



ANNEX F6

INVESTIGATION REPORTS OF  
ENVIRONMENTAL QUALITY LIMIT  
EXCEEDANCE

## Investigation Report of Environmental Quality Limit Exceedance

Project	South East New Territories (SENT) Landfill Extension
Date	7 March 2023
Time	14:51
Monitoring Location	MWX-6
Parameter	Chemical Oxygen Demand (COD)
Limit Levels	>46 mg /L
Measured Level	48 mg /L
Possible reason	<p>Groundwater contaminated with leachate is commonly characterized by high COD and ammoniacal-nitrogen levels as a result of degradation of organic matters in the waste. The ammoniacal-nitrogen monitoring result at groundwater monitoring well MWX-6 (4.23 mg/L) and the COD monitoring results of the groundwater monitoring wells adjacent to MWX-6 (MWX-5: 30 mg/L and MWX-7: 30 mg/L) are well within the respective limit levels. Hence, there is a low possibility of the elevation of COD level at MWX-6 is due to leachate contamination from SENTX operation or at least it is not conclusive to base on these results to demonstrate exceedance was due to leachate contamination.</p> <p>In accordance with Table 4.5b of the updated EM&amp;A Manual, repeat measurement was conducted on 13 April 2023 to confirm findings. Exceedance of COD Limit Level was recorded at MWX-6 (54 mg/L) during the sampling event. MWX-6 showed consecutive exceedance of the groundwater quality limit.</p> <p>According to the findings of the desktop review commissioned by GVL and EPD (the Employer) in May 2021 to investigate the potential sources of the elevated methane levels at the perimeter landfill gas monitoring wells at SENTX, pockets of organic matters are identified in the fill materials of the SENTX site upon review of the historical site investigation borehole logs at the Project Site area. It is possible that the elevated COD concentration measured at MWX-6 (with detection of elevated levels of methane (up to 12.2% v/v) and in close proximity to LFG13, which shows elevated methane levels continuously) on 7 March 2023 could be due to localised organic matters within or around the monitoring wells and background fluctuation.</p> <p>Due to the presence of influencing factor from non-project source and the COD levels at all other groundwater monitoring wells are within the respective limit level, there is no adequate evidence showing that the COD level exceedance measured at MWX-6 on 7 March 2023 was deemed to Project-related activities.</p> <p>It should also be noted that although the COD level exceeded the</p>

	<p>limit level of the EM&amp;A programme, it is still well within the WPCO effluent discharge limit of COD (80 mg/L) and the standard for effluents discharged into the inshore waters of the Junk Bay Water Control Zone as stipulated under Technical Memorandum Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (80 mg/L). The slight exceedance of COD at MWX-6 on 7 March 2023 will not cause adverse water quality impact to the Junk Bay Water Control Zone.</p>
Action Taken / Action to be Taken	<p>Examination of environmental performance of the Project will be continued during the weekly inspections. The Contractor is reminded to implement relevant and appropriate mitigation measures according to the updated EM&amp;A Manual to avoid any exceedance of the Action and Limit Levels.</p> <p>ET will continue to closely monitor the groundwater quality monitoring results and collect additional data for investigation and further review, if necessary.</p>
Remarks	-

Prepared by: Abbey Lau  
Designation: Environmental Team  
Date: 28 April 2023

## Investigation Report of Environmental Quality Limit Exceedance

Project	South East New Territories (SENT) Landfill Extension
Date	13 April 2023
Time	11:49
Monitoring Location	MWX-6
Parameter	Chemical Oxygen Demand (COD)
Limit Levels	>46 mg /L
Measured Level	54 mg /L
Possible reason	<p>Groundwater contaminated with leachate is commonly characterized by high COD and ammoniacal-nitrogen levels as a result of degradation of organic matters in the waste. The ammoniacal-nitrogen monitoring result at groundwater monitoring well MWX-6 (3.74 mg/L) and the COD monitoring results of the groundwater monitoring wells adjacent to MWX-6 (MWX-5: 27 mg/L and MWX-7: 27 mg/L) are well within the respective limit levels. Hence, there is a low possibility of the elevation of COD level at MWX-6 is due to leachate contamination from SENTX operation or at least it is not conclusive to base on these results to demonstrate exceedance was due to leachate contamination.</p> <p>In accordance with Table 4.5b of the updated EM&amp;A Manual, repeat measurement was conducted on 4 May 2023 to confirm findings. COD concentration of 36 mg/L (below the Limit Level) was measured at MWX-6 during the sampling event, which demonstrate no consecutive groundwater quality impact at the monitoring location.</p> <p>According to the findings of the desktop review commissioned by GVL and EPD (the Employer) in May 2021 to investigate the potential sources of the elevated methane levels at the perimeter landfill gas monitoring wells at SENTX, pockets of organic matters are identified in the fill materials of the SENTX site upon review of the historical site investigation borehole logs at the Project Site area. It is possible that the elevated COD concentration measured at MWX-6 (with detection of elevated levels of methane (up to 12.2% v/v) and in close proximity to LFG13, which shows elevated methane levels continuously) on 13 April 2023 could be due to localised organic matters within or around the monitoring wells and background fluctuation.</p> <p>Due to the presence of influencing factor from non-project source and the subsequent month monitoring results at MWX-6 did not show any exceedance, there is no adequate evidence showing that the COD level exceedance measured at MWX-6 on 13 April 2023 was deemed to Project-related activities.</p>

