



SEEC

Preliminary (Stage 1) Contamination Assessment

Lot 101, DP 1087389, Millingandi Road

Prepared by:

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Any recommendations contained in this report are based on an honest appraisal of the opportunities and constraints that existed at the site at the time of investigation, subject to the limited scope and resources available. Within the confines of the above statements and to the best of my knowledge, this report does not contain any incomplete or misleading information.

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11 June 2010

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Executive Summary

SEEC have undertaken a Stage 1 Preliminary Site Assessment of Lot 101, DP 1087389 Millingandi Road, Millingandi to assess the potential for contamination. It is required by NSW Department of Planning to accompany an application to subdivide the land into 10 new rural residential lots.

We have determined that the site has no history of contaminating activities within the last 70 years (approximately). There is an existing rural shed on part of Proposed Lot 7 that has an earth floor. It has deposits of hydrocarbon substances (fuel, oil) on it, but no more than would be reasonably expected for such a use. There did not appear to be any surface contamination outside of the shed walls.

The shed will remain on new Lot 7 after subdivision and will remain compatible with the future land use (the land is, and will continue to be, zoned 1 (C)). Any future owners are expected to use the shed in the same manner. That being so, we do not consider it necessary to further investigate the area. If at any time a more sensitive land use is proposed for the shed (e.g. house pad, pre-school etc. we recommend it be re-investigated including soil testing and remediation if necessary.

It is our opinion that the risk of contamination on the site is very low and that it is compatible with the proposed use (rural residential).

1 Scope of Work

Strategic Environmental and Engineering Consulting (SEEC) have been commissioned by Mr Neil Clements to provide this Stage 1 Preliminary Contamination Assessment for his land at Lot 101, DP 1087389 Millingandi Road, Millingandi. It is required to accompany an application to subdivide the land into 10 new rural residential lots. The site is, and will continue to be, zoned 1 (C).

The assessment contains the results of a site history undertaken on 9th December 2009 by interviewing Mrs Joyce Bucket, who has been associated with the site since the 1940's, and the current owner.

2 Site Identification

The site is Lot 101 DP 1087389 and is located on Millingandi Road, Millingandi, near Merimbula (Figure 1).



Figure 1 – Site Location. Princes Hwy to right.

3 Site History

3.1 Historical Use

A brief history of the site and any potential for contamination have been provided below. This information has been primarily sourced from Mrs Joyce Bucket, who owned the property from 1940's, and Mr Neil Clements, the current owner.

- (i) The site was and remains zoned for rural residential purposes (Zone 1 (C)).
- (ii) The current dwelling and two steel sheds were built by Mr Clements after he purchased the land in 1982;
- (iii) Mr Clements sold two lots that immediately adjoin the subject site (to the north) in 2005. One of these lots contains the original timber cottage, the other has been recently built on;
- (iv) Mr Clements has used the two steel sheds as typical rural sheds. He has stored machinery in them and made minor repairs on that machinery. The newest shed will remain on Lot 1 with the existing home. The oldest shed will remain on Proposed Lot 7. It has an earth floor and small spills of hydrocarbon substances are noticeable. However, there were no signs of chemical or oil storage/spills outside of the sheds when they were inspected by SEEC in December 2009.
- (v) Mr Clements bought the land from Mr Dick Whitby under whose ownership the land use was benign (not used for any particular purpose).
- (vi) Mr Whitby bought the subject land from Mr and Mrs Reg Bucket in 1970. They subdivided it from a much larger parcel of land which they had used as a dairy. The dairy itself was on adjoining land east of the subject site. Mrs Bucket has confirmed there were no chemicals used or stored on the subject site and there were no fuel bowzers. The subject land was used for grazing only, it was not used for cropping or for any orchard.
- (vii) No details are available for land use pre 1940.

3.2 Adjacent land

The site is bordered by similar land to the east and west and by rural land across Millingandi and Boggy Creek Roads. Land to the south is mostly undeveloped and mostly native bushland. It occupies steep, less fertile, land.

Land use on adjoining properties has been very similar to the subject site, particularly as the subject site was once part of a much larger parcel of land owned by Mr and Mrs Bucket. There were no signs of potentially contaminating activities on adjacent land when SEEC inspected the site in December 2009.

