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TWEED VALLEY HOSPITAL – 771 CUDGEN ROAD

OCTIEF have been requested to provide a repsonse to the letter from Dr Allison Adams regarding a former cattle dip and arsenic contamination at the site at 771 Cudgen Road, Cudgen, and the comments and recommendations in the associated e-mail dated 24 January 2019 from Christina Low of the NSW Environment Protection Agency. The letter primarily relates to anecdotal evidence from Mr Brent Gibson, outlining the potential for a former cattle dip in the general area of the recently demolished site shed.

A response to the points raised in the letter from Dr Allison Adams are provided below :

The preliminary investigation of the site has been performed by OCTIEF included a contaminated site application request to Tweed Shire Council (TSC) and a review of the publically available map of cattle dip locations supplied by NSW Department of Primary Industries. The desktop investigation indicated that no known cattle dips were present at the site.

Based on the results of the preliminary site investigation, OCTIEF undertook targeted soil sampling in the vicinity of the main site shed and vehicle shed due to the historical storage and preparation of pesticides etc. associated with agricultural land use in the main shed representing a potential source of contamination at the site.

i) **"The report found higher than normal arsenic levels in the vicinity of the shed area of the site that were at least double that of all other samples tested however only a few samples were tested and the shed area was not investigated further in any great detail. It is therefore highly likely that this area in and around the shed has been overlooked as a contamination hotspot, and poses a real threat to the health and safety of workers on site….. The Main Shed and the Vehicle Shed had 3-4 times higher arsenic levels at 21 and 24 mg/kg respectively".** And that **"These findings support Mr Gibson's recount from his father of there being a cattle dip on site."**

It is acknowledged that samples HA4-0.15m and HA1-0.15m reported slightly elevated arsenic concentrations compared to the remainder of the site, the concentrations of 21mg/kg in sample (HA2-0.15m) and 24mg/kg in sample (HA4-0.15m) detected are below human health and ecological investiagtion level guidelines and are not considered indciative of a risk to the environment or human health.

The highest arsenic concentration detected in HA4-0.15m was vertically delineated by analysis of sample HA4-0.5m which reported an arsenic concentration of 5.1mg/kg, which is consistent with other soil samples collected across the site. The detection of slighlty elevated arsenic concentrations in the surface samples in the vicinity of the sheds is considered most likely to be associated with the known historical activity of storage and use of agricultural chemicals (with arsenical pesticides being commonly used).

Further invesitgation works to address the anecdotal information regarding the potential cattle dip in the vicinity of the shed are outlined in the revised Remediation Action Plan. Due to the absence of any documentation regarding the location of the potential dip, testpitting across the identified area following

the removal of surface infrastructure and concrete slabs is required to enable characterisation of the area.

ii) **"In addition, the dump area of the site also contains elevated levels of arsenic compared to the paddock areas with levels of 8.6 mg/kg. This area has also not been tested in full due to vegetation impeding access as stated in the Octief report (p. vi). It is plausible that previous users of the site may have disposed of highly toxic chemicals such as arsenic in the area and then avoided maintaining the area for this reason, hence the overgrowth".**

While some areas of the farm dump were not accessible, two targeted soil sampling locations were completed within the area of the dump during the detailed site investigation. These locations reported no elevated concentrations of potential contaminants, and given the size of the farm dump, two targeted samples are considered adequate to characterise the soil in this area.

The concentration of 8.6mg/kg in sample HA7-0.5mg/kg mentioned above is within the range of arsenic concentrations detected in samples collected from across the cultivated areas of the site and are not considered indicative of contamination.

OCTIEF recommended that a suitably qualified environmental consultant should be onsite during removal of vegetation of farm dump to ensure remaining materials in the dump are inert waste, but no additional soil testing in the area is considered to be required unless potentially contaminating material is identified once vegetation is cleared. It is understood that the farm dump has now been cleared o vegetation under the supervison of Cavvanba Consulting.

A response to the comments and responses raised in the e-mail dated 24 Janaury 2019 are provided below:

Comment a)

The concentrations of arsenic in the soil samples reported near the shed location were found to be elevated above what was been reported for the other samples collected from across the development area. However, the EPA agrees with Octief that all arsenic soil results reported were below appropriate health risk screening criteria. Nonetheless, it appears that the assessment did not identify the likelihood of cattle tick dip activities the redevelopment area, and it did not design the sampling program to consider this. Further data gap investigations involving targeted soil sampling should be conducted to confirm presence or absence of cattle tick dip infrastructure and contamination on this site. (Response also relates to recommendations 2 and 3).

Following consultation with the site auditor, a data gap investigation to address the anecdotal information regarding the potential for a cattle dip on the site has been included in a revision of the Remediation Action Plan (RAP) for the site. Due to the absence of any documentation regarding the location of the potential dip, testpitting across the identified area following the removal of surface infrastructure and concrete slabs is required to enable characterisation of the area.

b) Some asbestos was reported to be present near an on site chemical and storage shed. The EPA recommends the extent of any on-site contamination should be confirmed to inform remediation.