	<p>It should also be noted that although the COD level exceeded the limit level of the EM&amp;A programme, it is still well within the WPCO effluent discharge limit of COD (80 mg/L) and the standard for effluents discharged into the inshore waters of the Junk Bay Water Control Zone as stipulated under Technical Memorandum Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (80 mg/L). The slight exceedance of COD at MWX-6 on 13 April 2023 will not cause adverse water quality impact to the Junk Bay Water Control Zone.</p>
Action Taken / Action to be Taken	<p>Examination of environmental performance of the Project will be continued during the weekly inspections. The Contractor is reminded to implement relevant and appropriate mitigation measures according to the updated EM&amp;A Manual to avoid any exceedance of the Action and Limit Levels.</p> <p>ET will continue to closely monitor the groundwater quality monitoring results and collect additional data for investigation and further review, if necessary.</p>
Remarks	-

Prepared by: Abbey Lau  
Designation: Environmental Team  
Date: 22 May 2023

## Investigation Report of Environmental Quality Limit Exceedance

Project	South East New Territories (SENT) Landfill Extension
Date	4 May 2023
Time	MWX-5: 11:16 MWX-8: 10:32
Monitoring Location	MWX-5, MWX-8
Parameter	Chemical Oxygen Demand (COD)
Limit Levels	MWX-5: >30 mg /L MWX-8: >50 mg /L
Measured Level	MWX-5: 38 mg /L MWX-8: 70 mg /L
Possible reason	<p>Groundwater contaminated with leachate is commonly characterized by high COD and ammoniacal-nitrogen levels as a result of degradation of organic matters in the waste. The ammoniacal-nitrogen monitoring result at groundwater monitoring wells MWX-5 (2.44 mg/L) and MWX-8 (8.63 mg/L), and the COD monitoring results of the groundwater monitoring wells adjacent to MWX-5 (MWX-4: 29 mg/L and MWX-6: 36 mg/L) and MWX-8 (MWX-7: 29 mg/L and MWX-9: 6 mg/L) are well within the respective limit levels. Hence, there is a low possibility of the elevation of COD level at MWX-5 and MWX-8 is due to leachate contamination from SENTX operation or at least it is not conclusive to base on these results to demonstrate exceedance was due to leachate contamination.</p> <p>In accordance with Table 4.5b of the updated EM&amp;A Manual, repeat measurement was conducted on 8 June 2023 to confirm findings. COD concentration of 26 mg/L and 36 mg/L (below the Limit Level) was measured at MWX-5 and MWX-8, respectively during the sampling event, which demonstrate no consecutive groundwater quality impact at the monitoring locations.</p> <p>According to the findings of the desktop review commissioned by GVL and EPD (the Employer) in May 2021 to investigate the potential sources of the elevated methane levels at the perimeter landfill gas monitoring wells at SENTX, pockets of organic matters are identified in the fill materials of the SENTX site upon review of the historical site investigation borehole logs at the Project Site area. It is possible that the elevated COD concentration measured at MWX-5 and MWX-8 on 4 May 2023 could be due to localised organic matters within or around the monitoring wells and background fluctuation.</p> <p>Due to the presence of influencing factor from non-project source and the subsequent month monitoring results at MWX-5 and MWX-8 did not show any exceedance, there is no adequate</p>

	<p>evidence showing that the COD level exceedances measured at MWX-5 and MWX-8 on 4 May 2023 were deemed to Project-related activities.</p> <p>It should also be noted that although the COD level exceeded the limit level of the EM&amp;A programme, it is still well within the WPCO effluent discharge limit of COD (80 mg/L) and the standard for effluents discharged into the inshore waters of the Junk Bay Water Control Zone as stipulated under Technical Memorandum Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (80 mg/L). The slight exceedance of COD at MWX-5 and MWX-8 on 4 May 2023 will not cause adverse water quality impact to the Junk Bay Water Control Zone.</p>
Action Taken / Action to be Taken	<p>Examination of environmental performance of the Project will be continued during the weekly inspections. The Contractor is reminded to implement relevant and appropriate mitigation measures according to the updated EM&amp;A Manual to avoid any exceedance of the Action and Limit Levels.</p> <p>ET will continue to closely monitor the groundwater quality monitoring results and collect additional data for investigation and further review, if necessary.</p>
Remarks	-

