



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 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&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&A programme, it is still well within the</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.
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&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: 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&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&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&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

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 m³ recorded from 9 October to 24 November 2023, with daily effluent discharge limit of 2,000 m³ 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