NSW GOVERNMENT | Department of Primary Industries

OUT15/36055

Ms Deana Burn
Industry Assessments
NSW Department of Planning and Environment
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Dear Ms Burn,

Lucas Heights Resource Recovery Park Project (SSD_6835)
Response to exhibition of Environmental Impact Statement

I refer to your email dated 3 November 2015 requesting advice from the Department of Primary Industries (DPI) in respect to the above matter.

Comment has been sought from DPI Water, Fisheries, Agriculture and Lands. Any further referrals to DPI can be sent by email to landuse.enquiries@dpi.nsw.gov.au. DPI Agriculture, Lands and Fisheries have no issues. DPI Water comments are provided below.

The matters raised here by DPI should be considered in the final project design and ongoing management plans, however should not be considered an impediment to determination of this project.

Comment by DPI Water
DPI Water has reviewed the Environmental Impact Statement (EIS) and provides detailed comments in Attachment A, and the following comments:

In relation to Mill Creek and riparian corridor, DPI Water recommends:

- The project clarifies the riparian widths that are proposed to be established along either side of Mill Creek on the site both during the operation of the project and following site closure.

- A Mill Creek Stream Rehabilitation and Stabilisation and Vegetation Management Plan should be be prepared for the rehabilitation of new section of the realigned creek and for the rehabilitation of Mill Creek and the riparian corridor following site closure.

- Consideration is given to locating the proposed Garden Organics (GO) storage dam to the south of the GO facility on land that is already cleared of native vegetation rather than locating it adjacent to Mill Creek on land that is currently vegetated with native vegetation.

- The proposed sediment pond/detention pond which is proposed to be located north of the ARRT facility is located elsewhere on the site to avoid potential impacts on the Coastal Upland Swamp.

- A scaled plan is provided which shows the location of the Asset protection zone (APZ) requirements, the riparian corridor footprint and the proposal. Where possible, it is recommended the layout is designed so that the APZ is located outside the riparian corridor.

- The water quality monitoring parameters target the potential impacts of the landfill leachate. This would assist validate whether the proposed reprofiling has reduced the potential risk of leachate being discharged off site.

- Additional water quality sampling is undertaken prior to the project commencing.

- Additional baseline aquatic monitoring is undertaken prior to the project commencing over a range of seasons and weather conditions in order to assess change.

- Additional reference/control sites are added to the macroinvertebrate sampling program.

- The water quality, macroinvertebrate and aquatic/riparian habitat monitoring continues once the project commences and the monitoring program is undertaken for the duration of the operation of the project to assess any potential impacts on the aquatic ecology downstream of the site.

- Works on waterfront land should be undertaken in accordance with the *Guidelines for Controlled Activities on Waterfront Land* (DPI, 2012)

In relation to groundwater, DPI Water requests additional information to clarify the current situation and to inform the proposed future management actions:
In particular, DPI Water seeks improvement in the following key considerations. These can generally be addressed in the final project design, or management plans developed in consultation with DPI Water.

- Monitoring bore coverage should be improved across the Waste Management Centre domain for the purpose of identifying the potential leachate pathways within the shallow sandstone aquifer.

- There is an assessment of post-closure potential lead in soil contamination in the NW corner of the site due to the clay-shooting range. Heavy metals associated with the lead shot residue have the potential to be mobilised in the acid soil and groundwater regime. These matters need to be addressed at or before closure.

- Additional monitoring of heavy metal contamination from purpose-built bores installed down gradient of the clay shooting range.

- Refinement of the management plans to include additional monitoring and revised trigger levels (e.g. lead concentrations down gradient of the clay shooting range) both during operation and post-closure.

- Maintenance of the leachate management system, as described in the management plans, to include regular periodic cleaning (i.e. flushing and repair) of the leachate system piping.

- Clarification of the current number, location and construction of the existing monitoring bores so that additional targeted installations can be designed to improve the likelihood of leachate detection in groundwater if leaks occur (i.e. sentinel monitoring in appropriate locations).

DPI Water would be available to discuss with the DP&E and Proponent any of the above issues should it be required.

Yours sincerely

Mitchell Isaacs
Director, Planning Policy & Assessment Advice
18/12/2015

Attachment A

Lucas Heights Resource Recovery Park Project (SSD_6835)
Response to exhibition of EIS
Detailed comments - DPI Water

DPI Water provides the following detailed comment on the EIS for the Lucas Heights Resource Recovery Park (LHRRP) expansion project:

Aquatic Assessment /Macroinvertebrate sampling

Water quality monitoring can be improved to ensure adequate monitoring of leachate and stormwater runoff - the water quality parameters don't appear to focus on the potential impacts of the leachate. The monitoring program needs to provide details on:

- how the leachate/stormwater runoff may affect biota (ie what's in the leachate/stormwater that could affect stream biota).