Prepared by: Abbey Lau

Designation: Environmental Team

Date: 29 June 2023

## Investigation Report of Environmental Quality Limit Exceedance

Project	South East New Territories (SENT) Landfill Extension
Date	17 - 22 June 2023
Monitoring Location	Pump Station No. 4X (Cell 4X)
Parameter	Leachate level
Limit Levels	> 186 cm
Measured Level	<u>Pump Station No. 4X (Average of Meter No. X-7 and No. X-8)</u> 17 June 2023: 234 cm 18 June 2023: 279 cm 19 June 2023: 299 cm 20 June 2023: 287 cm 21 June 2023: 260 cm 22 June 2023: 216 cm
Possible reason	<p>From the on-site rainfall record of June 2023, heavy rainfall events (up to 90 mm per day) were recorded from 17 to 22 June 2023. Amber and red rainstorm warning signals were also issued by the Hong Kong Observatory on 17 and 18 June 2023. As confirmed by the Contractor, the leachate collection system and leachate treatment plant were under normal operating conditions during the reporting period.</p> <p>Accumulation of surface water at Cell 4X was observed during the reporting period, which could contribute to the leachate level exceedances. Based on this observation, the leachate level exceedances at Pump Station No. 4X were deemed to Project-related activities.</p> <p>It is understood that the large volume of leachate (contaminated surface runoff) accumulated at Cell 4X has exceeded the leachate treatment capacity (daily maximum effluent discharge volume of 1,633 m<sup>3</sup> recorded from 17 to 22 June 2023, with daily effluent discharge limit of 2,000 m<sup>3</sup> as stipulated in the WPCO license).</p>
Action Taken / Action to be Taken	Examination of environmental performance of the Project will be continued during the weekly inspections. The Contractor is reminded to closely monitor the operating conditions of the leachate collection system (e.g. set alarm when the leachate level reach about 80% of the Limit Level) and pump out the leachate for treatment to avoid any exceedance of the Limit Level.
Remarks	-

Prepared by: Abbey Lau  
Designation: Environmental Team  
Date: 29 June 2023



## Investigation Report of Environmental Quality Limit Exceedance

Project	South East New Territories (SENT) Landfill Extension
Date	11 July 2023
Time	11:35
Monitoring Location	MWX-7
Parameter	Chemical Oxygen Demand (COD)
Limit Levels	>36 mg /L
Measured Level	41 mg /L
Possible reason	<p>Groundwater contaminated with leachate is commonly characterized by high COD and ammoniacal-nitrogen levels as a result of degradation of organic matters in the waste. The ammoniacal-nitrogen monitoring result at groundwater monitoring wells MWX-7 (5.16 mg/L) and the COD monitoring results of the groundwater monitoring wells adjacent to MWX-7 (MWX-6: 43 mg/L and MWX-8: 32 mg/L) are well within the respective limit levels. Hence, there is a low possibility of the elevation of COD level at MWX-7 is due to leachate contamination from SENTX operation or at least it is not conclusive to base on these results to demonstrate exceedance was due to leachate contamination.</p> <p>In accordance with Table 4.5b of the updated EM&amp;A Manual, repeat measurement was conducted on 2 August 2023 to confirm findings. COD concentration of 28 mg/L (below the Limit Level) was measured at MWX-7 during the sampling event, which demonstrate no consecutive groundwater quality impact at the monitoring location.</p> <p>According to the findings of the desktop review commissioned by GVL and EPD (the Employer) in May 2021 to investigate the potential sources of the elevated methane levels at the perimeter landfill gas monitoring wells at SENTX, pockets of organic matters are identified in the fill materials of the SENTX site upon review of the historical site investigation borehole logs at the Project Site area. It is possible that the elevated COD concentration measured at MWX-7 on 11 July 2023 could be due to localised organic matters within or around the monitoring well and background fluctuation.</p> <p>Due to the presence of influencing factor from non-project source and the subsequent month monitoring results at MWX-7 did not show any exceedance, there is no adequate evidence showing that the COD level exceedance measured at MWX-7 on 11 July 2023 was deemed to Project-related activities.</p> <p>It should also be noted that although the COD level exceeded the limit level of the EM&amp;A programme, it is still well within the WPCO effluent discharge limit of COD (80 mg/L) and the standard</p>

	for effluents discharged into the inshore waters of the Junk Bay Water Control Zone as stipulated under Technical Memorandum Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (80 mg/L). The slight exceedance of COD at MWX-7 on 11 July 2023 will not cause adverse water quality impact to the Junk Bay Water Control Zone.
Action Taken / Action to be Taken	<p>Examination of environmental performance of the Project will be continued during the weekly inspections. The Contractor is reminded to implement relevant and appropriate mitigation measures according to the updated EM&amp;A Manual to avoid any exceedance of the Action and Limit Levels.</p> <p>ET will continue to closely monitor the groundwater quality monitoring results and collect additional data for investigation and further review, if necessary.</p>
Remarks	-

Prepared by: Abbey Lau  
 Designation: Environmental Team  
 Date: 28 August 2023