Based on soil sampling undertaken OCTIEF have prepared a RAP for remediation of the identified asbestos impacted area in the vicinity of the site shed, and understand that Cavvanba Consulting have undertaken additional sampling for asbestos following shed demolition works and have also prepared a RAP addendum document.

c) A small farm dump was reported to be located on the edge of a vegetated area in the northwest corner of the site. A visual inspection of the dump identified only inert building materials such as fencing posts, and paving bricks, however due to extensive coverage by vegetation the full extent of the dump could not be clearly determined. Furthermore, farm dams on site were reported as having restricted access and as such have not been fully investigated for contamination. The EPA considers therefore that there are several locations on this site that should to be further investigated for contamination. (also relates in part to recommendation 1)

As outlined above, while some areas of the farm dump were not accessible, two targeted soil sampling locations were completed within the area of the dump during the detailed site investigation. These locations reported no elevated concentrations of potential contaminants, and given the size of the farm dump, two targeted samples are considered adequate to characterise the soil in this area.

OCTIEF recommended that a suitably qualified environmental consultant should be onsite during removal of vegetation of farm dump to ensure remaining materials in the dump are inert waste, but no additional soil testing in the area is considered to be required unless potentially contaminating material is identified once vegetation is cleared. It is understood that the farm dump has now been cleared of vegetation and further assessed under the supervison of Cavvanba Consulting.

As noted in the report, while access was restricted around the dam , sediment samples and water samples were collected from the dam itself. Based on the results of sampling undertaken (including soil sampling results from the adjacent areas of the site), and the size of the dam, OCTIEF do not believe additional samples around the dam is warranted.

The RAP prepared for the site includes an Unexpected Finds Protocol to address any unexpected finds.

d) The groundwater investigation included in the Octief contamination assessment is limited, reporting on sampling from one well only that was advanced for geotechnical purposes. This is insufficient to provide an understanding of groundwater conditions across the entire site. Elevated concentrations of zinc and copper were reported in the single well. The EPA recommends further groundwater investigations should be undertaken. (also relates in part to recommendation 1)

Elevated zinc and copper concentrations reported in the groundwater sample collected are considered most likely to be naturally occurring. No evidence of elevated copper or zinc were detected in soil deeper than 0.15m during the site investigation works. The sample was unfiltered and as such may over-represent dissolved phase metal concentrations

Soil sampling undertaken across the site indicated site contamination onsite is limited to surface asbestos contamination around the site and lead contamination associated with lead paint in the house, both of which have been vertically delineated at depths <1m at the site, and as such no

evidence of contaminating activities with the potential to contaminate underlying groundwater was identified during the detailed site investigation.

The geotechnical investigation undertaken in the area of the proposed hospital development identified underlying groundwater was encountered in a semi confined fractured basalt aquifer at depths of approximately 16m below ground surface , overlain by a high strength slightly weathered basalt.

Considering the risk-based factors outlined in the guidelines (NEPC 2013) in relation to consideration of groundwater impacts, there is no valid reason to undertake broader groundwater investigations at the site at this stage (potential cattle dip aside – which is discussed below).

Following consultation with the site auditor, a data gap investigation to address the anecdotal information regarding the potential for a cattle dip on the site has been included in a revision of the Remediation Action Plan (RAP) for the site. The revised RAP will include contingency actions for the installation of additional groundwater wells In the event that the data gap investigation identifies elevated arsenic concentrations associated with a cattle dip.

e) Octief considered that the works undertaken at the site had sufficiently characterised the site to enable assessment as suitable for the SSD application subject to implementation of a Remedial Action Plan. The EPA agrees remediation will be required at the site however further contamination assessments should be required inform the remediation, to address the data gaps identified above.

Following consultation with the site auditor, a data gap investigation to address the anecdotal information regarding the potential for a cattle dip on the site has been included in a revision of the Remediation Action Plan (RAP) for the site.

Recommendation 4 & 5)

Investigation was undertaken in accordance with the guidelines made or endorsed by the NSW EPA, as outlined in the PSI &DSI site report. PSI & DSI Report was reviewed by a CEnvP.

Recommendation 6)

Undertaken by Cavvanba Consulting

Recommendation 8)

RAP prepared for the site includes an unexpected finds protocol , as outlined above, a revised RAP has also been prepared incorporating a data gap investigation to address the anecdotal information regarding the potential for a cattle dip on the site.

Recommendation 9)

No contamination identified onsite to date meets the trigger in the EPA '*Guidelines for the Duty to Report Contamination*') for notification in accordance with requirements of section 60 of the Contaminated Land Management Act'.

Recommendation 10)

RAP documents have been prepared to address contamination that has been identified onsite.

Recommendation 11)

The processes outlined in *State Environmental Planning Policy 55 - Remediation of Land (SEPP55)* to assess the suitability of the land and any remediation required in relation to the proposed use has been followed.

Based on the results of the Preliminary and Detailed Site investigation undertaken at the site, OCTIEF considers that the works undertaken at the site have sufficiently characterised the site to enable assessment as suitable for the proposed development subject to implementation of the Remediation Action Plan.

The data gap investigation to address the anecdotal information regarding the potential for a cattle dip on the site has been included in a revision of the Remediation Action Plan (RAP) for the site such that the ability to make the site suitable (irrespective of what is found during the data gap investigation) is not affected.