4 Site Conditions

4.1 General

Lot 101 occupies an area of 10.77 ha. It is a battle-axe block with a single access to Millingandi Road. At the time of inspection it was occupied by:

- ▶ a brick home with a roof area of about 300 m²
- ▶ two steel sheds, each with a roof area of about 280 m²
- ▶ two unformed driveways both about 3 m wide and totalling about 600 m;
- ▶ about 1,000 m² of sealed hardstand near the house.

The remainder of the site is cleared (save a few remnant eucalypts) and used for cattle and goat grazing.

4.2 Visual Inspection

The whole of the subject site was walked over during the site inspection and the neighbouring properties were visually inspected from the boundary fences. We found no signs of:

- ▶ discolouration or staining of soils, except on the earth floor of the steel shed on Proposed Lot 7;
- ▶ bare soil patches that could be attributed to contamination;
- ▶ dead vegetation that could be attributed to contamination;
- ▶ plant stress that could be attributed to contamination;
- ▶ waste chemical drums outside of the sheds; or
- ▶ unusual odours.

The buildings and roads/tracks are in reasonable condition.

4.3 Topographic Conditions

The site is dissected by an intermittent watercourse which was not flowing when inspected. It divides the site into two areas:

- (i) The east, which is formed on a side slope of mostly 10 percent gradient but locally up to 20 percent (on Lot 2); and
- (ii) The west, which is formed on a much gentler slope of about 5 percent.

The site elevation varies from about 50 m AHD in the far southeast to about 15 m AHD in the far north.

4.4 Surface and Subsurface Hydrology

The predominant drainage feature is the intermittent watercourse that dissects the site. It flows north through adjoining land to a 350 mm piped culvert under Boggy Creek Road. That pipe is likely to partially clog in moderate rainfall events and the flow would over-top Boggy Creek Road, pond on the other side, and then turn east and flow over Millingandi Road.

The watercourse has a catchment of 54 ha about 40 ha of which is undeveloped. Storm flows and flood levels in the watercourse are shown in SEEC Drawings 09000242-FS01 and 09000242-FS02. All floods, including the probable maximum flood, are predicted to be constrained in the channel. There is no flood-affected land outside of the channel confines.

The channel itself is unusually wide for such a small catchment. This is because flash-floods meander through its base, rather than being confined in a distinct bed/channel. Other drainage features are:

- ▶ Three small (<0.2 ML) farm dams (which might be removed); and
- ▶ A piped outlet approximately on the boundary of proposed Lots 8 and 9 that drains flow from upslope of the unformed road along the western boundary. This flow enters the existing small farm dam on Proposed Lot 8, although it will be removed.

As part of SEEC's site investigation five tests pits were dug to about 2,000 mm. None of the test pits had free groundwater or wet soils. Groundwater was not noted in a previous soil survey done by C D Watts and Associates, 2005, who achieved similar investigation depths. The watercourse channel is about 3 m deep and there were no signs of seepage when it was inspected. This suggests that the watertable is deeper than 3 m at this site.

According to NRATLAS the nearest bore is located about 750 m to west, in another property (GR -36.888333 149.859444). It is licensed as GW064566 and is for domestic stock use.

No specific water quality testing was done, the watercourse was not flowing when inspected and, according to Mr Clements, it rarely does flow.

4.5 Soils and Geology

4.5.1 Mapping

Soil Landscape mapping for this area was conducted by M. Tulau (1997), Department of Natural Resources (DNR, now part of the Department of Environment, Climate Change and Water DECCW). It shows that Lot 101 lies on two soil landscapes:

- (i) The Yellow Pinch Soil Landscape – mapped over most of the site extending from the south; and
- (ii) The Yellow Pinch Variant A soil landscape – mapped over the northern part of the site.

The Yellow Pinch soil landscape consists (mainly) of sandy loam topsoil over sandy clay loam or sandy clay subsoil. It is derived on sediments ranging from siltstone to conglomerate and so the soil profiles can be variable.