## Investigation Report of Environmental Quality Limit Exceedance

Project	South East New Territories (SENT) Landfill Extension
Date	2 August 2023
Time	16:03
Monitoring Location	MWX-6
Parameter	Chemical Oxygen Demand (COD)
Limit Level	>46 mg /L
Measured Level	49 mg /L
Possible reason	<p>Groundwater contaminated with leachate is commonly characterized by high COD and ammoniacal-nitrogen levels as a result of degradation of organic matters in the waste. The ammoniacal-nitrogen monitoring result at groundwater monitoring wells MWX-6 (4.32 mg/L) and the COD monitoring results of the groundwater monitoring wells adjacent to MWX-6 (MWX-5: 24 mg/L and MWX-7: 28 mg/L) are well within the respective limit levels. Hence, there is a low possibility of the elevation of COD level at MWX-6 is due to leachate contamination from SENTX operation or at least it is not conclusive to base on these results to demonstrate exceedance was due to leachate contamination.</p> <p>In accordance with Table 4.5b of the updated EM&amp;A Manual, repeat measurement was conducted on 22 September 2023 to confirm findings. COD concentration of 36 mg/L (below the Limit Level) was measured at MWX-6 during the sampling event, which demonstrate no consecutive groundwater quality impact at the monitoring location.</p> <p>According to the findings of the desktop review commissioned by GVL and EPD (the Employer) in May 2021 to investigate the potential sources of the elevated methane levels at the perimeter landfill gas monitoring wells at SENTX, pockets of organic matters are identified in the fill materials of the SENTX site upon review of the historical site investigation borehole logs at the Project Site area. It is possible that the elevated COD concentration measured at MWX-6 on 2 August 2023 could be due to localised organic matters within or around the monitoring well and background fluctuation.</p> <p>Due to the presence of influencing factor from non-project source and the subsequent month monitoring results at MWX-6 did not show any exceedance, there is no adequate evidence showing that the COD level exceedance measured at MWX-6 on 2 August 2023 was deemed to Project-related activities.</p> <p>It should also be noted that although the COD level exceeded the limit level of the EM&amp;A programme, it is still well within the</p>

	<p>WPCO effluent discharge limit of COD (80 mg/L) and the standard for effluents discharged into the inshore waters of the Junk Bay Water Control Zone as stipulated under Technical Memorandum Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (80 mg/L). The slight exceedance of COD at MWX-6 on 2 August 2023 will not cause adverse water quality impact to the Junk Bay Water Control Zone.</p>
Action Taken / Action to be Taken	<p>Examination of environmental performance of the Project will be continued during the weekly inspections. The Contractor is reminded to implement relevant and appropriate mitigation measures according to the updated EM&amp;A Manual to avoid any exceedance of the Action and Limit Levels.</p> <p>ET will continue to closely monitor the groundwater quality monitoring results and collect additional data for investigation and further review, if necessary.</p>
Remarks	-

Prepared by: Abbey Lau  
 Designation: Environmental Team  
 Date: 9 October 2023

## Investigation Report of Environmental Quality Limit Exceedance

Project	South East New Territories (SENT) Landfill Extension
Date	4 August 2023
Time	14:17 and 14:25 (Duplicate)
Monitoring Location	DP4
Parameter	Surface Water (Suspended Solids (SS))
Limit Level	>20 mg/L
Measured Level	DP4: 57.4 mg /L DP4 (Duplicate): 46.3 mg /L
Possible reason	<p>From the on-site rainfall record of July and August 2023, heavy rainfall events were recorded on 28 to 31 July and 4 August 2023 before the sampling event. Red and amber rainstorm warning signal were also issued by the Hong Kong Observatory on 29 and 31 August 2023, respectively.</p> <p>No works which may lead to potential SS increase (e.g. active stockpiling and excavation works) was conducted in the vicinity of surface water channel leading to DP4 on the sampling day based on on-site observations and construction activities described by the Contractor.</p> <p>During the sampling event, no raining was recorded and no other sources (e.g. other project sites) was identified in the vicinity of surface water channel leading to DP4 which might cause the SS exceedance at DP4. Site surface runoff at DP4 channel was treated by the Wetsep prior to discharge. The contaminated runoff from the unpaved areas during the previous rainfall events could also be the potential source of SS contributing to the exceedance. The SS exceedance at DP4 was therefore deemed to Project-related activities.</p> <p>In accordance with Table 4.5b of the updated EM&amp;A Manual, repeat measurement was conducted on 15 August 2023 to confirm findings. Surface water samples with SS concentration of 12.2 mg/L and 12.6 mg/L (below the Limit Level) were sampled at DP4, which demonstrate no consecutive surface water quality impact at the monitoring location.</p>
Action Taken / Action to be Taken	<p>In accordance with Table 4.5b of the updated EM&amp;A Manual, the monitoring frequency shall be increased to weekly until no exceedance of Limit Level. It should be noted that the turnaround time for the laboratory analysis of the surface water sample is 5 working days and the preliminary results for the monitoring event conducted on 4 August 2023 were available on 14 August 2023. Repeat measurement was conducted on 15 August 2023, and the SS results at DP4 are well below the Limit Level. Hence, the weekly</p>

	<p>surface water monitoring at DP4 shall not be triggered.</p> <p>Examination of environmental performance of the Project will be continued during the weekly inspections. The Contractor is reminded to implement relevant and appropriate mitigation measures according to the updated EM&amp;A Manual to avoid any exceedance of the Action and Limit Levels.</p> <p>In addition, the Contractor shall review the efficiency of the Wetsep near sediment trap and monitor the Wetsep operation regularly to ensure it is functioning properly at all times.</p>
Remarks	-

