

Environment Agency
Via Email

Monday 8 July 2024

Ref: K6143/ENV/LT/02

**Re: Middlemarsh Landfill Site Leachate Irrigation Scheme – K6143
Request for Further Information**

Dear Sir/Madam,

Please find below responses to the request for further information raised on 25th June 2024. This is a partial response for specific questions and supply of updated information, since the original submission of the application in 2022. A further response will be made for the outstanding requests required prior to permit determination, under separate cover.

As advised within the request for further information, the correct application charge was not originally applied. A further payment of £2,477 has been made to the Environment Agency on 25th June 2024 under reference 'EPR/BV4410IC/V008' which included payment for the review of the Waste Recovery Plan (WRP) and an Odour Management Plan (OMP).

We believe an overpayment has been made, as it has been considered unnecessary as part of this response to submit an OMP. Furthermore, a Waste Recovery Plan (WRP) fee of £1,231 was made to the Environment Agency on 5th June 2020 under reference 'PSCAPPFCCEN301', as confirmed in an email submitted to PSC@environment-agency.gov.uk from benking@terraconsult.co.uk at 16:44 on 5th June 2020. Consequently, we request that a refund is issued to the Operator FCC Environment (UK) Limited.

This response relates to the following questions:

- Q1 Sensitive Receptors
- Q2 Odour Risk Management
- Q3 Clarification of irrigation scheme design
- Q4 Infiltration Strategy
- Q5 Surface Water Management Plan (SWMP)
- Q6 Competence Management System certification

Q1 In your Landfill Irrigation Scheme Risk Assessment (ref: 14-K6143-ENV-R03 Oct 22 in Appendix D of Supporting Statement and non-technical summary ref: 14-K6143-ENV-R05) – provide a list of all sensitive receptors within the vicinity of the site and assess the risks posed by the proposed activity

Potentially sensitive receptors have been identified and assessed in Section 6.1 of the Irrigation Scheme Risk Assessment. The updated Risk Assessment (ref. 14-K6143-ENV-R03 version 01) is attached to this response.

Q2 *Consider the risk of odour in your Landfill Irrigation Scheme Risk Assessment (ref: 14-K6143-ENV-R03 Oct 22 in Appendix D of Supporting Statement and nontechnical summary ref: 14-K6143-ENV-R05) and provide an Odour Management Plan (OMP) or justification why An OMP is not required as necessary. Please note that if an OMP is required, then you must also submit the additional fee of £1,246 for the assessment of the OMP in accordance with table 1.19.6 of the environmental permitting charging scheme.*

Sections 4 and 5 within the Risk Assessment has been updated to include an assessment of the risk of odour created by the Leachate Irrigation Scheme. Following this assessment, it was deemed unnecessary to create a standalone OMP for the following reasons:

- Airborne emissions will be low to negligible due to the near surface slow-rate release irrigation system;
- Grass surface acts as a barrier to airborne emissions;
- Higher irrigation rates at Short Rotation Coppice (SRC) Treatment Systems at other FCC sites including North Hykeham and Bootham Lane have demonstrated no odour emissions during leachate irrigation;
- The large distance of potentially sensitive receptors (>390m from the Site) from the Site, significantly reduces the risk of an atmospheric pathway; and
- No residential or office building receptors exist within 500m of the Site (only storage units within the Coronation Farm industrial estate are located within this zone).

Odour will continue to be controlled in accordance with the Site's EMS and Permit, including olfactory checks during monthly site walkovers conducted as part of the monthly monitoring undertaken during irrigation. In the event that odour is identified, the source will be investigated and where it is proven to be emanating from the landfill, remediation measures implemented will include but won't be limited to:

- Temporarily suspending irrigation;
- Checking irrigation infrastructure for potential faults/leaks;
- Checking weather data to ascertain which receptors could be at risk; and
- Conducting additional monitoring of the leachate.

Irrigation will be suspended until the source of odour is confirmed and resolved if it is found to originate from the irrigation activity.

Q3

i). *Provide further clarification on definitive area of irrigation, location of surrounding internal drains to the lagoon and associated infrastructure.*

A drawing (ref. K6143-1000 'Existing Site Layout and Area of Irrigation') has been compiled and attached to this response, detailing the proposed area of irrigation, the location of surrounding internal drains to the surface water lagoon and the proposed associated layout of irrigation infrastructure.

ii). *Provide details on the technical design of the system and pipe spacing*

Spray irrigation is to be carried out through a “leaky pipe” diffusion system which weeps a small quantity of irrigant from a porous pipe directly above the soil surface, and thereby reduces the potential for moisture loss through direct irrigation. Alternatively, a dripline system of similar capability but dripping irrigant at c.33 cm spacings. These type of systems are intended to negate direct volatilisation as a small volumetric rate seepage that does not actively cause volatilisation as a spray irrigation system would.

Irrigation is to take place inside of the 3.6ha area delineated by the surface water collection channels that surround the lower slopes of the cap. This area is limited further to 3.3ha, by only undertaking irrigation to the east of the north to south hedgerow which crosses the site, with irrigation being undertaken within a central 2.3ha area to allow for an infiltration / stand-off before the hedgerow and the surface water collection channels.

A network of irrigation pipework¹ which is rated as having approximately a 2l/hr irrigation rating will be placed within the proposed area of irrigation. The pipe work will be laid directly onto the ground surface on a nominal minimum 5m spacing within the 2.3ha central area of the site to be irrigated.