- what the landfill leachate might contain so as to guide the water quality monitoring and clarify whether the water quality monitoring parameters target this.

The inclusion of parameters that target the potential impacts of the landfill leachate will assist to validate whether reprofiling has reduced the potential risk of leachate being discharged off-site and potential impacts to surface water.

The report refers to the 2013-2014, River Health Monitoring program which has undertaken 5 years of monitoring in the Georges River catchment of water quality, vegetation and macroinvertebrates (page 30) but this monitoring may or may not continue and it is not considered appropriate to rely on another program to monitor this State Significant Development. It may provide additional information, but it was not designed to test the effects of the landfill.

It is unclear if the project proposes to undertake any additional water quality sampling prior to the project commencing, as only a single round of sampling was undertaken. Additional sampling prior to development should be required.

It is recommended the monitoring is more frequent (for example monthly), and it measures relevant parameters at appropriate times - focusing on leachate/high nutrients etc. during times when groundwater will be the major source of stream flow. There also should be some sort of event sampling focusing on stormwater effects, particularly as the report acknowledges that a significant rainfall event which occurred in the 24 hours prior to undertaking the fieldwork may have influenced the results (page 20).

Appendix T (Garden Organic Operation Environmental Management Plan) notes that any surface water discharged to Mill Creek from a storage dam or pond is to be monitored and tested to confirm that it meets EPL requirements before being discharged (Section 9.1.1, page 9.1). It is noted the parameters listed to monitor the leachate dam differ to the water quality parameters that were measured at the monitoring locations as outlined in Appendix C of Appendix H (see Section 9.1.3 of Appendix T and Section 4.2.2 of Appendix C of Appendix H). It is suggested Sections 9.1.1 and 9.1.3 of Appendix T clarify if the testing will also incorporate the water quality parameters listed in Section 4.2.2 of Appendix C of Appendix H.

It is also unclear if the project proposes to undertake any additional baseline macroinvertebrate sampling prior to the project commencing. For example, the report notes further sampling in spring and/or an ongoing macroinvertebrate monitoring program would allow for a more comprehensive analysis of macroinvertebrate community composition (Section 6.5.1, page 30)

but it recommends further investigation is undertaken of the habitat condition / macroinvertebrate populations every three years commencing soon after reprofiling works commence (Section 8). It is recommended the proponent undertakes additional baseline aquatic monitoring prior to the project commencing over a range of seasons and weather conditions in order to assess change.

The report hasn't used control sites but it refers to recent studies in the Georges River catchment which found that urban streams throughout the catchment contain macroinvertebrate communities dominated by pollution tolerant species with little or no pollution sensitive species present. As noted above, it is not considered appropriate to rely on another program to monitor this SSD as the program was not designed to test the effects of the landfill. Ideally some extra reference/control sites should be added to the macroinvertebrate sampling program. A single reference is inadequate (MCUP). In addition, MCUP is probably an intermittent stream and maybe already affected by stormwater runoff from the site (Fig. 3.1, Appendix A – Staging Drainage Plans). If extra sites are not possible, the monitoring should focus on AUSRIVAS results, which predict the invertebrate assemblage that should occur in the absence of any impact from reference sites.

If the project is approved, DPI Water recommends monitoring continues once the project commences and the monitoring program is undertaken for the duration of the operation of the project to assess any potential impacts on the aquatic ecology downstream of the site. It is recommended the proponent repeats the sampling more frequently than every three years and this sampling is undertaken over a range of seasons and weather conditions. It is recommended the macroinvertebrate sampling is undertaken annually or twice per year.

Groundwater

(i) Groundwater levels and presence of leachate

The issue of groundwater levels in and around the site, and their relationship to the hydrogeological setting has been discussed in Sections 3.5 and 3.6 (Appendix I). This is an important matter as the ultimate fate of migrating leachate is into the Hawkesbury Sandstone formation leading to the Mill Creek Valley and beyond to the north-west (Deadman's Creek Valley) with likely flow into the George's River around 4km to the north. The key aspects of the prevailing hydrogeological system have been described as follows and indicate groundwater flow (and hence any included leachate) is likely to be associated with fractures at two different depths.

- High angle jointing systems are likely to provide the main pathway for vertical groundwater migration.
- Major pathways for lateral movement are likely to be sub-horizontal fissures associated with bedding plans.
- Groundwater flow is primarily expected to be within a laterally continuous fracture zone located at the depths of 20 to 50m bgl and between elevations of 74 to 85m AHD, which is expected to extend further down Mill Creek valley.
- There is 20 to 25m of low permeability rock located between the base of the landfill/Mill Creek Valley and the moderately permeable fracture zone interpreted to exist between elevations of 74 to 85 m AHD.