Prepared by: Abbey Lau  
Designation: Environmental Team  
Date: 28 August 2023

## Investigation Report of Environmental Quality Limit Exceedance

Project	South East New Territories (SENT) Landfill Extension
Date	Pump Station No. 1X: 8 - 16 September 2023 Pump Station No. 3X: 8 - 20 September 2023 Pump Station No. 4X: 8 - 20 September 2023
Monitoring Location	Pump Station No. 1X (Cell 1X), Pump Station No. 3X (Cell 3X) and Pump Station No. 4X (Cell 4X)
Parameter	Leachate level
Limit Levels	Pump Station No. 1X: > 178 cm Pump Station No. 3X: > 175 cm Pump Station No. 4X: > 186 cm
Measured Level	<p><u>Pump Station No. 1X (Average of Meter No. X-1 and No. X-2)</u></p> <p>8 September 2023: 243 cm 9 September 2023: 235 cm 10 September 2023: 231 cm 11 September 2023: 228 cm 12 September 2023: 222 cm 13 September 2023: 218 cm 14 September 2023: 204 cm 15 September 2023: 186 cm 16 September 2023: 175 cm</p> <p><u>Pump Station No. 3X (Average of Meter No. X-5 and No. X-6)</u></p> <p>8 September 2023: 194 cm 9 September 2023: 194 cm 10 September 2023: 211 cm 11 September 2023: 210 cm 12 September 2023: 213 cm 13 September 2023: 218 cm 14 September 2023: 218 cm 15 September 2023: 216 cm 16 September 2023: 218 cm 17 September 2023: 214 cm 18 September 2023: 209 cm 19 September 2023: 203 cm 20 September 2023: 192 cm</p> <p><u>Pump Station No. 4X (Average of Meter No. X-7 and No. X-8)</u></p> <p>8 September 2023: 250 cm 9 September 2023: 272 cm 10 September 2023: 278 cm</p>

	<p>11 September 2023: 283 cm  12 September 2023: 279 cm  13 September 2023: 274 cm  14 September 2023: 273 cm  15 September 2023: 268 cm  16 September 2023: 263 cm  17 September 2023: 270 cm  18 September 2023: 262 cm  19 September 2023: 242 cm  20 September 2023: 206 cm</p>
Possible reason	<p>From the on-site rainfall record of September 2023, heavy rainfall events (up to 356 mm per day) were recorded from 7 to 15 September 2023. Amber, red and black rainstorm warning signals were also issued by the Hong Kong Observatory on 7, 8, 10, 14 and 15 September 2023. As confirmed by the Contractor, the leachate collection system and leachate treatment plant were under normal operating conditions during the reporting period.</p> <p>Accumulation of surface water at Cell 1X, 3X and 4X was observed during the reporting period, which could contribute to the leachate level exceedances. Based on this observation, the leachate level exceedances at Pump Station No. 1X, 3X and 4X were deemed to Project-related activities.</p> <p>It is understood that the large volume of leachate (contaminated surface runoff) accumulated at Cell 1X, 3X and 4X has exceeded the leachate treatment capacity (daily maximum effluent discharge volume of 1,783 m<sup>3</sup> recorded from 8 to 20 September 2023, with daily effluent discharge limit of 2,000 m<sup>3</sup> as stipulated in the WPCO license).</p>
Action Taken / Action to be Taken	<p>Examination of environmental performance of the Project will be continued during the weekly inspections. The Contractor is reminded to closely monitor the operating conditions of the leachate collection system (e.g. set alarm when the leachate level reach about 80% of the Limit Level) and pump out the leachate for treatment to avoid any exceedance of the Limit Level.</p>
Remarks	-

Prepared by: Abbey Lau  
Designation: Environmental Team  
Date: 9 October 2023



## Investigation Report of Environmental Quality Limit Exceedance

Project	South East New Territories (SENT) Landfill Extension
Date	22 September 2023
Time	11:32
Monitoring Location	MWX-7
Parameter	Chemical Oxygen Demand (COD)
Limit Level	>36 mg /L
Measured Level	40 mg /L
Possible reason	<p>Groundwater contaminated with leachate is commonly characterized by high COD and ammoniacal-nitrogen levels as a result of degradation of organic matters in the waste. The ammoniacal-nitrogen monitoring result at groundwater monitoring wells MWX-7 (4.80 mg/L) and the COD monitoring results of the groundwater monitoring wells adjacent to MWX-7 (MWX-6: 36 mg/L and MWX-8: 32 mg/L) are well within the respective limit levels. Hence, there is a low possibility of the elevation of COD level at MWX-7 is due to leachate contamination from SENTX operation or at least it is not conclusive to base on these results to demonstrate exceedance was due to leachate contamination.</p> <p>In accordance with Table 4.5b of the updated EM&amp;A Manual, repeat measurement was conducted on 12 October 2023 to confirm findings. COD concentration of 31 mg/L (below the Limit Level) was measured at MWX-7 during the sampling event, which demonstrate no consecutive groundwater quality impact at the monitoring location.</p> <p>According to the findings of the desktop review commissioned by GVL and EPD (the Employer) in May 2021 to investigate the potential sources of the elevated methane levels at the perimeter landfill gas monitoring wells at SENTX, pockets of organic matters are identified in the fill materials of the SENTX site upon review of the historical site investigation borehole logs at the Project Site area. It is possible that the elevated COD concentration measured at MWX-7 on 22 September 2023 could be due to localised organic matters within or around the monitoring well and background fluctuation.</p> <p>Due to the presence of influencing factor from non-project source and the subsequent month monitoring results at MWX-7 did not show any exceedance, there is no adequate evidence showing that the COD level exceedance measured at MWX-7 on 22 September 2023 was deemed to Project-related activities.</p> <p>It should also be noted that although the COD level exceeded the limit level of the EM&amp;A programme, it is still well within the</p>

