

SEPP 55

Contamination Assessment Report

Planning Proposal to Amend Moree Plains Local Environmental Plan 2011

Proposed Rezoning of Land Lots 11, 12, 13, 46 and 227 in DP 755980 Kentucky Rd, Boggabilla

**Client: Bedajama Pty Ltd
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**Prepared by: SMK Consultants
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August 2013

Introduction

SMK Consultants has been engaged by Bedajama Pty Ltd to assess land involve in a proposal for rezoning on Lots 11, 12, 13, 46 and 227 in DP 755980 located the Kentucky Road area near Goondiwindi.

The subject land consists of 189 hectares of land that has been historically used for farming and grazing. Rural residential land surrounds three sides of the land. The southern edge of the land adjoins the Goondiwindi Boomi road (MR507). The land to the south and west of the applicant's land is used for intensive agriculture.

As part of the assessment of the proposal, an investigation is required to assess the potential for contamination of the property in regard to State Environmental Planning Policy No 55 – Remediation of Land. The assessment involves determining whether contamination is present and whether that contamination poses a risk to the proposed development of the land or whether the land requires remediation.

Scope of Work

The scope of this assessment involves a contamination assessment and preparation of recommendations for Lots 11, 12, 13, 46 and 227 in DP 755980.

The proposal for the investigation was to initially carry out a 'Preliminary Site Investigation' to determine if any contamination existed. If contamination was found to exist at a level that was considered unsuitable for the intended land use, the study should include recommendations for remediation and validation of the site to ensure the site is acceptable if the proposed rezoning application is approved.

Site Details & Land Use

The attached plan 203007-2 presents a locality plan of the property.

Land use on the property has been dominated by cultivation and farming. A disused gravel quarry affects the northern section of the land. Some of the land remains in a cultivated state. Other parts have been returned to pasture. The northern sector of the land consists of a cropped area within an open woodland and natural billabong.

The Site is located in a rural/primary production zone on the NSW side of the Macintyre River opposite the town of Goondiwindi.

The site has been the subject of extensive clearing for agriculture and grazing. The land has been cultivated for an extended period of greater than 30-years.

Historical and anecdotal evidence indicates that the site has not been used for indiscriminate disposal of waste or other potentially hazardous materials or dip sites.

Adjoining Land Use

Surrounding properties are developed for farming and cultivation. Property sizes range from rural residential areas to larger intensive farms that continue to be utilised for irrigated agriculture with the primary crop being cotton.

No industries of concern are located within a potential contaminating range of the subject land.

Site Condition

The site consists of cultivation paddocks and grazing country. Some areas that have not had significant disturbance include the remnant patch of vegetation that has been retained along the riverine corridor adjoining the Macintyre River.

The disused gravel pit area has not been actively remediated and remains in a succession phase of regrowth which has not provided extensive ground cover to date.

Cultivation areas within the lots provide an exposed surface to ensure open visual access to the surface soils and other disturbed areas.

The riverine corridor includes extensive ground cover on a seasonal basis which precludes a complete visual examination of the area. Access within the property is generally defined by internal farm tracks which provide an opportunity to access areas of disturbance that may have been used on a regular basis.

No specific areas were noted to show signs of contamination that is not part of normal practices on the land. Such practices include the application of various herbicides and pesticides for the control of weeds and pests as part of normal cropping activities.

Sampling and Analysis Plan

In accordance with NSW EPA Guidelines, a Preliminary Site Investigation was undertaken. The survey involved an assessment of previous land use and identification of potential contamination.

The object of the investigation was to determine whether contaminated areas existed on the property and whether these areas may impact on the proposed or future land use.

The method of assessment involved a visual assessment of the land and a discussion with the landowner to determine potential sources of chemical or other contamination. If this visual assessment identified contamination or a risk of contamination that may be considered as of concern to the environment or local populace, the methodology as proposed above would be extended to include detailed site sampling and assessment of the land.

Discussion and Recommendations

The investigation of the site has been carried out in accordance with the requirements of SEPP 55 and Guidelines published by the Environment Protection Authority.

The site investigation indicated that the property has been utilised for mainly cultivation and grazing. Some chemicals such as pesticides and herbicides are utilised as part of normal farming practices on the site and on adjacent land. Some minor residues of these chemicals may remain on the land for an extended period. Some of these residues tend to remain bound in the soil or biodegrade over time. The history of the site would indicate that recent chemicals used on the farming land were restricted to herbicides such as glyphosate and MCPA. The Glyphosate chemicals such as Roundup, have a short half-life and therefore do not represent any risk of residue at levels of concern after a period of several weeks.

