

SEPA monitoring assessment update for Tarbolton Landfill – October 2019



This report provides:

- A summary of current on site conditions.
- A review of environmental monitoring, including data collected from start of July to 21 October 2019.
- Information on any additional monitoring collected by SEPA to support the NHS-led Problem Assessment Group.
- An update on work to establish potential options for management of the site.

Current site conditions

SEPA has continued undertaking planned site assessment work at Tarbolton Landfill Site and has noted a general but marked deterioration in the condition of the eastern side of the landfill site in the area of leachate well (LW) 17 and LW18. This has included increased amounts of leachate and surface water and potentially hazardous gases occasionally detected within the boundary of the hazardous landfill, in the vicinity of LW17 and LW18.

The risk to the general public outwith the site has been assessed as low and this will be kept under review by the Problem Assessment Group.

However, as a result of the worsening condition of this eastern area, SEPA suspended on-site monitoring activity during September while reviewing our health and safety risk assessments for the site. We expect our on-site assessment work to recommence by November.

Environmental Risk Assessment

Media	Risk type	Previous Risk Assessment	Current Risk Assessment
Landfill gas	Migration of landfill gas through sub-surface pathways	Low	Low
Groundwater	Groundwater quality impact	Low/Moderate	Low/Moderate
Surface water	Surface water quality impact	High	High
	Impact on farm animals drinking contaminated surface water	Very Low	Very Low

SEPA have carried out intensive environmental monitoring around the Tarbolton site since May 2018 to assess the site impact on associated water bodies and wider effects. SEPA continues to review the monitoring data gathered on each sampling occasion and revise the environmental monitoring plan where necessary to inform our ongoing environmental risk assessments.

Migration of landfill gas through sub-surface pathways

The most recent sampling of landfill gas through sub-surface pathways took place in August 2019. This sampling was not undertaken in September and October while SEPA reviews its health and safety risk assessments for the site.

SEPA monitors landfill gas in perimeter boreholes to assess the risk of landfill gases migrating off site through sub-surface pathways. Methane, carbon dioxide, oxygen and other supporting parameters are monitored monthly.

Levels of carbon dioxide during July and August continued to be detected at or above permit trigger levels in perimeter gas boreholes on the southern and western perimeter of the site indicating the potential for migration of landfill gas. However, levels have remained stable month on month. Levels of methane during this period were all below the permit trigger levels. This continues to constitute a low risk to local receptors when considering the

site conditions and pathway from site to receptors. SEPA will continue monitoring the potential for landfill gas migration.

Groundwater quality

The most recent sampling of groundwater quality took place in August 2019. This sampling was not undertaken in September and October while SEPA reviews its health and safety risk assessments for the site.

SEPA monitors the level and quality of groundwater at 11 boreholes. Since March 2019, we have monitored three of these boreholes (GWD5, GWD6 and GWD7, all located close to unlined Zone 1 landfill area) approximately monthly, with the remainder of the boreholes being monitored less frequently. In addition to the groundwater monitoring, four leachate wells are sampled approximately every two months. All of these samples are analysed for a range of inorganic parameters and metals. The levels of leachate are measured at the 17 accessible wells approximately every month.

The results from the leachate wells in March, May and August 2019 are consistent with those from previous monitoring rounds and suggest that there has been little change in leachate quality in 2018-2019. Leachate levels generally display either a rising trend or are largely stable.

Groundwater levels were monitored in July and August 2019. Groundwater quality samples were collected from three boreholes (GWD5, GWD6 and GWD7) surrounding the unlined Zone 1 landfill area in July and August 2019¹.

Groundwater levels have generally been stable or have fallen slightly compared to peak levels in winter 2018-2019. Groundwater quality in boreholes GWD5 and GWD7 adjacent to the unlined Zone 1 landfill area continues to be impacted by landfill leachate. These boreholes display elevated chloride concentrations up to 1540mg/l in GWD7 and 846 mg/l in GWD5 and ammoniacal nitrogen concentrations of up to 316 mg/l in GWD7 and 82.6 mg/l in GWD5. Recent concentrations in GWD6 are considerably lower than in GWD5 and GWD7, closer to background levels.

¹ Position of the zones are shown in the maps in the main reports

It should be noted that while the leachate outbreaks are having an impact on surface water, this will constrain the leachate head and amount of infiltration of leachate through the base of the landfill. As such the risk to groundwater is not expected to significantly worsen.

The overall risk from the landfill to groundwater is considered to remain moderate from Zone 1 and low to moderate from Zone 2.

Surface water quality

SEPA monitors a range of inorganic parameters and metals at six locations on a weekly frequency on the Biggary Burn and Water of Fail. This includes an increased monitoring frequency for the site at the bottom end of the Water of Fail at Failford from monthly to weekly. The data is compared to statutory water quality standards used to classify water quality under the requirements of the Water Framework Directive (WFD)².

An initial surface water quality risk assessment based on monitoring data collected during May, June and July 2018, showed levels of contaminants that were considered to pose a moderate risk to surface water quality. This was based on the potential for the concentrations to lead to a deterioration in the water quality classification for the Water of Fail and is discussed in full in the reports available on our website³.