	<p>WPCO effluent discharge limit of COD (80 mg/L) and the standard for effluents discharged into the inshore waters of the Junk Bay Water Control Zone as stipulated under Technical Memorandum Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (80 mg/L). The slight exceedance of COD at MWX-7 on 22 September 2023 will not cause adverse water quality impact to the Junk Bay Water Control Zone.</p>
Action Taken / Action to be Taken	<p>Examination of environmental performance of the Project will be continued during the weekly inspections. The Contractor is reminded to implement relevant and appropriate mitigation measures according to the updated EM&amp;A Manual to avoid any exceedance of the Action and Limit Levels.</p> <p>ET will continue to closely monitor the groundwater quality monitoring results and collect additional data for investigation and further review, if necessary.</p>
Remarks	-

Prepared by: Abbey Lau  
 Designation: Environmental Team  
 Date: 7 November 2023

## Investigation Report of Environmental Quality Limit Exceedance

Project	South East New Territories (SENT) Landfill Extension
Date	Pump Station No. 1X: 9 – 17 October 2023 Pump Station No. 2X: 11 October 2023 – 23 November 2023 Pump Station No. 3X: 9 October 2023 – 24 November 2023 Pump Station No. 4X: 9 October 2023 – 14 November 2023
Monitoring Location	Pump Station No. 1X (Cell 1X), Pump Station No. 2X (Cell 2X), Pump Station No. 3X (Cell 3X) and Pump Station No. 4X (Cell 4X)
Parameter	Leachate level
Limit Levels	Pump Station No. 1X: > 178 cm Pump Station No. 2X: > 180 cm Pump Station No. 3X: > 175 cm Pump Station No. 4X: > 186 cm
Measured Level	<p><u>Pump Station No. 1X (Meter No. X-1*)</u></p> <p>9 October 2023: 231 cm 10 October 2023: 233 cm 11 October 2023: 224 cm 12 October 2023: 244 cm 13 October 2023: 251 cm 14 October 2023: 240 cm 15 October 2023: 224 cm 16 October 2023: 208 cm 17 October 2023: 188 cm</p> <p><u>Pump Station No. 2X (Average of Meter No. X-3 and No. X-4)</u></p> <p>11 October 2023: 284 cm 12 October 2023: 336 cm 13 October 2023: 332 cm 14 October 2023: 323 cm 15 October 2023: 314 cm 16 October 2023: 303 cm 17 October 2023: 298 cm 18 October 2023: 290 cm 19 October 2023: 278 cm 20 October 2023: 288 cm 21 October 2023: 289 cm 22 October 2023: 279 cm 23 October 2023: 278 cm 24 October 2023: 282 cm 25 October 2023: 297 cm 26 October 2023: 316 cm</p>

	<p>27 October 2023: 320 cm  28 October 2023: 316 cm  29 October 2023: 316 cm  30 October 2023: 319 cm  31 October 2023: 319 cm  1 November 2023: 320 cm  2 November 2023: 320 cm  3 November 2023: 319 cm  4 November 2023: 317 cm  5 November 2023: 316 cm  6 November 2023: 311 cm  7 November 2023: 315 cm  8 November 2023: 315 cm  9 November 2023: 315 cm  10 November 2023: 315 cm  11 November 2023: 315 cm  12 November 2023: 315 cm  13 November 2023: 315 cm  14 November 2023: 315 cm  15 November 2023: 315 cm  16 November 2023: 303 cm  17 November 2023: 289 cm  18 November 2023: 276 cm  19 November 2023: 263 cm  20 November 2023: 248 cm  21 November 2023: 253 cm  22 November 2023: 194 cm  23 November 2023: 154 cm (Please note that the leachate level recorded at Meter No. X-3 for Pump Station No. 2X on 23 November 2023 was 209 cm, which exceeded the Limit Level.)</p> <p><u>Pump Station No. 3X (Average of Meter No. X-5 and No. X-6*)</u></p> <p>9 October 2023: 211 cm  10 October 2023: 358 cm  11 October 2023: 366 cm  12 October 2023: 364 cm  13 October 2023: 358 cm  14 October 2023: 353 cm  15 October 2023: 346 cm  16 October 2023: 338 cm  17 October 2023: 331 cm</p>
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18 October 2023: 324 cm  
19 October 2023: 324 cm  
20 October 2023: 335 cm  
21 October 2023: 335 cm  
22 October 2023: 338 cm  
23 October 2023: 342 cm  
24 October 2023: 344 cm  
25 October 2023: 344 cm  
26 October 2023: 346 cm  
27 October 2023: 349 cm  
28 October 2023: 346 cm  
29 October 2023: 345 cm  
30 October 2023: 349 cm  
31 October 2023: 349 cm  
1 November 2023: 349 cm  
2 November 2023: 351 cm  
3 November 2023: 346 cm  
4 November 2023: 340 cm  
5 November 2023: 340 cm  
6 November 2023: 338 cm  
7 November 2023: 338 cm  
8 November 2023: 338 cm  
9 November 2023: 338 cm  
10 November 2023: 338 cm  
11 November 2023: 338 cm  
12 November 2023: 340 cm  
13 November 2023: 340 cm  
14 November 2023: 340 cm  
15 November 2023: 336 cm  
16 November 2023: 307 cm  
17 November 2023: 297 cm  
18 November 2023: 283 cm  
19 November 2023: 268 cm  
20 November 2023: 254 cm  
21 November 2023: 239 cm  
22 November 2023: 223 cm  
23 November 2023: 207 cm  
24 November 2023: 189 cm