The MCPA or other phenoxy herbicides have residual capacity when designed as such. The residual capacity allows the chemical to be bonded to the surface soil for control of mainly broad-leaf weeds during cropping for winter cereals such as wheat and barley. The chemicals are generally released by a reaction to moisture in the form of rain. Some minor residues may remain in the soil for a period of 12-18 months after application. The risk of these chemicals being present when dwellings are developed if the rezoning is approved is considered as minimal due to the potential period of 12-months to 2-years between development approval and occupation of the dwellings.

No significant spillage points were noted to be present on the site that would produce concerning levels of these residues that may impact on the proposed land use or present a risk to the adjoining land, including local flora and fauna.

Other minor areas of soil contamination were noted where diesel had been stored or motors had been fuelled. The contamination is relatively shallow. The potential health risk of these small areas is minor, however it is recommended that such sites are remediated prior to any dwelling approvals being issued. Remediation would consist of shallow excavation of the top 100 mm of soil and disposal of this soil or bioremediation of this soil at an appropriate location. The sites currently form part of existing farming operations and therefore the contamination resulting from minor spillages would continue until the land zoning and development proceeds to a construction phase. The contamination is not considered as significant.

No dip sites or historical dip or sheep spray yards were noted on the property.

In conclusion, the contamination that may be present on the land is considered as minor. The potential for impact on the local populace or the environment of low level soil residues is considered minor. A higher risk remains in relation to continued use of such chemicals; however the use of chemicals is controlled by both Government guidelines and farm management practices in order to meet the criteria set to minimise the impact of such chemicals on the environment and to meet accepted landowner responsibilities. This will include an appropriate withholding time between cessation of farming activity and construction of a dwelling if residual chemicals are utilised. The use of Glyphosate chemical will potentially continue as this chemical would be a suitable chemical for weed management during the development stage of the project if rezoning approval is issued.

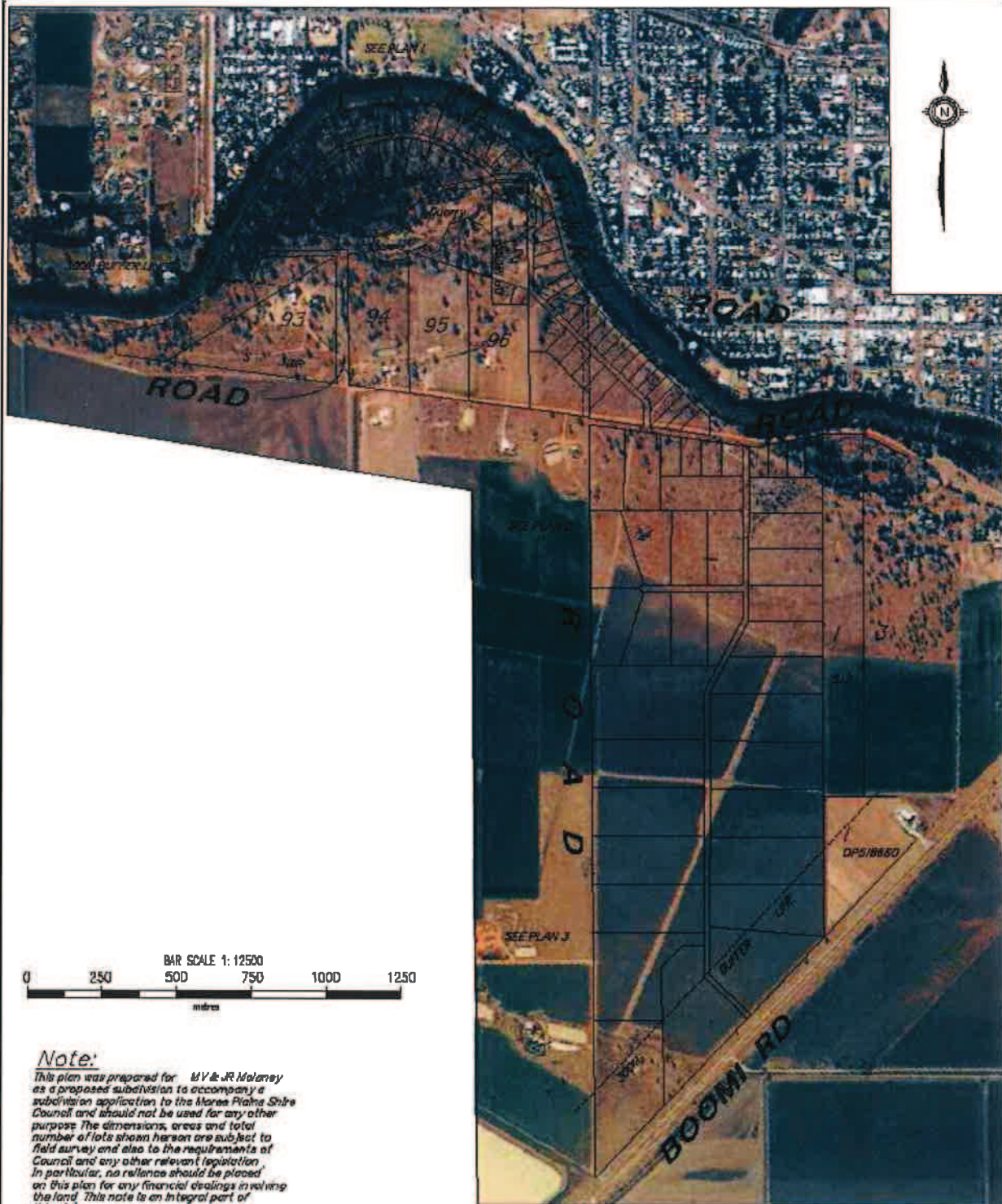
On this basis, the results of this assessment indicate that contamination issues on the site should not limit the potential to recommend the proposed rezoning of the land.

