

Ministry of Education  
48 Hereford Street  
West End  
Christchurch

Attention: Deb Taylor

Dear Deb

## **17 Ranfurly Street, Gisborne. Review of previous investigation data**

Tonkin & Taylor Ltd (T+T) was engaged by the Ministry of Education (MoE) to undertake a review of existing site investigation information relating to the former Mobil Gisborne Terminal located at 17 Ranfurly Street, Gisborne.

This letter presents the findings of T+T's review and has been prepared in accordance with our proposal dated 22 June 2018.

### **1 Background and objectives**

The MoE is considering the purchase of land at 17 Ranfurly Street in Gisborne (the site) for the relocation of a Wananga. The site is a former Mobil Oil New Zealand (Mobil) terminal which was decommissioned during the late 1980s/early 1990s. Since that time the site has remained unused and covered with grass.

Ground contamination investigations have been undertaken at the site since its closure. T+T has been engaged to technically review the available site investigation information and assess what (if any) additional ground contamination investigations are required to characterise contamination conditions at the site to assist the MoE in assessing:

- Whether the site is suitable for the establishment of a Wananga.
- What ground contamination-related development implications (including costs related to soil disposal and health and safety) might be present.

### **2 Scope**

T+T has reviewed the following documents which have been provided by the MoE:

- Phase 2 Environmental Site Investigation, Former Mobil Gisborne Terminal (Site No 410-280). Prepared for Mobil Oil New Zealand Ltd. Pattle Delamore Partners, 16 November 2009.
- Environmental Management Plan – Former Mobil Gisborne Terminal. Prepared for Mobil Oil New Zealand Ltd. Pattle Delamore Partners, May 2013.
- Gisborne Terminal (410-280) Well Decommissioning. ERM New Zealand Ltd, 25 November 2013.

- Follow-up investigation commercial site. Geo & Hydro-K8 Ltd, 2 June 2015.

### 3 Summary of previous investigation information

#### 3.1 Site history

According to Pattle Delamore Partners (PDP, 2009), the western two thirds of the site operated as a storage and distribution centre for petroleum hydrocarbon products (including lubricants, leaded petrol, diesel and kerosene) between the early 1930s and late 1980s. The eastern third of the site was reportedly not used for petroleum storage or distribution, although it was used for the storage of empty fuel storage tanks. The use of the site (if any) prior to the establishment of the terminal is not documented by PDP (2009).

An aerial photograph reportedly dated 1986 is contained within the PDP (2009) report and shows that at this time the centre of the site contained the majority of the product storage facilities. A tank farm containing four above ground storage tanks is present, and an area of drum storage is present on the Ranfurly Street (southern) boundary. The western part of the site contained a gravel turning area and tank wagon filling stand. A lube oil store and garage was located in the north western corner of the site.

The last structures are understood to have been removed from the site in 1992. Since this time it is understood that the site has been unused, fully fenced and covered with grass.

#### 3.2 Previous investigations

##### 3.2.1 PDP investigations

Between 1992 and 2009 PDP completed a series of investigations and/or soil remediation exercises on behalf of Mobil. The PDP investigations focussed on the assessing the presence and extent of petroleum hydrocarbons and lead (an historic additive in petrol) in soil and groundwater. The investigations assessed relevant contaminant exposure pathways including the inhalation of hydrocarbon vapours, direct contact with contaminated soil and groundwater, and the offsite discharge of contaminated groundwater to surface water. Investigations undertaken between 1992 and 1996 are summarised in PDP (2009).

The key findings of these investigations can be summarised as:

- Soil within approximately 25% of the area of the site was subsequently excavated to 2.3 m below ground level (mbgl) to undergo remediation by land farming between 1992 and 1995. The purpose of the land farming was to reduce petroleum hydrocarbon concentration which had been detected at up to 34,000 mg/kg.
- At the time of its October 1996 report documenting the results of the land farming, PDP reported that soils within the unexcavated 75% of the site typically contained less than 500 mg/kg of hydrocarbons. Soils within the 'remediated' 25% contained less than 500 mg/kg in the upper 1.2 m and up to 1,000 mg between 1.2 and 2.3 mbgl. Lead concentrations in site soils were described by PDP as "low" but not otherwise quantified.
- Between 1996 and 2009 PDP reportedly completed numerous groundwater sampling events using monitoring wells installed on the site. During this period Mobil obtained a resource consent for the discharge of contaminants to groundwater from Gisborne District Council (GDC). According to PDP concentrations of hydrocarbons in groundwater declined between 1996 and 2009 to below the trigger values within the GDC discharge consent.
- In July 2009 PDP completed further soil and groundwater investigations at the site including the sampling of soil from 73 soil bores drilled on an approximate 8.5 m grid across the site. Groundwater samples were also collected from existing and newly installed monitoring wells.

- The July 2009 PDP investigation results indicate that (with limited exceptions) petroleum hydrocarbon concentrations in soils were at the time generally close to the limit of detection. Metal concentrations (including lead) were also generally low and with a limited number of exceptions were below current soil standards for residential and commercial/industrial land uses.
- Although globules of non-aqueous phase liquid (LNAPL - i.e. fuel or oils floating on water) were observed in bores drilled in the centre of the site, LNAPL was not observed in any of the on-site monitoring wells during the July 2009 investigation. Petroleum hydrocarbon concentrations in groundwater were either below or close to the limit of detection.

### **3.2.2 ERM Well decommissioning 2013**

According to the ERM report, on 25 July 2013, GDC formally accepted the surrender of the discharge consent held by Mobil for the discharge of contaminants to groundwater at the site. ERM subsequently completed the decommissioning of six on-site monitoring wells. LNAPL was not encountered in the wells during a groundwater level gauging round completed prior to decommissioning.