Pump Station No. 4X (Average of Meter No. X-7 and No. X-8)

9 October 2023: 312 cm

10 October 2023: 411 cm  
11 October 2023: 384 cm  
12 October 2023: 369 cm  
13 October 2023: 358 cm  
14 October 2023: 353 cm  
15 October 2023: 346 cm  
16 October 2023: 338 cm  
17 October 2023: 327 cm  
18 October 2023: 355 cm  
19 October 2023: 358 cm  
20 October 2023: 359 cm  
21 October 2023: 360 cm  
22 October 2023: 361 cm  
23 October 2023: 362 cm  
24 October 2023: 365 cm  
25 October 2023: 364 cm  
26 October 2023: 366 cm  
27 October 2023: 368 cm  
28 October 2023: 365 cm  
29 October 2023: 365 cm  
30 October 2023: 367 cm  
31 October 2023: 367 cm  
1 November 2023: 375 cm  
2 November 2023: 375 cm  
3 November 2023: 364 cm  
4 November 2023: 358 cm  
5 November 2023: 349 cm  
6 November 2023: 338 cm  
7 November 2023: 340 cm  
8 November 2023: 325 cm  
9 November 2023: 311 cm  
10 November 2023: 296 cm  
11 November 2023: 281 cm  
12 November 2023: 259 cm  
13 November 2023: 234 cm  
14 November 2023: 199 cm

(\*Meter No. X-2 for Pump Station No. 1X and Meter No. X-5 for Pump Station No. 3X are on standby from 9 October 2023 to 14 November 2023.)

Possible reason	<p>From the on-site rainfall record of October and November 2023, heavy rainfall events (up to 210 mm per day) were recorded from 9 October to 24 November 2023. Amber, red and black rainstorm warning signals were also issued by the Hong Kong Observatory on 8 and 9 October 2023. As confirmed by the Contractor, the leachate collection system and leachate treatment plant were under normal operating conditions and routine maintenance during the reporting period.</p> <p>Accumulation of surface water at Cell 1X, 2X, 3X and 4X was observed during the reporting period, which could contribute to the leachate level exceedances. Based on this observation, the leachate level exceedances at Pump Station No. 1X, 2X, 3X and 4X were deemed to Project-related activities.</p> <p>It is understood that the large volume of leachate (contaminated surface runoff) accumulated at Cell 1X, 2X, 3X and 4X has exceeded the leachate treatment capacity (daily maximum effluent discharge volume of 1,776 m<sup>3</sup> recorded from 9 October to 24 November 2023, with daily effluent discharge limit of 2,000 m<sup>3</sup> as stipulated in the WPCO license).</p>
Action Taken / Action to be Taken	Examination of environmental performance of the Project will be continued during the weekly inspections. The Contractor is reminded to closely monitor the operating conditions of the leachate collection system (e.g. set alarm when the leachate level reach about 80% of the Limit Level) and pump out the leachate for treatment to avoid any exceedance of the Limit Level.
Remarks	-

Prepared by: Abbey Lau  
Designation: Environmental Team  
Date: 12 December 2023