Limitations

This report is based on observation at the time of the investigation and history of the site provided by the Landholder. The conclusions and recommendations are based on the scope of works adopted, the methodology presented in this report and the results of any laboratory analysis undertaken for this investigation. If contamination or suspected contaminants are encountered on the site, it is recommended that the site should be appropriately restricted and advice sought from a suitably qualified and experienced consultant/supervisor to assess the material to determine appropriate action for its management and removal prior to any further work on the site.

Peter Taylor

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PLAN OF PROPOSED LOTS 1-60
BOOMI ROAD
BOGGABILLA

SCALE: 1:12500

203007-2

Drawn DJ 19/02/2004 Checked

FBK

203007

PARISH: BOGGABILLA
COUNTY: STAPITON

A3

Bedajama Pty Ltd

Proposed Rural Residential Subdivision Boomi Road, Boggabilla N.S.W.

Site Assessment Report For On-Site effluent disposal

April 2007

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Appendix 'A' – Site Sketch

1. Introduction

As requested, a soil assessment was performed at the proposed subdivision located at Boomi Road, Boggabilla on 22nd March 2007. The assessment was carried out to verify that the proposed parcels of land would be suitable for the installation of on-site effluent disposal systems.

It is proposed to undertake a lot reconfiguration, although the final layout of the proposed subdivision has not yet been determined. At the time of investigation, we have adopted the layout shown on drawing 203007-2, as prepared by M.F-G Shaw and associates, although other possible layouts have been prepared. However, given the large area to be subdivided, and the uniform results of our investigation, the recommendations given in this report will remain valid, should the layout be altered. It is our understanding that proposed lot sizes will range from approximately 4000m² up to 2.5ha.

2. Inspection and Testing

Twenty investigation test holes were excavated across the site, in the approximate locations shown on the attached plan. The soils were found to consist of very dark grey to black silty clays. The depth of this clay material is such that it is likely that surface application areas will lie within this layer.

From the investigation test holes, twenty samples were retrieved and returned to the laboratory of Soiltech Testing Services, for analysis. Textural classification was carried out on each sample in accordance with AS/NZS 1547:2000, and results of this testing are attached to this report.

Inspection, testing and our knowledge of soils in this area reveal Quaternary aged clays, derived from basaltic main range volcanics. Inspection and the area's proximity to the Macintyre River suggest that this material was deposited alluvially.

3. Discussion

Inspection of the site and soil samples reveals that the soils demonstrate an extremely high potential to swell and shrink with varying moisture conditions. Furthermore, due to the very high clay content, and the very small particle size of this clay, the soils are likely to exhibit very low permeability.

The suitability of these types of soils for traditional effluent disposal systems such as septic tanks and trench systems, essentially relies upon the soils ability to accept liquid wastes by infiltration into the soil matrix and to a lesser extent evaporation and transpiration.

These septic tank and trench systems, which rely largely on infiltration represent old technology which is rapidly being overtaken by newer more environmentally friendly systems that utilise aerobic digestion to produce a much higher quality effluent than that which is achievable from a septic tank.

Increases in the popularity of modern systems have seen a corresponding decrease in the price of such systems to the point where they are viable alternatives to septic tank / trench combinations.

Furthermore, modern domestic sewerage treatment systems do not rely heavily on infiltration into the soil matrix to effectively deal with domestic effluent but more on transpiration and evaporation. As a result, the ability of the in-situ soils to accept infiltration from the unit is not critical to its overall long term performance and operation.