The risk assessment was elevated to high environmental risk in February 2019 following a series of short-term spikes in ammoniacal nitrogen concentrations over the winter period. The risk remained high during Spring 2019 as the surface water impacts remained significant.

The evidence gathered during our intensive monitoring programme demonstrates the watercourses around Tarbolton Landfill are heavily influenced by local rainfall patterns and resulting flow, therefore chemical concentrations fluctuate depending on available dilution.

² [The Scotland River Basin District \(Standards\) Directions 2014](#)
[The Scotland River Basin District \(Standards\) Amendment Directions 2015](#)

³ [Tarbolton Landfill – Report Investigation into the potential for environmental impacts resulting from the consolidated ash waste deposition and lack of operational management](#)
[Tarbolton Landfill – Report Monitoring plan and update of potential for environmental impacts resulting from consolidated ash waste deposition and lack of operational management](#)

Following a dry Spring, local rainfall in July and August was well above monthly average, with rainfall levels closer to the average in September. This added to the dilution available in the watercourses leading to lower concentrations of ammoniacal nitrogen in the Biggary Burn and Water of Fail. Although the environmental impact in recent months was still significant, measured concentrations were in the range 1-20 mg/l in the Water of Fail between July and September. The lower concentrations in this range coincided with periods of increased flow. These values would lead to a classification of bad under the relevant WFD standard for ammoniacal nitrogen.

The monitoring point 5.5 km downstream at Failford has seen highly variable ammoniacal nitrogen concentrations in July and August between 0.6 and 6.6 mg/l. During September, the concentrations have been more stable falling in the range 0.6 to 2.4 mg/l.

Concentrations of manganese were above the Environmental Quality Standard (EQS) in the Biggary burn and downstream locations in the Water of Fail. However, monitoring data at locations upstream of the landfill show concentrations of manganese in the region of 50% of the EQS. Monitoring of dissolved chromium shows concentrations above the EQS in the Biggary burn.

The overall risk assessment for surface water quality remains at high.

Farm animals

In the Biggary burn, in particular, there is significant contamination of the watercourse as discussed above. However, the burn is steep and fenced in this area and as such should be inaccessible to livestock. In addition, under the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended), General Binding Rule (GBR) 19 on the keeping of livestock states that poaching of any land within 5m of any river, burn or ditch must be prevented⁴. SEPA have had discussions over meeting the requirements of the GBR with farmers in the local area.

The current risk assessment remains at very low.

⁴ [The water Environment \(controlled Activities\) \(Scotland\) Regulations 2011- A practical guide](#)

Odours and information to support public health risks

A low volume of complaints were received in July. This has increased steadily across August and September associated with the odour at Tarbolton Landfill. SEPA Officers continue to undertake regular odour assessments at the landfill. A strong and unpleasant odour was recorded by SEPA on 21 August. The source of this odour is believed to be from a leachate outbreak along the eastern boundary of the site. Odours on the site are strong, as per previous updates. The main source of odours are from leachate outbreaks and the uncapped areas of the site.

A cross agency Problem Assessment Group (PAG) was established by NHS Ayrshire & Arran to enable the NHS to assess risks to public health. In addition to the NHS, the members of this group are: South Ayrshire Council, SEPA, Health Protection Scotland, Health and Safety Executive and Scottish Water. SEPA updates the PAG on odour assessments and environmental monitoring.

Following discussions with the PAG, SEPA commissioned further sampling to establish the concentration of trace components in the raw landfill gas and in the air in areas immediately overlying open leachate overflows and an open leachate well. The monitoring investigation focussed on six locations within the boundary of Tarbolton Landfill, three in-waste gas wells, two areas immediately overlying leachate overflows and one immediately overlying an open leachate well.

The sampling took place at the start of April, with analysis results received by SEPA on 30 April 2019 from the contractor. This information was shared with the PAG to inform discussions on whether additional monitoring was needed to further inform the public health risk assessment. These discussions are continuing.

The PAG met on 10 Sep 2019 and considered results of ongoing monitoring and sampling at the landfill site by SEPA. This monitoring has confirmed that potentially hazardous gases have been occasionally detected within the boundary of the unmanaged landfill site. In response to the detection of gases and the risk of deep water at the site, on behalf of all members of the problem assessment group, South Ayrshire Council has erected signage warning members of the public to keep off the site.

Several agencies are undertaking investigations to understand this complex situation. The risk to the general public outwith the site has been assessed as low and this will be kept under review by the Problem Assessment Group.

We would urge members of the public to keep off the unmanaged landfill site. Anyone experiencing symptoms that they think are related to the landfill should seek medical advice from their GP in the first instance.

Work to establish potential options for management of the site

SEPA have been in regular contact with Scottish Government in relation to Tarbolton landfill site. Earlier this year, Scottish Government asked SEPA to commission a report into options for the management of the site which would mitigate the impact on the environment.

As a result of this work it has become clear that, in order to arrive at accurate costed options for managing the site, further survey work will be required. Scottish Government has confirmed that it will fund this additional work. However due to the current condition of the site it has become apparent that access to specific area's which require entry for the purpose of the survey work is not possible at this time. SEPA is in dialogue with the relevant parties to ensure full access of the site to safely undertake the survey work. Once we have the results of this survey work we intend to discuss further with Scottish Government.

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