### **3.2.3 Geo & Hydro- K8 Ltd investigation June 2015**

This investigation report summarises the findings of a field screening exercise undertaken to provide an indication of lead concentrations in surface soil. Screening was conducted using a portable X-ray fluorescence analyser in areas in which elevated soil lead concentrations had been detected by PDP in July 2009. Three soil samples were collected to allow quantification of soil lead concentrations.

The report concludes that lead concentrations were below land use standards for residential and commercial/industrial land uses and that any use of the soil is highly unlikely to create a risk to human health. However, in T+Ts opinion this report does not significantly add to the characterisation of the site.

## **4 Summary of contaminant conditions and data gaps**

The site is a former Mobil fuel and oil terminal which operated for a period of approximately 50 years before being decommissioned from the late 1980s. Contaminants typically associated with such facilities include volatile petroleum hydrocarbons associated with the storage and handling of fuels; and non- volatile or semi-volatile petroleum hydrocarbons associated with oils and lubricants. In addition lead, which was historically used as an additive in petrol is also commonly encountered.

Soil and groundwater investigations completed at the site by PDP following closure identified the presence of elevated concentrations of petroleum hydrocarbons in site soils. In parts of the site hydrocarbon concentrations were sufficiently high to warrant on-site soil bioremediation.

PDP reports that the remediation was successful and significantly reduced petroleum hydrocarbon concentrations in soils. This is supported by soil analytical data from a detailed investigation completed by PDP in 2009 which generally shows that petroleum hydrocarbon concentrations were at or below detection limits with the exception of samples collected from the central west area of the site. Elevated concentrations of hydrocarbons were detected in this area within samples collected from near the depth of groundwater and where globules of LNAPL were observed in soil bores.

Despite these localised and elevated concentrations, the data do not indicate that hydrocarbon vapours are likely to be generated in the subsurface at a level that would require further remediation or the incorporation of gas protection measures into a future on-grade development. Should below grade structures such as basements be proposed, an updated assessment of soil vapour risk is likely to be required.

The PDP 2009 investigation comprised a detailed investigation of soil and groundwater at the site for contaminants generally associated with the operation of a fuel and oil terminal. Although the investigation is over nine years old, the analytical results provide a detailed characterisation of soil conditions at the time and hydrocarbon concentrations are only likely to have decreased since. Metal concentrations, including lead, are unlikely to have changed significantly since 2009.

It is likely that sub surface soils, particularly within the range of groundwater fluctuation may contain pockets of elevated hydrocarbon contamination and/or LNAPL and this will need to be considered in terms of soil disposal, soil reuse, the specification of underground pipework and dewatering. Elevated concentrations of lead have also been detected in soils and in some cases are above land use standards for residential land use. The presence of elevated lead will also need to be considered in terms of soil disposal, soil reuse, and dewatering

Further sampling and analysis could be undertaken prior to or during development to obtain updated hydrocarbon contamination data to clarify such issues soil disposal options. Similarly, groundwater sampling could be completed to assess potential treatment requirements and options for the discharge of dewatering water. However, the current hydrocarbon and metal analytical data is likely to be suitable for consenting and cost estimating purposes.

We note that GDC has indicated that a Tier II risk assessment is required to provide an updated assessment of potential risks to human health associated with contamination at the site. This requirement appears to relate to the age of the PDP (2009) data. We would recommend engaging with GDC to discuss its concerns. This may require a more detailed re-analysis/presentation of the existing investigation data.

None of the investigations completed to date have considered the potential for asbestos contamination to be present in soil as a result of the demolition of on-site structures. Given that the Mobil Terminal operated during a period when asbestos containing materials (ACMs) were routinely used in buildings, insulation and pipe gaskets it is considered likely that ACMs were present at the site during its operation. As such the potential for asbestos contamination to be present in soils cannot be discounted.

The presence of asbestos contamination in soil can significantly constrain its reuse, require additional health and safety controls during earthworks, limit the options for soil disposal and significantly increase soil disposal costs. Given the potential implications that the presence of asbestos in soils could have for the development of the site, the absence of asbestos in soils data for the site is a significant data gap. T+T recommends that an investigation for the presence of asbestos in soils is completed at the site. Such an investigation would be expected to comprise:

- The collection of soil samples to a nominal depth of 1 mbgl on a grid basis across the site. The depth of sampling would be based on an indicative maximum depth of development earthworks.
- Based on a site area of approximately 5,000 m<sup>2</sup> a minimum of 13 sample locations would be required for compliance with New Zealand Asbestos Guidelines<sup>1</sup>. Samples would need to be collected from different materials encountered at each location (e.g. topsoil, subsoil, fill).
- The collection and analysis of samples for asbestos in accordance with the New Zealand Asbestos Guidelines.

In summary, the following additional investigation/analysis is likely to be required to enable the MoE to identify potential ground-contamination development constraints:

- Discussion of existing data with GDC to clarify its concerns with respect to contamination related human health risks at the site.

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<sup>1</sup> New Zealand Guidelines for Assessing and Managing Asbestos in Soil. BRANZ. November 2017.

- Sampling of soil and groundwater to clarify soil and dewatering water disposal and management options.
- Sampling and analysis for asbestos in soils.

## 5 Applicability

This report has been prepared for the exclusive use of our client the Ministry of Education, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

Tonkin & Taylor Ltd

Environmental and Engineering Consultants

Report prepared by:



Paul Walker

Senior Contaminated Land Specialist

Authorised for Tonkin & Taylor Ltd by:



Peter Cochrane

Project Director

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