Essentially such a system fitted with ground level irrigation could be set up to operate as a hydroponic system where the plants in the irrigation area obtain all nutrients from the effluent and the soil acts only as a medium to support the plant root systems. As such it is considered that any geotechnical testing of the soils physical properties are of limited value in light of the above comments.

It is understood that there are a number of these types of systems already in use in the area, which have been used successfully within Goondiwindi and surrounding districts. We also have been advised that they are serviced and installed by a local agent situated in Goondiwindi.

There are a number of advantages of using an onsite domestic sewage treatment system such as the abovementioned unit, some of which are:

- The wastewater is odourless, chlorinated and conforms to Australian Standard 1547-1994 Disposal Systems for Effluent from Domestic Premises.
- The above system has been reviewed and authorised to treat wastewater from a domestic dwelling by the DPI
- The system is capable of handling shock loads such as from washing machines and spas
- The need to be pumped out or de-sludged is negligible
- The system uses an aerobic digestion process to treat effluent thus producing a much higher quality effluent than from septic tanks and trenches.
- The system allows reuse of a precious commodity (water).

Another consideration which must be made is that of topography. The site generally falls very gently, with falls of less than 1%. Therefore, any on-site effluent treatment systems could be subject to localised inundation during periods of wet weather. At the time of final design of disposal systems, it will be necessary to ensure that no excess of free moisture be directed to or concentrated in the vicinity of disposal beds. This can be achieved by the use of earthen diversion mounds, or elevated disposal beds.

The size of disposal areas for evaporation/ transpiration beds for a given soil condition, depends upon the size of the proposed dwelling and number of bedrooms etc. However, these disposal areas typically range from 350-400m² for a 4 bedroom dwelling constructed in the type of soils present at this location. Due to the large size of the proposed allotments, there should be more than adequate available space for on-site effluent application, with the allotments able to meet the required set-back distances. The soil category identified from the drilling suggests that evapo-transpiration/absorption beds for all-waste water, and subsurface trickle irrigation systems would be most suitable for these sites.

It is brought to your attention that minimum setback distances apply, which may impact upon siting on some of the proposed allotments. Final design of treatment/disposal systems shall be carried out in accordance with AS/NZS 1547-2000. At the stage of planning individual building work, it will be essential that due consideration is given to siting application areas, given house and allotment size and layout. Recommended set-back distances from AS/NZS 1547-2000 are summarised overleaf:

Feature	Minimum Distance
Bank of watercourse, rivers, farm dams and drainage channels	50m
Water bores	10m
Property boundaries, paths and walkways	4m
Water edge of swimming pools	5m

Other than the requirements for setback from drainage channels, no public health or environmental concerns were apparent during the inspection.

4.0 Conclusion

The results of inspection and testing have shown that the soils across this site generally consist of silty clays. Soil category 6 reveals that these materials are generally very fine grained, heavy clays and would therefore be unsuitable for absorption trench type installations. The heavy clay soils result in low permeability and possible failure of absorption trenches.

As a result of the clay based nature of the soils, we have recommended the use of systems utilising evaporation and transpiration to dispose of treated wastewater generated from each site. Final design of treatment/disposal systems shall be carried out in accordance with AS/NZS 1547-2000, appropriate for each dwelling and site constraints.

The requirements of AS/NZS 1547-2000 can be met through detailed design of each system, and should meet the following requirements:

Setback distances from boundaries, stormwater drainage paths, dwellings and ancillary buildings, escarpment area,

Appropriate location of tanks and disposal areas (i.e. not located in natural water courses or close proximity to the Macintyre River),

Suitable size of tanks and disposal areas,

Correct maintenance programs for pumps, tanks, pipework and disposal beds,

The use of plants in disposal beds which demonstrate high water transpiration rates,

Diversion of overland stormwater flow from catchments upstream of the disposal areas

Due to the relative size of the allotments there should be more than adequate area to accommodate the type of systems recommended in this report, and achieve the minimum setback requirements.

Should you have any queries regarding the above, please contact Brendan Reid.

APPENDIX 'A'

Site Sketch



SITE SKETCH

Scale:—NTS

Revisions	Date				
A	Original issue				

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QUEENSLAND GOVERNMENT
QUALITY ASSURED
SUPPLIER

client	BEDAJAMA PTY LTD			
project	PROPOSED SUBDIVISION BOOMI ROAD, BOGGABILLA			
title	SITE SKETCH			
Survey	MFG	Drawn	BDR	Design
	—	MAR 07	MAR 07	MAR 07

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DISCREPANCY

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