Much of the Yellow Pinch soil landscape occurs on steep slopes (up to 35 percent) but here slopes are mostly less than 10 percent (although on Lot 2 they are 20 percent). Therefore, we consider that most of this site is actually on the Yellow Pinch Variant A soil landscape.

Tulau (1997) identifies the following widespread soil landscape limitations:

- ▶ Generally extremely or very strongly acidic
- ▶ Generally hard setting
- ▶ Generally low water holding capacity
- ▶ Generally low fertility
- ▶ Generally high aluminum toxicity potential
- ▶ Generally water repellent.

4.5.2 Site Specific Soil Investigation

Soils were initially investigated by C D Watts and Associates (2005). However, as part of our investigation, we have described soil profiles in five new test pits dug by backhoe. Two of these test pits were dug east of the watercourse (one on a 20 percent slope and one on a 10 percent slope) and three test pits were dug west of the watercourse. The soil profiles are described below. The soil profiles differ significantly east and west of the watercourse.

East of the watercourse the soil profile is typically residual, with occasionally some colluvial influence:

TP1 and TP2

0 - 300 mm	Light grey sandy loam. Massive. 10 % coarse fragments where slope less than 15 percent. Up to 20 percent coarse fragments (colluvial influence) where slope 15 - 20 percent (Lot 2).
300 - (1000 -1200) mm	Mottled orange and brown medium clay, strongly pedal, <5% coarse fragments.
(1000-1200) - 1900 mm	Light grey, mottled orange brown, light to medium silty clay, moderately to strongly pedal. Remnant shale structure.
1900 mm+	Extremely weathered shale.

West of the watercourse the surface soils are alluvial gravels and sands that overlie residual soil at depth. The alluvial nature is attributed to the watercourse, with flash-floods having brought material down from steep, erodible lands south of this site.

TP3 (Lots 8/9)

0 - 500 mm	Light grey sandy loam . Massive. 40-50% coarse fragments including cobbles. Alluvial.
500 - 1000 mm	Light brown mottled orange strongly pedal sandy light clay, <10% coarse fragments. Residual.
1000 - 1700 mm	Grey mottled orange brown strongly pedal sandy light clay. Remnant shale structure. Residual.

TP4 (Lot 10)

0 - 300 mm	Light grey sandy loam. Massive. 10% coarse fragments including cobbles. Alluvial.
300 - 1800 mm+	Brown, slightly cemented, clayey sand to sandy clay loam. Moderately pedal. Common rounded quartz pebbles. Alluvial.

TP5 (Lots 9/10)

0 -400 mm	Light grey sandy loam. Massive. 40-50% coarse fragments including cobbles. Alluvial.
400 - 1900 mm	Brown sandy loam. Massive. 40-50% coarse fragments including cobbles. Alluvial.
1900 mm+	Grey mottled orange brown strongly pedal sandy light clay. Remnant shale structure. Residual.

Gravel-rich soils are also exposed in a bank of the watercourse on Lot 10.

None of the soils investigated showed evidence of contamination.

5 Potential for Contamination

The site history shows a benign use of the subject land, and adjoining land, since at least 1940. It has been mostly used for grazing purposes, originally as a dairy and lately as a rural residential lot.

The shed on Proposed Lot 7 has been used to store and maintain cars and tractors. It has an earth floor and there are signs of oil spillage, but no more than is typical for such a shed. There were no signs of spillage outside the shed.

6 Conclusions and Recommendations

Based on the benign history we do not consider it necessary to undertake additional investigations. It is our opinion that the risk of contamination on the site is very low and that the land is compatible with the proposed use (rural residential).

The exception is if the shed on Proposed Lot 7 is removed, in which case the use of that particular piece of land might change. If this were the case we recommend that a soil investigation be carried out to determine the extent of surface soil contamination. If the shed is to remain (as we understand it is) then the condition of the earth floor is compatible with the ongoing use and an investigation is not required.

7 References

Contaminated Sites - Guidelines for Consultants Reporting on Contaminated Sites. NSW Environmental Protection Authority (2000).

Tulau, M.J. (2005). *Soil landscapes of the Eden-Green cape 1:100 000 Sheet* DLWC