## Investigation Report of Environmental Quality Limit Exceedance

Project	South East New Territories (SENT) Landfill Extension
Date	7 November 2023
Time	14:40
Monitoring Location	MWX-7
Parameter	Chemical Oxygen Demand (COD)
Limit Level	>36 mg /L
Measured Level	38 mg /L
Possible reason	<p>Groundwater contaminated with leachate is commonly characterized by high COD and ammoniacal-nitrogen levels as a result of degradation of organic matters in the waste. The ammoniacal-nitrogen monitoring result at groundwater monitoring wells MWX-7 (6.53 mg/L) and the COD monitoring results of the groundwater monitoring wells adjacent to MWX-7 (MWX-6: 35 mg/L and MWX-8: 24 mg/L) are well within the respective limit levels. Hence, there is a low possibility of the elevation of COD level at MWX-7 is due to leachate contamination from SENTX operation or at least it is not conclusive to base on these results to demonstrate exceedance was due to leachate contamination.</p> <p>In accordance with Table 4.5b of the updated EM&amp;A Manual, repeat measurement was conducted on 14 December 2023 to confirm findings. COD concentration of 18 mg/L (below the Limit Level) was measured at MWX-7 during the sampling event, which demonstrate no consecutive groundwater quality impact at the monitoring location.</p> <p>According to the findings of the desktop review commissioned by GVL and EPD (the Employer) in May 2021 to investigate the potential sources of the elevated methane levels at the perimeter landfill gas monitoring wells at SENTX, pockets of organic matters are identified in the fill materials of the SENTX site upon review of the historical site investigation borehole logs at the Project Site area. It is possible that the elevated COD concentration measured at MWX-7 on 7 November 2023 could be due to localised organic matters within or around the monitoring well and background fluctuation.</p> <p>Due to the presence of influencing factor from non-project source and the subsequent month monitoring results at MWX-7 did not show any exceedance, there is no adequate evidence showing that the COD level exceedance measured at MWX-7 on 7 November 2023 was deemed to Project-related activities.</p> <p>It should also be noted that although the COD level exceeded the limit level of the EM&amp;A programme, it is still well within the</p>



	<p>WPCO effluent discharge limit of COD (80 mg/L) and the standard for effluents discharged into the inshore waters of the Junk Bay Water Control Zone as stipulated under Technical Memorandum Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (80 mg/L). The slight exceedance of COD at MWX-7 on 7 November 2023 will not cause adverse water quality impact to the Junk Bay Water Control Zone.</p>
<p>Action Taken / Action to be Taken</p>	<p>Examination of environmental performance of the Project will be continued during the weekly inspections. The Contractor is reminded to implement relevant and appropriate mitigation measures according to the updated EM&amp;A Manual to avoid any exceedance of the Action and Limit Levels.</p> <p>ET will continue to closely monitor the groundwater quality monitoring results and collect additional data for investigation and further review, if necessary.</p>
<p>Remarks</p>	<p>-</p>

Prepared by: Abbey Lau  
 Designation: Environmental Team  
 Date: 4 January 2024

## Investigation Report of Environmental Quality Limit Exceedance

Project	South East New Territories (SENT) Landfill Extension
Date	14 December 2023
Time	11:21
Monitoring Location	MWX-6
Parameter	Chemical Oxygen Demand (COD)
Limit Level	>46 mg /L
Measured Level	54 mg /L
Possible reason	<p>Groundwater contaminated with leachate is commonly characterized by high COD and ammoniacal-nitrogen levels as a result of degradation of organic matters in the waste. The ammoniacal-nitrogen monitoring result at groundwater monitoring wells MWX-6 (4.36 mg/L) and the COD monitoring results of the groundwater monitoring wells adjacent to MWX-6 (MWX-5: 28 mg/L and MWX-7: 18 mg/L) are well within the respective limit levels. Hence, there is a low possibility of the elevation of COD level at MWX-6 is due to leachate contamination from SENTX operation or at least it is not conclusive to base on these results to demonstrate exceedance was due to leachate contamination.</p> <p>In accordance with Table 4.5b of the updated EM&amp;A Manual, repeat measurement was conducted on 8 January 2024 to confirm findings. COD concentration of 49 mg/L was measured at MWX-6 during the sampling event. MWX-6 showed consecutive exceedance of groundwater quality limit.</p> <p>According to the findings of the desktop review commissioned by GVL and EPD (the Employer) in May 2021 to investigate the potential sources of the elevated methane levels at the perimeter landfill gas monitoring wells at SENTX, pockets of organic matters are identified in the fill materials of the SENTX site upon review of the historical site investigation borehole logs at the Project Site area. It is possible that the elevated COD concentration measured at MWX-6 on 14 December 2023 could be due to localised organic matters within or around the monitoring well and background fluctuation.</p> <p>Due to the presence of influencing factor from non-project source, there is no adequate evidence showing that the COD level exceedance measured at MWX-6 on 14 December 2023 was deemed to Project-related activities.</p> <p>It should also be noted that although the COD level exceeded the limit level of the EM&amp;A programme, it is still well within the WPCO effluent discharge limit of COD (80 mg/L) and the standard for effluents discharged into the inshore waters of the Junk Bay</p>

	Water Control Zone as stipulated under Technical Memorandum Standards for Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters (80 mg/L). The slight exceedance of COD at MWX-6 on 14 December 2023 will not cause adverse water quality impact to the Junk Bay Water Control Zone.
Action Taken / Action to be Taken	<p>Examination of environmental performance of the Project will be continued during the weekly inspections. The Contractor is reminded to implement relevant and appropriate mitigation measures according to the updated EM&amp;A Manual to avoid any exceedance of the Action and Limit Levels.</p> <p>ET will continue to closely monitor the groundwater quality monitoring results and collect additional data for investigation and further review, if necessary.</p>
Remarks	-

Prepared by: Abbey Lau  
Designation: Environmental Team  
Date: 29 January 2024