Consequently, groundwater monitoring has, and needs, to be established so that any leachate-affected groundwater is suitably recognised in the Hawkesbury Sandstone aquifer system.

There are two areas of particular interest for the project as it develops:

A. GO and ARRT sites: Groundwater monitoring for the relocated and expanded composting facility (GO) and the waste sorting and recovery facility (ARRT) has been proposed to be addressed by the installation of additional monitoring piezometers and development of event trigger plans – Section 24 and especially Table 24.1 which details new monitoring bores.

This is considered to be a satisfactory response.

B. Enlarged landfill overall (LHRRP): -Longer term monitoring for the whole, expanded landfill site (LHRRP).

   At present 11 clustered monitoring bores are prescribed for sampling and consideration in regard to monitoring the existing groundwater situation and detecting potential leachate effects on the groundwater system. This system should be improved for the proper detection of leachate in groundwater systems to the north of the LHRRP.

The measurement of SWLs in groundwater monitoring bores needs to be more extensive north (and down-gradient) of the project site. Additional, regular monitoring and reporting from at least bores BH31, MB021, MB022, BH24 should be introduced, and further consideration be given to including additional, existent bores located on Lot 2 DP 1032102. The additionally sampled bores MB044 and MB045, described in the project's "Groundwater Assessment" (Appendix I), should also be included for regular monitoring.

(ii) Leachate generation

The Proponent has undertaken an extensive analysis of leachate generation (Appendix J) in respect of the proposed increased filling, and placed this properly into the context of present leachate generation and the on-going situation as if the proposed development had not taken place.

The analysis has taken account of existing leachate volumes, considerations of the leachate collection system design and function, typical climate conditions at the site and future proposed designs for the landfill capping. Numerical modelling has then followed and forms the basis of most recommendations regarding the future developments and capacity of the system. The analysis and considerations are satisfactorily developed.

The Proponent argues that the finished project will result in a lower level of leachate development than is presently seen. This contention is based on the reprofiling of landfill side slopes which facilitate surface runoff, the removal of ponding areas, and the construction of a greatly improved final capping compared to the present. An important matter is whether the Proponent's central conclusions - that the overall amount of leachate will be reduced is correct; since if it is incorrect, there are potentially increased impacts on the underlying groundwater systems.

The Proponent has addressed the matter of ensuring that the existing leachate management system keeps functioning correctly in Section 5.3 (Appendix J) – "Operational mitigation issues". These proposals could be strengthened by ensuring that, where possible, the leachate collection system be cleaned and flushed from time to time to ensure its continued efficient operation; this is an accepted technique for important sub-soil drainage systems - here the leachate system is equivalent to this.

Conclusions

With respect to groundwater for this development application and the response for Lucas Heights Resource Recovery Park - Expansion Project (SSD-6835), DPI Water considers this proposal to be adequate and most likely an improvement on the existing site condition. For example, the re-profiling of the landfill cap will significantly (25%) reduce rainfall infiltration rates and therefore also reduce the volumes entering the leachate management system.

The EIS illustrates the predictions that as landfilling increases the included watertable rises within the landfill, and down-gradient of the landfill regional water table levels fluctuate in response to the amount of groundwater in the system. Given this historic situation and the site geology there is no significant concern as to any major alterations in groundwater impacts, flow direction changes or unforeseen impacts resulting from the project's variation of footprints, and the re-positioning of the GO and ARRT facilities. The Proponent is required to monitor groundwater quality at 11 locations around the greater site as specified in their Environmental Protection Licence (EPL No 5065) (from Appendix I – groundwater assessment).

Recommendations

DPI Water requires additional information to clarify the current situation and to inform the proposed future management actions. In particular, DPI Water seeks improvement in the following key considerations:

- More comprehensive monitoring bore coverage across the Waste Management Centre domain for the purpose of identifying the potential leachate pathways within the shallow sandstone aquifer.
- There is an assessment of post-closure potential lead in soil contamination in the NW corner of the site due to the clay-shooting range. Heavy metals associated with the lead shot residue have the potential to be mobilised in the acid soil and groundwater regime. These matters need to be addressed at or before closure.
- Additional monitoring of heavy metal contamination from purpose-built bores installed down gradient of the clay shooting range.
- Refinement of the management plans to include additional monitoring and revised trigger levels (e.g. lead concentrations down gradient of the clay shooting range) both during operation and post-closure.
- Maintenance of the leachate management system, as described in the management plans, to include regular periodic cleaning (i.e. flushing and repair) of the leachate system piping.
- Clarification of the current number, location and construction of the existing monitoring bores so that additional targeted installations can be designed to improve the likelihood of leachate detection in groundwater if leaks occur (i.e. sentinel monitoring in appropriate locations).

End Attachment A