethion	3/67
Ethion Chlordimeform	8/71
DDT Benzene Hexachloride	6/58
Ethion Chlordimeform	10/73
Current Chemical	NONE
Dip bath status/contents	COVER

Table 1: Chemical Usage

Cattle dips are notorious sources of arsenic and DDT contamination which ceased to be used in dip baths in 1962 (NSW Agriculture, 1996) but may also be a source of contamination by organophosphates used to more recent times.

It is considered that the spatial separation and the fact that the subject site has been in use since the late 1940s indicates that there will be a low likelihood of contamination from the dip site to the subject site. It is not known if the dip site has been remediated or if soil samples were taken to determine the lateral and vertical extent of contamination. However, DIPMAC (1995) states that:

'The extent of contamination around a dip site is likely to be no more than 20 metres uphill or on the flat and 50 metres downhill of the dip bath. The potential for spread of the contamination is limited by the presence of gullies, rises in slope, roads, drains and creeks...'

Furthermore, NSW Agriculture (1996) also states that:

"...the bulk of contamination within 5 m of the edges of the bath and draining pen, although concentrations of concern may extend further. At sites where the slope away from the dip bath exceeds about 5° the contamination can extend down the hill for about 30 m from the dip bath."

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Figure 6: Average Arsenic contamination mg/kg at dipsites



Figure 7: Average DDT contamination mg/kg at dipsites

Figure 6 and 7 present the concentration of arsenic and DDT found at dipsites in the Northern Rivers (DIPMAC, 1995). The areas that are most likely area to contain the highest elevation of arsenic and DDT are adjacent to the dip bath and drain pen. High concentration of residue is also expected to be found in the chemical shed where spillages are most likely to have occurred. In 1955 when the use of arsenic was stopped in the baths (due to ticks becoming resistant to arsenic) and replaced with DDT, the arsenic was separated from the dip bath fluid by adding lime. This formed an insoluble arsenic compound which settled to the bottom of the bath, where then it was removed and buried beside the

bath or pumped out over the yard. It is most likely that a similar situation occurred when DDT was replaced (DPI, 2014).

Both arsenic and DDT are persistent in the environment, with the chemicals binding strongly to clay particles and organic matter, therefore leaching is limited through the profile. The spread of contamination, as depicted in Figure 6 and 7 reduces significantly away from the dip bath.

6.3. Railway Line

The Murwillumbah Casino railway line dissects the site and not been used for at least the past 15 years. Railway lines have the potential of containing contamination from:

- Chromated copper arsenate (CCA) and/or creosote treatment CCA or creosote contains hydrocarbons) were used to preserve the timber sleepers along railway lines from rotting and termite protection. Some leaching of these chemicals may have occurred however generally this will be within an area in close proximity to the sleepers.
- Asbestos asbestos was used in brake pads of trains, which may have dislodged when the train's brakes were used. It is unlikely that brakes were frequently used in this area of the track, and if used, the asbestos would be in close proximity to the railway lines.

Although the potential of contamination is low due to the separation of the railway track to the actual subject land, it is recommended that further investigation is undertaken in the vicinity of the railway line as part of the subdivision process.

7. CONCLUSION

A preliminary contaminated site investigation was undertaken as part of the rezoning process for Lot 22 DP 1073165, 156 Stuart Street, Mullumbimby. The SEPP 55 investigation is based on historical land usage of the property and forms is a Preliminary Assessment in accordance with NEPM (1999).

A site history was carried out to determine if any contaminating land uses or events had occurred in the investigation area. From the investigation of historic aerial photographs, parish maps and Council files it appears that there is potential for contamination being present at the site and warrants further investigation. However, it is expected that if contamination was at the site, it would be at concentrations that would be dealt with through typical remediation measures.

Cropping had occurred at the site at one time, and it is not known if chemicals were used, however, historically, arsenic was a common chemical used in market gardens. If arsenic was used it would be remaining in the upper soil profile, evenly distributed over the area. It is recommended that investigation be undertaken in the old cropping locations for organochlorines, organophosphates and heavy metals.

The property is 70 m from a former dip site which used organochlorines, organophosphates and arsenic. The Saltwater Creek and spatial separation reduces the risk of contamination, and an assessment by EAL Consulting services as part of the development application for the community gardens did not find elevated concentrations of these contaminants. However, a precautionary measure would be to undertake investigation for these contaminants as part of the subdivision process.

The railway line is a potential source of contamination due to the potential use of treated railway sleepers and asbestos from brake pads on trains. Although the potential of contamination is low due to the separation of the railway track to the actual subject land, it is recommended that further investigation is undertaken in the vicinity of the railway line as part of the subdivision process.

8. **REFERENCES**

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