Figure 1 – Example of Leaky Pipe Water Seepage and Drip Line Irrigation



The original calculations assumed an average of 480m of irrigation pipework per hectare of the 3.6ha area which will be exposed to irrigation. However, following manufacturers advice in order to maximise direct coverage of the irrigation area, approximately 5,300m at a 5m

¹ [LeakyPipe Porous Soaker Hoses 50m-450m | Leaky Pipe Ltd Systems](#)

spacing of irrigation pipework, connected by a carrier ring main will be employed across a 2.3ha area.

Irrigation will then be limited in duration to enable the correct volume of irrigant to be applied to between 3 and 4hrs per day to deliver 35 – 46m³/day of irrigant. Irrigation will take place during the early evening to maximise infiltration.

Q4 Provide further information on the infiltration strategy to cover application rates throughout the year and under various climatic conditions.

The application is to introduce irrigation as a beneficial scheme solely during the soil moisture deficit months of the year. Therefore, the activity will only operate on a seasonal basis (May to September, unless weather conditions warrant a change of this period into April and October) to encourage and sustain vegetation cover that supports the integrity of the above capping restoration soils during the drier months and thereby prevent vegetation dieback and reduce the risk of wildfires, a key factor to be considered in climate change risk assessments.

Water availability for irrigation is limited by the Lindsay Marsh Drainage Board who provide active water management within the low-lying fenland due to low effective rainfall rates in the East of England. Consequently, there is no water available during summer periods, for “non-agricultural” irrigation requirements.

Irrigation is required as a “maintenance” application to allow vegetation growth to be continually supported and increasingly required as climate change progresses.

The Middlemarsh Irrigation Overview report ref. 14-K6143-ENV-R01 submitted as part of the permit variation application, describes that irrigation would be restricted to no more than 3mm/day² across the wider 3.6ha area. This is below the daily water need of a standard grass crop growth during the irrigation season and thus can be deliberately limited in order to prevent run-off from occurring whilst maintaining the aim of improvement to soil and vegetation cover during the driest periods of the year.

Irrigation rates of 3mm/day equate to an overall volume of 30m³ per day per hectare. Hence, over the whole landfill site this would equate to a maximum volume of 174m³ per day. Over a 90-day period from June to August this would equate to 15,660m³. However, this rate is a volume required to optimise grassland / grass crop and is therefore in excess of that required for the maintenance of the vegetative grassland sward. Irrigation volumes will in reality be significantly lower than this (at 0.6 – 1mm per day) on a continuous basis.

Irrigation rates across the entire 3.6ha area are more likely to be in the order of 2,000m³ per season (May to September) with distribution targeted towards the central 2.3ha upper slopes of the landfill in order to allow for a stand-off before the lower slope collection areas.

² Critchley. W (1991) A Manual for the Design and Construction of Water Harvesting Schemes for Plant Production accessed at <https://www.fao.org/3/u3160e/u3160e04.htm>.

This reduced irrigation rate is being used as a mitigation measure *i.e.* to improve the long-term soil condition and vegetation coverage, and therefore irrigation volumes will be determined by the health of the soil and available water supplies and is not intended to supply the higher application rates used to maximise crop growth.

The application rate has however been designed as <1mm/day over the 3.6ha central area of the site, which allows a proportion of run-off downslope outside of the central 2.3ha directly irrigated area, as well as enabling irrigation to continue uninhibited during the summer period irrespective of weather events, although if weather forecasts do predict abnormal storm events, irrigation will cease for the storm period.

Weather storms will be predicted through the regular checking of weather forecasts and irrigation stopped prior to a severe rainstorm event. Changes to the application rate will be made based on two-weekly reviews of weather conditions and will be increased temporarily up to 3mm per day for extended drought conditions.

Alternatively, if there is an exceptionally wet year and/or cool summer, irrigation rates are expected to be reduced and, in some years, there may be no need to irrigate the landfill surface to maintain soil health and a healthy vegetation cover.

Q5 Provide an updated surface water management plan with respect to increased monitoring associated with potential risks from irrigation with leachate.

A Surface Water Management Plan (SWMP) has been produced, as document K6143-ENV-R04., which describes that irrigation is to be undertaken within a ring of surface water collection channels with a significant standoff zone from the channels. The channels discharge into a lagoon, which is monitored on a monthly schedule before discharging via a monitored outfall under compliance level limitations set within Table S3.3 of the Permit.

The outfall is on the eastern flank of the site, flowing into a drainage channel which parallels the eastern perimeter of the managed by the local IDB, which is itself monitored under the site's routine monitoring programme at either end of the channel at the northeast and southeast corners of the site.

Within the SWMP it is proposed that the compliance monitoring schedule is increased from quarterly to monthly. However, it should be noted that during the irrigation season there is rarely sufficient water in the lagoon that outfalls at the discharge to enable a discharge between May and September. The collection of discharge water quality data is therefore limited, albeit there is more data for the preceding flow balancing lagoon.

This situation is expected to remain the same during irrigation, as by definition the irrigant is expected to be evaporated by evapotranspiration.

Q6 The Competence Management System certificate provided to confirm technical competence expired on 13/03/2024 – please provide an updated certificate.

A renewed Competence Management System certificate (ref. 08-LRQA-CERTIFICATE-MAR-2024) was submitted to the Environment Agency on 26th June 2024 at 17:47.

We thank you for your acknowledgement of this certificate by email on 27th June 2024.

Closure

Please do not hesitate to contact us if you require any further information in support of the enclosed documents and our responses to your queries.

Yours sincerely

For Ayesa,

Jennie Walker

Senior Consultant

jwalker@ayesa.com

01206 585 604